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A Framework for Assessing the Appropriateness of a Customer-centric Strategy and its Outcomes aimed at Improving Product Development and Service Design

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A Framework for Assessing the Appropriateness of a Customercentric Strategy and its Outcomes aimed at Improving Product Development and Service Design

By

Chinomso Nwagboso

A thesis submitted in partial fulfilment of the University's requirements for the Degree of Doctor of Philosophy

September 2018



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Abstract

Research has shown that overall business performance of UK customer-centric companies is falling, and the associated research question that addresses this is 'to what extent can usability serve as a basis for customer-centric strategy measurement to help improve business performance'.

A key task of the research was therefore to construct a framework that would assist managers of customer-centric manufacturing and service businesses, in measuring the appropriateness and outcomes of their strategies for improving product and service design through the use of usability targets. These improvements then have the potential to enhance business performance.

Usability was introduced in the research to determine if it was an appropriate basis for measurement, and if so, how it could be applied for the purpose of strategy measurement. The goal was to help companies ensure that customer-centric strategies are appropriate and properly implemented, and that customer-centric businesses are made aware of the requirements of customer-centricity.

Firstly, a study was conducted to assess the relevance and shortcomings of existing strategic management tools for strategy measurement. The reason for this was to ensure that the framework developed in this work filled the gaps that these models did not address, and to answer research question 1. A number of tools were selected based on the review of literature. Results from a survey completed by 103 managers of manufacturing and service businesses involved in the development and implementation of strategy showed that there were more shortcomings than benefits in using these tools for the measurement of strategies which were aimed at improving product development and service design. Of the 15 tools, the most seemingly appropriate was the Balanced Scorecard because of its evaluation attributes, but however, it could not effectively measure customer experience. As example, the tools do not aid in measuring the friendliness of products or services, or how a business culture for improved customer experience could be enhanced, or if necessary, changes needed in order to deliver the strategy.

Another study was conducted to show the importance of achieving strategic fit to help ensure successful innovation and knowledge management, which were the measures of business performance in this research. Confirmation of this importance informed the framework design such that use of the framework would help enable businesses to achieve strategic fit, answering research question 2. Strategic fit means that internal resources are aligned to meeting the needs of the external environment. In this sense, it means that businesses are using their resources properly for the purpose of effective knowledge management and of innovation. When analysed, results from the survey showed that although they identified threats to their performances, many of these businesses do not properly manage these threats. As a result, they had not been innovative or effectively managing knowledge. Thus, further proved the need for a framework. A Factor Analysis of all the survey results deduced relevant strategies to enable companies to be truly customercentric. The first framework was developed based on usability goals and measures determined from literature. It was then updated by matching these customer-centric strategies to the usability goals and measures to help in achieving the objectives three to five. These objectives related to the development and application of usability methods for strategy measurement, proposing a framework for improving product and service development strategies, and correcting usability problems. This was geared towards answering research question 3.

Data was collected in two phases of usability testing, showing the factors that contribute to improved user experience. The first phase involved 500 user tests of products and services from 20 companies. When analysed using Content Analysis, the sample size was reduced, by selecting the best and worst performing products and services in terms of user experience. For the second phase of the user tests, the Think Aloud Protocol was applied during the observation of 24 participants, and follow up interviews were then conducted with the users. Factor Analysis was used to analyse the observation data, helping in the organisation of data for the framework. The interview data was then analysed with Template Analysis, helping to identify common themes in user responses.

The results from this second phase of the usability study were used in developing the third version of the framework which now had goals, measures, corresponding strategies, and targets. The framework was validated by 32 business managers. The validation process had some important outcomes. It showed that the framework is useful in the strategy implementation phase. It also showed the need for more explanation on usability, as many managers do not usually think of this topic. The validation phase also showed no statistical difference between manufacturing and service businesses in terms of relevance and application of the framework. Also, the managers found it relevant for strategy measurement, easy to use, customer-centric, and helpful in achieving desired outcomes. They also gave some feedback as to what should be improved, and this was reflected in the final version of the framework.

This final version was then tested by three businesses. A University, a retail store, and a furniture manufacturer. The managers were interviewed to gain an understanding of their strategies, so that the strategies could be measured. Their customers were interviewed and were observed using the products and services, and were assessed using the framework. As a result of the test process, company problems with service and product design were found. A number of strategies that had been implemented were identified as appropriate, and these were yielding successful outcomes. The framework confirms and contributes to standards for customer-centricity. The managers found the framework was useful because they were able to see where they had been performing well or underperforming. Managers were able to identify what was working well in terms of customer-centricity, and what areas of their product and service development required improvement.

Managers now have a structure and targets to keep in mind when designing their products or services.

The results from all the phases of the research were collated and an implementation guide for managers was created. It incorporates an updated version of the framework along with definitions, processes, and requirements for its use. Apart from the many benefits and areas of practical application identified through validation and testing, the framework is novel and useful because customers' subjective and behavioural experiences and interactions with businesses, can now be measured quantitatively to show the performance of products and service design strategies, thereby creating the opportunity for business performance improvement.

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Glossary

Attractiveness (Vs Usability): refers to physical appeal of a product, while Usability refers to the degree to which a product or service can be used by specified users to achieve specified goals with effectiveness, efficiency, ease of use, engagement, and error tolerance in a specified context of use

Business Performance: is the result of an organisation activities, showing the extent to which they have achieved their goals

Customer Experience (CX): is a holistic concept that encompasses interactions with every aspect of a company's offering

Customer Experience Index (CEI): is an annual benchmark of customer experience quality among large global brands

Customer-centric: refers to a business that designs its activities around customers to ensure positive customer experience

Customer-centricity (CC): refers to the continuous implementation of a set of customer-centric activities

Customer Relationship Management (CRM): is an approach to managing interactions with current and potential customers

Durability (vs reliability): durability refers to the long-lasting nature of products, whereas reliability refers to the dependability of the product

Effectiveness: refers to the completeness and accuracy with which users achieve specified goals

Efficiency: refers to the speed by which users can complete tasks for which they use the product

Error Tolerance: means designing products and services to prevent errors caused by the user's interaction, and to help the user in recovering from any errors that do occur

Entrainment: is the alignment of internal resources to effectively meet external environmental needs. The same as strategic fit

Ergonomics: is the application of psychological principles to the design or engineering of products, processes, and systems

Goal: is a desired result

Innovation: is the development or modification of a new or existing product, process, or service

Information system: is an integrated process consisting of hardware, software, and networks that enable the flow of information throughout an organisation

Knowledge Management (KM): means effectively creating, using, sharing, reusing, and storing knowledge

PACT Analysis: is a process that involves the identification of People, Activities, Contexts, and Technologies for the use of a product, system, or service

Process vs Strategy: a process is a series of steps taken to achieve a result, where as a strategy is a plan of action designed to achieve a long-term or overall aim

Product development: is the modification of an existing product or formulation a new product to satisfy customer needs or market niche

Service design: means planning and organising resources in order to improve the quality and interaction between a business and customers

Strategic fit: is the alignment of internal resources to effectively meet external environmental needs

Strategy (vs framework): a strategy is a coordinated set of actions to fulfil objectives, purposes, and goals, whereas a framework is a structure around which a strategy can be managed

Strategy Development: means generating a set of alternative plans from the process of researching a business and environment within which it operates in order to achieve its objectives

Strategy Measurement: compares organisation strategy to standards or goals set, looking at the outcomes or appropriateness

Think Aloud Protocol (TAP): is an exploratory research method to examine how consumers react to a stimulus, e.g. A product, website or leaflet. Participants are asked to 'think aloud', i.e. To concurrently verbalize aloud their thoughts, feelings and associations during user-tests

Usability: is the extent to which a product or service can be used by specified users to achieve specified goals with effectiveness, efficiency, ease of use, engagement, and error tolerance in a specified context of use

User Testing: refers to the observation of real behaviours from a sample of users to measure the usability of a system, product, process, or service

User-Experience (UX): refers to people interacting with a product and the experience they receive from that interaction

Chapter 1: Introduction

1.1 Introduction

The development of generic strategy measurement techniques is applicable to all manufacturing and service companies, which to varying degrees, are experiencing ever-increasing business threats and global competition. Therefore, a significant field to undertake research in the engineering management area which up until now has concentrated more on applied research. This thesis is focused on the development of a generic strategy measurement technique, founded on the principles of Usability. The research seeks to address the question 'to what extent can usability serve as a basis for customer-centric strategy measurement?' This chapter provides a background, purpose, and the significance of the thesis.

1.2 Background

A business strategy as defined by Lynch (2012) is a set of plans implemented by an organisation to achieve desired objectives. Strategy measurement therefore can be interpreted to mean the assessment of the results derived from the implementation of these plans, or the suitability of the plans as the case may be. A successful result of a strategy would logically be determined by the extent to which the outcomes help deliver goals set by the business, and the strategy would therefore be appropriate if it can meet the standards required to achieve the goal. One of the goals of manufacturing and service businesses is usually to ensure that their customers have positive experiences with the products and services provided by the business. Markgraf (2017) describe the strategies needed to achieve these goals as 'Customer-centric' strategies.

Customer-centric companies according to Manuri (2015) aim to provide positive customerexperience at all points of interaction with the organisation- before sales, during sales, and after sales. Following the logic of a strategy being appropriate if it meets certain standards required to achieve the main business goal, a customer-centric strategy is appropriate if it works on all stages of interaction between businesses and customers. A customer-centric strategy will then be considered successful when it aids the provision of positive experiences, leading to customer loyalty and retention. Appropriateness and outcomes of customer-centric strategies can therefore be measured on the basis of customer-experiences at stages of interaction with the business. Understandably, it would be easy to conduct surveys for this assessment; however, 'experience' is relatively emotional or behavioural and would therefore require a more relatable method of assessment. For this reason, User-testing is being proposed as a suitable form of assessment, as it involves methods that enable other researchers to gain better understanding of the mind-set of users towards a product or service. User-testing is a Usability method that not only enables behavioural assessments of, but also aims at improving user-experience products (Ward 2013). Improving user-experience is the goal of usability (Bevan et al. 2013), and also a factor of customer-experience (Morgan 2017). Customer-experience refers to the overall interaction with the business (Shenoy et al. 2012), while user-experience occurs at single units of interaction with products and services, thereby forming an overall customer-experience (Aalto et al. 2017, Cao 2017, Quesenbery 2004). This relationship makes user-experience measures appropriate in assessing overall customer-experience. This thesis seeks to prove that by improving user-experience of digital and non-digital products and services, customer-centric strategies can be successful.

It further calls attention to the significant relationship between customer-experience and userexperience. However; there is very little literature linking respectively, customer-centricity to usability. The research therefore seeks to determine the extent to which usability can be applied in measuring customer-centric strategies, forming the broad research question of this thesis. This research is of academic importance because it bridges this gap in helping deliver improved product development and service design. It also addresses the practical aspects of building on an information system in a novel way customer-experience management, usability, and business intelligence in manufacturing and service companies, thereby better enabling management to make more informed strategic decisions with the outcome of improved customer-experience. Informed strategic decisions reduce the chances of developing inappropriate strategies, which can lead to unsuccessful outcomes. The customer-experience index (CEI) by KPMG (2017) shows a steady fall in performance of customer-centric organisations in the UK over 3 years (2014-2017). This research seeks to determine if the fall in performance results from the development and implementation of inappropriate strategies, mindful that customer-experience has not been linked in literature and possibly practice to the principles of usability. The research also seeks to identify user-experience targets required to ensure that customer-centric strategies help in improving product development and service design in manufacturing and service companies.

The thesis has novelty because it seeks to link environmental drivers and strategy development processes with the development of a conceptual strategy measurement tool that can be integrated into management processes to aid strategic performance management. The strategy measurement process and framework are validated in manufacturing and service organizations.

1.3 Research Questions

The broad research question is 'to what extent can usability serve as a basis for customer-centric strategy measurement to help improve business performance?' The specific research questions are:

- 1. How effective are existing strategy measurement processes and tools in improving service design and product development?
- 2. How does strategic fit influence the success of an innovation and effectiveness of knowledge management, which serve as the basis for business performance?
- 3. How can usability methods be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience?

1.4 Research Aim and Objectives

The aim of the research is to construct a framework for assessing the appropriateness of customercentric strategies in manufacturing and service organisations, and their outcomes, through the application of Usability measurement to enable improved customers' experiences with products and services, enhancing business performance.

The objectives of the research are to:

- Examine the relevance and shortcomings of existing strategy measurement processes and tools in improving service design and product development in manufacturing and service organizations;
- 2. Evaluate the impact of strategic fit on successful innovation and effective knowledge management as the basis for business performance;
- 3. Propose and apply Usability methods in assessing appropriateness and outcomes of strategy in order to help enhance products and services for improved user experience.
- Propose recommendations and a framework for improving product and service design strategy, and;
- 5. Facilitate improved strategy delivery through developing an approach for correcting Usability problems found in products and services.

1.5 Usability and the Product Design Lifecycle

This research adopts the definition of Usability by Quesenbery (2004), as the extent to which a product or service can be used by specified users to achieve specified goals with effectiveness, efficiency, ease of use, engagement, and error tolerance in a specified context of use. The concept of usability is traditionally based on the 'ease of use' of user interfaces (Nielsen 1994).

Studies (Benyon et al. 2005, Nielsen 1994, Sauer et al. 2010, Scott et al. 2012) on usability are mostly done on products rather than services. Most definitions, tests and usability evaluations, if not all, are on products. It is possible that the term 'product' is used to describe services as well. However, this is not specified in literature, except few studies (Mesing 2016) that emphasize service design. To fill this gap, this research considers both product and service usability.

Usability grew from being a Human Computer interaction (HCI) dominated concept in the 1980s, to concentration on quality in use, to user-experience (Benyon et al. 2005). Nielsen (1993) explains that the paradigm shifts of usability, resulted from globalisation by broadening the device market, personalisation by customizability for each user, and interoperability expecting all devices to work together. Considering the micro economy, for companies unable to compete on patents or price, usability has become more than HCI efficiency, to a method of gaining competing advantage (Benyon et al. 2005). Though usability is an operational concept, when applied to gain competitive advantage, it becomes a strategy, following the definition of a strategy by Robson (1997), and as such is required to yield expected successful usability outcomes.

Since usability now concentrates on improving user-experience, as stated by Benyon et al. (2005), it is expected that when implemented, improved user-experience should be the outcome. User-experience occurs at multiple units and stages of a business system for product or service design, adding to overall customer-experience. These units or stages range from product sale and acquisition, to product use, and after sale support. Therefore, the theory being proposed is that to achieve user-experience outcomes, an appropriate strategy consisting of user-experience targets must be developed and implemented. However, Bonacchi and Perego (2011) finds that there is a lack of literature on implementing and measuring the success of strategies related to achieving improved customer-experience through improved product and service design.

Improved product and service design logically translates to a better-quality or enhanced service and product. According to Lim (2006), improvement involves the development or regular modification of existing products or services. This research suggests a relationship between customer-centricity and product and service development/design. Therefore, improvement would need to reflect better factors incorporated in the design process, which should ultimately lead to enhanced customer-experience.

Furthermore, an improvement in product development and service design could lie in the improved quality of knowledge management and innovation processes in companies, rather than the intensiveness, which was also argued by Mazur and Strzyzewska (2010). This research suggests that innovation is the factor that links usability and knowledge management.

This is because usability and knowledge management are individual drivers of innovation. Essentially, improving the design of the product or service requires an improvement in the development process as shown in figure 1.1.



Figure 1.1: Product Life Cycle Management Model- Typical Stages (Jamnia 2018)

The place of usability in the design cycle lies in the design and verification and validation in the new product development phase, and; throughout the product sustaining phase. This research identifies user-centred processes appropriate for measuring the relevance and outcomes of strategy measurement processes, alongside scenarios in which they are best applied, the actual process used, and where they are appropriate and inappropriate. By evaluating the extent to which usability testing methods can be applied in the strategy development and measuring the relevance of strategy, keeping in mind changing environmental drivers, it seeks to discover if knowledge gaps exist in the applicability of usability testing methods as strategy development and measurement tools.

Therefore, strategies developed and implemented for improved product development and service design should meet certain usability criteria on which its appropriateness and outcomes can be assessed. The development strategy should essentially provide competitive advantage, meet success factors, ultimately meet business objectives, and be the right fit for the dynamic environment, consider the resources required for implementation, consider organisational culture, be simple, and consider change demand. This will enable the development and design of products and services that provide positive customer experience.

This research seeks to assess the extent to which the existing strategy measurement processes and tools implemented to achieve these are effective, and how usability can fill the gap, through targets and usability-testing.

1.6 Significance of the Research

The final output of the research is a data-driven conceptual framework based on evidence, illustrating how Usability can be applied in measuring customer-centric strategies, to improve product development and service design. The framework represents a strategy measurement system, consisting of user-experience targets that translate to required customer-experience outcomes, thereby enabling customer retention and even improve the chances of acquisition, which could lead to enhanced profitability. Significantly, the framework sets out to measure the appropriateness and outcomes of customer-centric strategies, thereby:

- Facilitating the adoption of proper measurement processes and tools;
- Facilitating the proper alignment of internal resources for successful innovation and knowledge management;
- Facilitating the enhancement of products and services for improved user-experience;
- Facilitating the improvement product and service design strategies, and;
- Improving product and service delivery in manufacturing and service businesses.

Concepts from literature were improved on based on data collected, and applied to the model. The framework is not a solution to poor customer-centricity. It is a guide towards the identification of poor customer-centric activities. However, regular assessments of business strategies based on user-experience could lead to improved strategy results. Considering that customers are made a significant part of the strategy measurement and change process, it could make the company and more innovative with their designs and business processes. This is because it is more than likely that user tests could bring about innovative processes, products, and services. The quality and intensity of knowledge management will be improved over time, ensuring the reuse of knowledge in processes, and addressing customers' needs. Rather than applying basic marketing methods of obtaining customer responses through surveys and focus groups, the application of usability methods not only requires diverse groups of customers to be recruited and observed while they make use of the products or their prototypes, but also for these customers to voice their opinions (think aloud) while they make use of the products.

More importantly, it could enhance customer satisfaction, and increase customer base, owing to the customer-oriented strategies of the company. Therefore, this should lead to improved profit based on increase in sales over time.

1.7 Research Scope and Activities

The research scope and activities are highlighted and justified in table 1.1 below. The table also shows the chapters in which the activities can be found in the project.

	Activity	Justification	Section
1.	Evaluate changing business environmental drivers and their association with business performance	To identify environmental factors that affect successful innovation and effective knowledge management in manufacturing and service organisations	
2.	Evaluate the impact of changing business environmental drivers on strategy development processes	To determine how these factors, affect the development of user- centred business strategies	
3.	Evaluate the relevance, value, and shortcomings of existing strategy measurement tools	To determine the areas in which current strategy measurement tools are lacking in the improving the implementation of appropriate strategies, and measurement of outcomes of strategies.	Chapter 2:
1.	Evaluate the concept of usability and the extent to which it can be applied in measuring the relevance of strategies	To provide a background to usability, its techniques, and principles, for the development of the template for data collection.	Literature Review
2.	Setting the research focus on customer-centricity, and differentiating between user- experience and customer- experience	To give the research a better focus and direction. To show the role of usability, through user-experience, in achieving customer-experience goals.	
3.	Identification of sub-strategies that make up customer-centricity, and the linking of user-experience targets to customer-centric strategies.	To show the relevance of usability principles in strategy measurement, and the connection.	
1.	First version of the strategy measurement tool appropriate for enhancing business performance. The identification of usability goals and targets based on review of literature, relevant for improving customer-experience.	To have a template for data collection through user tests and interviews	Chapter 3: Methodology
2.	Sector selection, questionnaire sampling, user testing sampling, and validation sampling	To gain focus, statistical validity, representation, and relevance.	-
3.	Questionnaire distribution and analysis on innovation	To assess the innovative practices in organisations, and the relationship with customer-centricity.	Chapter 4: Data Gathering,
4.	Questionnaire distribution and analysis on knowledge management	To assess the knowledge management practices in organisations, and the relationship with customer-centricity.	Analysis, and Evaluation of Survey Data
5.	Questionnaire distribution and	To determine the level of inclusion of	

Table 1.1: Scope of Research Activities and Justifications

	analysis on strategy development	user-experience targets in the	
6.	Questionnaire distribution and analysis on strategy measurement	To gain organisational perspective on existing how existing strategy frameworks consider essential user- experience targets.	
7.	Financial representation of conceptual framework using organisations from the top 100 customer-centric organisations based on CEI by KPMG	To prove that the combination of the sub-strategies put together in the conceptual framework developed in this research makes up the profit of customer-centric organisations	
8.	Assessment of the relationship between performance of customer- centric organisations and industry standard of profitability	To prove whether customer- centricity guarantees profitability	
9.	PACT analysis	For user-test task development, product selection, and interview questions	
10.	User observation	For scoping the sectors for data collection. To reduce the bulk of the work for data collection, in order to collect detailed content for analysis.	
11.	User interviews	The main method of data collection, to gain users' perspective on constituents of good customer- experience.	Chapter 5: Data Gathering, Analysis,
12.	Modification of conceptual framework based on user interviews	To achieve the aim of the research, of developing a conceptual framework for measuring customer- centric strategies.	User-Testing Data
13.	Assessment of feasibility of user- experience targets in strategy development	To provide a solution to a major problem found in literature, helping organisations incorporate a customer-centric mind-set and avoid the development and improvement of inappropriate strategies.	
14.	Validation of conceptual framework	To ensure the conceptual framework is relevant to manufacturing and service organisations and can measure the relevance and outcomes of customer-centric strategies.	
15.	A trial of the framework	To ensure it is applicable and prove its use in manufacturing and service companies	Chapter 6: Validation and Testing
16.	Make the final version of the conceptual framework into a spreadsheet	Ease of use of framework for strategy measurement	
17.	Summary of the project findings	Provide a conclusion to the project	Chapter 7:
18.	Suggestions for further studies	To show potential areas for research in this area od studies	Conclusion

1.8 Summary

Strategies based on user-experience are vital for successful business performance, particularly in customer-centric organisations. When customers have positive experiences with products and services, it usually leads to customer retention, loyalty, acquisition, and revenue. Poor experiences however drive customers to the competition—eventually, making a product and service offering unviable. Organisations these days have become customer-centric to avoid losing their customers. However, there is the need for appropriate targets for the development and implementation of these customer-centric strategies. Usability methods are relevant, as they are applicable in any system or area of business. Though usually limited to product design, they can be applied in the development of services, and systems.

To answer the broad research question 'to what extent can usability serve as a basis for customercentric strategy measurement to help improve business performance?', this research sets out to discover the targets that need to be considered when measuring the appropriateness and outcomes of these user-experience strategies, which have been found to be customer-centric strategies. The research also seeks to give a balance to products and services as part of ergonomics and industry design. The research sets out to propose a framework with a robust format for strategy measurement for customer-centric manufacturing and service organisations.

The review of literature in the next chapter is the first step to answering the research questions 1-3. In the next chapter, existing strategy tools are examined to determine gaps that can be filled by usability methods. This helps in answering the first research question by evaluating, based on literature, how effective existing strategy measurement processes and tools are in improving service design and product development. The literature review also seeks to answer the second research question, by evaluating how strategic fit influences the success of an innovation and effectiveness of knowledge management, which serve as the basis for business performance. The next chapter also provides case studies showing that usability techniques can be applied to any type of company, with similar processes, even with their different products. The goal is to determine how usability methods can be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience.

Chapter 2: Literature Review

2.1 Introduction

In order to determine the extent to which usability methods can be applied in measuring customercentric strategies, it is important to review literature that will help in answering research questions 1 and 2. In sections 2.1 to 2.5, literature is reviewed to answer research question 1: how effective are existing strategy measurement processes and tools in improving service design and product development? According to De Rond and Thietart (2007), managers tend to select strategic management tools based on intuition, and these tools might not always be appropriate for the situation being assessed. It is therefore important to examine the application of decision process in selecting strategic analysis tools for strategy measurement.

First, a distinction is made between strategic analysis, strategy development, and strategy measurement, leading to the identification and selection of strategic analysis tools appropriate for measuring the relevance and shortcomings of a given strategy, or that can be retrospectively applied for the purpose. The review then examines the objective choice of strategy measurement tools, critically analysing decision support techniques aimed at aiding choice processes. Criteria would then be developed for the selection of strategic analysis tools considered and decision support tools as well. These criteria are applied in selecting the tools used in the subsequent studies. The effectiveness of these tools is assessed, in order to answer the research question.

Sections 2.6 and 2.7 include a review of literature to answer the second research question: how does strategic fit influence the success of an innovation and effectiveness of knowledge management, which serve as the basis for business performance? Changes in different aspects of global business environment present companies with opportunities and threats, which influence their operations and survival (Efrat and Shoham 2012). These environmental drivers are categorized by researchers (Efrat and Shoham 2012, Dibrell et al. 201, Lisboa et al. 2011, Mazur and Strzyzewska 2010) as factors that impact successful 'Innovation' and effective 'Knowledge management', and therefore should be considered in strategic management and decision making. Therefore, good business performance in this globalized era can be characterized by successful Innovation and effective Knowledge management in organizations (Karagiannopoulos et al. 2011).

Based on this, internal and external drivers of business environment are identified in this review, aiding the evaluation of their individual impacts on business performance. This is necessary, because critical understanding of the business environment helps in achieving strategic fit, which is the basis of this section of the research. Effective management of environmental drivers of business performance can help in the development and implementation of strategies (based on usability targets) that respond positively to opportunities, by exploiting their internal resources and competencies efficiently, leading to strategic fit (Marr et al. 2004).

The third research question 'how can usability methods be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience' is also addressed in this review. The review identifies user-centred processes relevant to measuring the relevance and outcomes of strategy measurement processes, alongside scenarios in which they are best applied, the actual process used, and where they are appropriate and inappropriate. By evaluating the extent to which usability testing methods can be applied in the strategy development and measuring the relevance of strategy, keeping in mind changing environmental drivers, it seeks to discover if knowledge gaps exist in the applicability of usability testing methods as strategy development and measurement tools. The angle it is being looked from is that Usability bases strategy on user-experience, therefore the development and measurement of strategy could be based on user-experience.

2.2 Strategy Analysis vs Strategy Measurement

According to Churchova et al. (2016), strategic management involves creating and implementing long term development projects, significantly important for the achievement of organisational goals. Strategic analysis is an area of strategic management (Termiya and Aodona 2014), which basically involves the process of developing strategies for a business by researching the business and environment within which it operates in order to achieve these objectives (Turkay et al. 2011). Strategy measurement however compares organisation strategy to standards or goals set (Kaplan and Norton 1996).

For clarity and by way of summary, the difference between strategic analysis and strategy measurement lies in the fact that strategy measurement looks at the results or outcomes obtained because of the strategic analysis (Lynch 2012). Strategic management therefore considers an organisation's ability to understand its resources and environment (White 2004). In the process of strategic management, strategic analysis occurs in the evaluation of environment and resources leading to the development of strategy (Rao and Subba 2010). Lynch (2012) states that there is no single process to strategic management, further describing two perspectives of strategic management: Prescriptive, and Emergent Approach as shown in figure 2.2.

The prescriptive approach according to Lynch (2012) involves generating strategic options, and rational selection based on strategic criteria. Strategic measurement occurs in the rational selection of a strategic option to ensure appropriateness, and in the evaluation of results of the strategic option to ensure successful outcomes.

Criteria for appropriateness of a strategic option according to Lynch (2012) include:

- Consistency with business mission and objectives;
- Suitability for environment and resources;
- Validity to ensure the assumptions that form the basis of the option are well grounded;
- Feasibility of option in terms of culture,
- Internal resources,
- Competitive reaction,
- Commitment from managers and employees;
- Business risk such as exposure to hazard or danger, and;
- Attractiveness to shareholders.

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Figure 2.2: The Prescriptive Versus Emergent Strategic Purpose (Lynch 2012)

Churchova et al. (2016) go further to explain that strategic management is a continuous process, whether the prescriptive or emergent approach is taken.

Johnson and Scholes (1997) and Robson (1997) agree with this. Churchova et al. (2016) further illustrates that the strategic management cycle involves analysing company strategy at corporate level first, then at business level, after which the strategy is selected, implemented, and controlled, leading to strategy for a new period. Based on this cycle, the outcome of this review plays a role in determining the extent to which usability testing methods can be applied in Manufacturing and Service companies to assist in the measurement of the appropriateness and outcomes of strategies to improve business performance and help enhance global competitive advantage and business outcome. It is therefore important to examine strategy measurement and its requirements, to show where usability methods can be introduced.

2.3 Strategy Measurement

A strategy measurement tool should combine the benefits of numerical analysis within the descriptive scope of qualitative measures (Schwarz 2012). Johnson and Scholes (2005) who discuss the involvement of strategy measurement in the process of strategic analysis, state that in order to ensure business performance and competitive advantage, strategy measurement should take into consideration the organisational purpose, the dynamism of the environment, and resources and competences of the company. According to Johnson and Scholes (2005), this enables the business to achieve strategic fit. Similarly, Kay (1994) believes that the internal capabilities of an organisation, and the external relationships should be considered.

Interestingly, to measure the extent to which these goals or targets are achieved, some companies still make use of just traditional performance measures, by only measuring short-term profitability (Bastin and Muchlish 2012). However, authors such as Johnson and Scholes (2002), Pearlson and Saunders (2010), and Robson (1997) have emphasised the need for understanding external relationships, and dynamism of the environment in analysis, and the importance of determining the success of a strategy based on these. In fact, according to Johnson and Scholes (2005), since strategy measurement is involved in strategic analysis, the dynamism of the environment seems to be the major basis of strategy measurement. This research considers customer-centric strategies, of which customers are the primary concern. Considering the business environment as suggested by these authors, the customers should therefore be the basis of measurement.

When a company understands the needs of customers contrasted against current strategy, using strategy tools, and has properly measured its resources and competences against its purposes with relevant strategic tools as well, then can it make new choices on strategy, and implement these choices (Collin 2004).

This research suggests usability testing as a method for understanding the needs of customers, in order to ensure that the strategies implemented to improve customer experience, incorporate to a large extent the requirements of customers and therefore yield suitable outcomes. According to Johnson and Scholes (1993), to choose appropriate strategy, the process involves the generation of suitable options, evaluation of these options, selection, and implementation of a strategy including already existing strategy. This research suggests the consideration of usability methods, processes, and principles through all these stages of strategy management.

This thesis considers that strategy measurement occurs before implementation and after implementation of the strategy, and suggests the introduction of usability measurement in these phases. Strategy measurement is closely linked to strategy development in two significant ways. After a strategy is developed using relevant tools, it can be measured for appropriateness using devoted strategy measurement tools, or using the same strategy development tools.

It is possible that strategy measurement can be carried out, without being identified as strategy measurement, since it is not a popular concept like strategy development. Quite a few strategic analysis techniques are used by organisations for strategy measurement, knowingly or unknowingly, and due to the large number of strategic analysis techniques that exist (Pearlson and Saunders 2010) as can be seen in appendix 6, not all of them can be reviewed in this research. For this reason, the criteria for selecting the few tools considered in this review are first described before they are chosen. Furthermore, literature on measuring the outcomes of customer-experience strategies however identifies more of financial and operational ratios, rather than models and frameworks. These ratios simply assess outcomes like retention rate, churn rate, customer lifetime value, and revenue per experience, customer equity, lifecycle status distribution, early repeat rate, overall repeat rate, win-back rate, and leaky bucket ratio. However, a framework takes a holistic view of the user-experience needs from products and services, provides metrics for relevant outcomes, and ultimately provides targets for the organisations to meet these customer-centric outcomes. Balogun et al. (2003) and Huff et al. (2010) however identify the need for more innovative and creative methodologies for better strategic management, which justifies the involvement of usability to strategic management.

2.4 Applying Strategic Analysis Tools in Strategy Measurement

According to Flitman (1994) and Mintzberg (1993), measuring the success of a strategy has been of major problem for many practitioners and academics; however, according to Hastings (1996), not much has been done about it. Hastings (1996) found many firms traditionally evaluate strategy through purely quantitative methods, such as financial ratio analysis, time series analysis and operations research models.

These methods have been criticized widely on the basis that they measure in terms of financial return (comparative or actual) and not in terms of achievement of the goal of the firm. Strategies should be measured based on how successful they were in meeting the goal of the business (Flitman 1994; Myers 1984; Shapiro 1992). In other words, existing strategy measurement processes measures quantity of earnings, for instance in terms of revenue made from sales of a product, but not the quality of earnings in terms of experience provided from the use of said product. The existing methods typically reward short-term value creation and give little thought to the long-term effect on the firm because in the long run, good experience guarantees customer loyalty, which has a positive relationship with profit making.

An organisation seeking to provide improved customer-experience should use a measurement process that measures the quality of the experience they provide to their customers, rather than the earnings from sales. There is a need to analyse the performance of financial and non-financial outcomes of strategies (Dye 2004). Managers are typically uncertain about which of their possible actions creates value, and hence do not know on which tasks to concentrate their attention (Dye 2004). Strategic thinkers can ensure the quality of the strategy by evaluating it before it is implemented, because poor strategic decisions could lead to negative outcomes for businesses that could be difficult or impossible to reverse (David 1993).

It is essential that a strategy be evaluated as early in the strategy process as possible, then strategy can be rejected if it is seen to be inherently bad, inappropriate, or less beneficial than an alternative strategy (Flitman 1994). Considering this, Micheli and Manzoni (2010) argue that strategic analysis can be both functional and dysfunctional for organisations. On one hand, considering that the design of a strategy measurement system and the definition of its roles determine its success and impact on business performance (Jeyarathmm 2008), careful consideration of characteristics and roles in strategy measurement systems will make a substantial contribution to the achievement of organisations' strategic goals (Micheli and Manzoni 2010). The dysfunctional aspect on the other hand was identified by Micheli and Manzoni (2010), stating that strategy measurement techniques stifle innovation and learning in organisations, and has little effect on the decision-making process.

This assertion was based on a research of the benefits, limitations, and contradictions of strategic performance measurement. Whether the effects are positive or negative, Wright et al. (2013) assert an undeniable fact that strategic measurement is indispensable for business performance and competitive analysis. Similarly, Collin (2004) see mostly the positivity in strategy analysis, as it is considered crucial for business and survival. For instance, Fred (2003), states that the process of determining strategic position enables an organisation to achieve its objectives. Strategy management is an integral part of this process.

Porth (2003) also adds that strategy management enables organisations to define and achieve their mission, and ultimately create value. Considering both views to the roles played by strategy measurement in businesses, Micheli and Mazoni (2010) pose an important question, asking how businesses and can make strategy measurement more of an asset and less of a liability. It is possible that to make innovation and learning less rigid for customer-centric businesses, strategy measurement could be based on usability testing for improved user-experiences. This research seeks to show how usability principles can be applied to this effect. However, it is important to first identify the gaps that exist in existing strategy measurement tools, in order to show how they can be addressed by usability. In the following subsections, strategic management tools are selected for review to identify these gaps.

2.4.1 Objectively Choosing Strategic Management Tools for Strategy Measurement

As has been recognised by several authors (Bastin and Muchlish 2012; Collin 2004, Jeyarathmm 2008; Johnson and Scholes 1993; Pearlson and Saunders 2010; Robson 1997), strategy gives organisations direction. Strategy measurement therefore helps organisations define, redefine, and achieve their strategic objectives, and, ultimately, have a positive impact on organisational performance (Micheli and Manzoni 2010). Considering the benefits, Rao and Subba (2010) point out the importance in deciding what strategy tools or techniques are to be used in order to achieve these objectives.

Strategic management tools serve different purposes, and are not applicable to the same experiences, scenarios, or problems (Rao and Subba 2010). These tools can be applied in achieving different strategy management goals. Teryima and Aondona (2014) suggest that strategic choices are based on subjective decisions involving objective information. However, Kazmi (2011) suggests that making a choice from alternatives require objectivity based on setting criteria by which the acceptance or rejection of alternatives will be based, making strategic choice an objective process as well. Considering the classification of strategy analysis tools by Robson (1997), and Johnson and Scholes (1993), certain strategy measurement and development techniques are to be chosen from the wide range of tools that exist (Pearlson and Saunders 2010) for this research.

Making this choice should be based on an objective and systematic process, considering the objective and systematic nature of strategy measurement (Kogut 2011). However, systematic processes are not always used (De Rond and Thietart 2007). This is possible because managers make the choices based on feelings and intuition. De Rond and Thietart (2007) argue that strategy is based on chance, which influences the survival of organizations.

Similarly, Bertrand and Mullainathan (2001), Cattani (2004), and Denrell et al. (2003) argue that strategy is also developed by chance most times, based on circumstance.

These authors do not ignore the role choice has a role to play (if any) in the decision process of determining appropriate strategy measurement techniques, but argue that choice is insufficient, because it is a background-dependent factor just like chance. This takes the argument back to the need for choice to be based on objectivity. De Rond and Thietart (2007) also point out the relevance of causation, the relationship between cause and effect. Based on causation, De Rond and Thietart (2007) developed the conjecture illustrated in figure 2.3 below.

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Figure 2.3: Strategic Choice, Chance, and Inevitability (De Rond and Thietart 2007)

It shows that choice is insufficient to account for strategy. The causal background is a necessity for choice and chance, which are both insufficient, and as such depend on the combination with the causal background- which is the social and material context of the situation, to produce strategy. This implies the need for a structural technique for evaluating effects of chance, and basis for choice in determining and developing strategy. De Rond and Thietart (2007) propose the question, where does the role of causal background end and strategic choice begin? The significance of this question lies in the fact that the changing business environment threatens organisations with casual background, limiting the simplicity and application of objective choices. Covey and Lovie (1998) believe strategic decision should depend solely on judgement and choice through structural analysis, or process tracking techniques which are objective. Ghemawat and Levinthal (2008) state that some choices depend on other choices. Being objective in choosing strategy measurement tools requires consistency in decision making and depends on priorities, multiple choices, and reducing alternatives using inclusion and exclusion strategy (Kogut 2011).

A number of decision support methods are reviewed in the next section to determine the most suitable for selecting strategic management tools.

2.4.2 Decision Support Models for Objective Choice Making

The IFM (2016) identifies decision support tools or techniques that analyse or help narrow the field

of choice in a decision making process. They include but are not limited to:

- Analytical Hierarchy Process;
- Conflict Analysis;
- Criteria Rating Form;
- Weighted Ranking;
- Gap Analysis; Importance / Performance Matrix;
- Quantitative Decision Making;
- Strategic Assessment Model;
- Strategic Assumptions Surfacing and Testing, and;
- Strategic Choice Approach.

Sasty (1980) explains that Analytical Hierarchy Process (AHP) is a tool for making decision in a complex situation. The tool however is complex to use. It is applicable to very serious decision cases, especially those that are difficult to quantify. The conflict analysis according to the IFM (2016) is also a very complicated tool, and although it may have major impacts, it is too complex for simple decision processes. It involves measuring potential conflicts in a situation and could be based on performance measures as shown in figure 2.4.

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Figure 2.4: Conflict Analysis sample (IFM 2016)

The Criteria Rating Form, Weighted Ranking (Chang and Niedzweicki 1995) involves listing all possible alternatives, brainstorming decision criteria, determining the relative importance of each criterion, establishing a rating scale, rating the alternatives, calculating the final score, and selecting the best alternative. As shown figure 2.5, the tool is easier to use compared to AHP and conflict analysis. The criteria rating form can be used for objective decision making, especially when there are several alternatives to be picked from, and when there is dispute within teams in decision making.

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Figure 2.5: Criteria Rating Form (Chang and Niedzweick 1995)

Gap Analysis (IMF 2016) however, unlike criteria rating form is not an objective technique. The gap analysis is concerned with bridging the gap between the present state, and the expected state. The Importance Performance matrix however is an objective tool (Slack 1994), which weighs choices based on their importance and performance. Figure 2.6 shows a 9by9 representation of an importance performance matrix.

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Figure 2.6: Importance Performance Matrix (Slack 1994)
Quantitative decision making by Richard (1984), is also objective in nature like the importance performance matrix, decision making involves stating objectives, identification of all alternative courses of action, and calculable measures of benefit of the various alternatives.

Events beyond the control of the decision maker should also be identified, as well as uncertainty concerning which outcome or external events will happen.

The strategic choice approach is based on a similar process to the quantitative decision making method described by Richard (1984). According to Friend (1992), Strategic choice is viewed as an ongoing process in which the planned management of uncertainty plays a crucial role. Friend and Hickling (1987) state that it involves a process pf shaping the problem, designing, comparing, and choosing as shown in figure 2.7.

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Figure 2.7: Strategic Choice Approach (Friend 1992)

The strategic assessment model (Tavana and Banerjee 1995:1) however involves "decomposing a strategic problem into clearly defined components in which all alternatives, factors, weights, and probabilities are depicted. Next, objective information and subjective judgements of experts are integrated by utilising several methods of problem structuring and information processing." According to Forman et al. (1990:1), "this decomposition and evaluation is not intended to replace the Decision-makers, rather, it provides a systematic approach to support, supplement, and ensure the internal consistency of their judgements through a series of logically sound techniques."

2.4.3 Assessment of Decision Choice Models to Enable the Selection of Strategic Analysis Tools for Strategy Measurement

The criteria for selection include the following:

- 1. Simplicity- the decision making model should not be complex
- 2. Objectivity- the decision making model should be based on an objective process
- 3. Sufficient- the decision making model should be able applicable in the selection of strategic tools without depending another model
- 4. Flexible- the model should not be too restricting or too broad
- 5. Relevance- the model should be relevant to the nature of the problem, which in this research is the selection of strategy management tools for strategy measurement

Tools with the same ranking are first chosen based on highest relevance value, then objectivity, then sufficiency, then flexibility, then simplicity. Based on the assessment, which can be found in table 2.2, the strategic choice approach was chosen for the purpose of selecting suitable strategic management tools for measuring strategies. Its application is explained in section 2.4.4.

	DSS Tools	Simplicity	Flexibility	Objectivity	Sufficiency	Relevance	Score	Choice
1.	Analytical Hierarchy Process	1 AHP is a very complex method, meant for very complex decisions. The level of complexity is too much for selecting a strategy measurement tool.	1 AHP is based on ranking and weighting in matrix. It involves clustering choices based on common characteristics and might miss relevant characteristics when grouping them.	5 AHP is a very objective process based on raking and weighting.	5 AHP is sufficient in selecting a strategy measurement tool.	2 The nature of AHP is not quite relevant to the problem, which is to identify the most appropriate tool for making decisions on strategic analysis tools.	14	7
2.	Conflict Analysis	2 Though Conflict Analysis compares 2 performance measures based in certain criteria, the matrix is quite difficult to use and understand.	1 With conflict analysis, the criteria for assessment are just 2 performance measures.	5 The Conflict Analysis method is objective as it is based on matrix assessment of measures.	3 Conflict Analysis is not sufficient for selecting strategic tools, as it is just based on 2 measures, and will require further analysis and might be time consuming.	4 Conflict Analysis method is relevant to the need of this research, as it is objective, and can applicable in selecting strategic tools.	15	5
3.	Criteria Rating Form, Weighted Ranking	4 The CFR tool is moderately simple to use and easy to understand. It only involves identifying alternatives and weighing them based on specific criteria.	5 The CFR method is flexible, it allows the inclusion of as many criteria as possible for as many alternatives	5 The CFR method is objective as it is based on matrix assessment of measures	5 The CFR method is sufficient for selecting strategic analysis tools	4 The CFR method is relevant, as it is objective and applicable in selecting strategic analysis tools.	23	2
4.	Gap Analysis	3 The Gap Analysis method is easy to understand as it involves comparing what exists to what should	5 The Gap Analysis method is flexible and is not restricted by any measures	1 The Gap Analysis method is not objective	2 The Gap Analysis method is somewhat insufficient for selecting strategy measurement tools	1 The Gap Analysis method is not relevant in the selection of strategy measurement	12	8

Table 2.2: Assessment of Decision Choice Tools in Selecting Strategy Measurement Tools

							1	
		exist.				tools		
5.	Importance / Performance Matrix	4 The Importance / Performance Matrix is easy to use and understand	1 The Importance / Performance Matrix only allows the assessment of one performance measure and 1 importance measure at a go	5 The Importance / Performance Matrix is objective	3 The Importance / Performance Matrix is sufficient for selecting strategy measurement tools, but might require more than one analysis	4 The Importance / Performance Matrix is relevant for the selection of strategy measurement tools	17	4
6.	Quantitative Decision Making	2 In Quantitative Decision Making, there is not particular guide or method to follow. It is vague	3 The Quantitative Decision Making method seems flexible	5 The Quantitative Decision Making method is objective	1 The Quantitative Decision Making method is not sufficient for selecting strategy measurement tools	3 The Quantitative Decision Making method is somewhat relevant for the selection of strategy measurement tools	14	6
7.	Strategic Assessment Model	3 The SAM method is easy to understand, but somewhat complex. Defining weights requires AHP.	4 The SAM method is flexible, and allows for as many measures as possible	5 The SAM method is objective	4 The SAM method is sufficient for selecting strategy measurement tools	4 The SAM method is relevant for the selection of strategy measurement tools	20	3
8.	Strategic Assumptions Surfacing and Testing	1 The SAST method is not very easy to understand, and seems complex	2 The flexibility of the SAST method is not well understood due to its complexity	3 The SAST method is somewhat objective	1 The SAST method does not seem sufficient for selecting strategy measurement tools	1 The SAST method is not relevant for the selection of strategy measurement tools	8	9
9.	Strategic Choice Approach	5 The Strategic Choice Approach is easy to understand as it follows a clear process	5 The Strategic Choice Approach is flexible, as it allows the use of multiple measures and criteria	4 The Strategic Choice Approach is objective	5 The Strategic Choice Approach is sufficient for the selection of strategy measurement tools	5 The Strategic Choice Approach is relevant for the selection of strategy measurement tools	24	1

2.4.4 Selection of Strategy analysis tools using Strategic Choice Approach

The previous section led to the selection of the strategic choice approach as the most relevant method of choosing strategy tools. Strategic tools relevant to customer-experience and satisfaction as well as enhancing competitive advantage and business outcome are considered. The strategic choice approach was used in selecting the strategy development tools considered in this research.

1. Shaping

Shaping the problem involves identifying the need for tools that can serve as means to an end. This involves understanding the nature of the means required and the nature of the end required. For this review, tools relevant to the development and measurement of user-centred strategies are required. It also requires defining an aim for the process. What was the process hoped to achieve? For this review, the decision process aims at selecting strategic analysis tools of the macro environment, micro environment, internal resources, strategic choice, and strategic implementation, which can be applied in strategy measurement. 90 research tools were listed and described in appendix 6. They were grouped into different categories including:

- Macro Environment
- Micro Environment
- Internal Environment
- Strategic Choice
 - Competitive Strategies
 - Strategy Development
- Strategy Implementation

2. Designing

Once the problem was understood, the criteria for measurement are developed, and weights as well. For user-centred strategies, the following should be considered:

- Number of tools necessary
- Relevance of tools to user-centred strategy measurement
- Relevance to manufacturing and service companies
- Simplicity of tool
- Value of results from the tool

3. Comparing

The criteria are to be measured on a scale of any range. A scale of 1 to 5 was advisable. Numbers beyond 5 might be too much, and below 5 might me insufficient. Each of the weights for criteria should be summed.

4. Choosing

The tools are ranked based on the summation of their total sums, in descending order. Tools with the same sums are assessed based on which has the highest weight on relevance of tool to user-centred strategy measurement, next by value of results from the tool, next by relevance to both manufacturing and service companies, and finally by simplicity of tools.

For the macro environment, the two main tools found were chosen. PEST analysis and Scenario planning are widely popular strategic tools for analysing the macro environment. The macro environment does not have a direct impact on organizations, but generally affects all organisations that exist within it. Therefore, both tools are relevant to the research.

For the micro environment, three out of twenty-six techniques identified were chosen. The journey map analysis deals with users, analysing the different touch points that characterise their interactions with products and services. It was also used by user-experience experts and was therefore relevant to this research. Porter's five forces was a popular strategic tool that considers competition, substitutes, customers, new entrants, and suppliers. This tool covers the roles most of the other micro analysis tools play.

TOWS matrix was chosen as a tool for the internal and external environment. Other tools in this category were the SWOT Analysis, Risk heat map and risk matrix. TOWS analysis and SWOT analysis play similar roles as they both analyse strengths, weaknesses, opportunities, and threats. However, the TOWS analysis was a more technical matrix and logically follows the principle that the external environment be analysed before the internal environment. Factors considered for the risk analysis are usually derived from the PEST analysis and SWOT analysis, so there was no need for it in this review.

The strategic tools considered in the internal analysis are the personas, value chain, cost benefit, and VRIO analysis. These tools were chosen because they relate to the nature of this research as well and summarise all other strategic tools for internal analysis.

A persona was also a usability tool that deals with customers, as it involves the development of archetypal users to direct vision and design strategy. Value chain analysis was a diagnostic tool, used to determine where to create more value for customers. It was also important because it has a research and development element which was necessary for strategy measurement- especially with user-experience design. VRIO (Value, Rarity, Imitability, and organisation) was used in analysing firm's internal resources and capabilities to find out if they can be a source of sustained competitive advantage. It covers both resources and capabilities of the organisation.

Cost-Benefit analysis was chosen because when determining how to involve customers in the design process, the ratio of benefit derived compared to the cost was necessary to be determined.

Strategic choice involves tools for determining competitive strategy, and strategy development. For this research, the Porter's generic strategy, and Bowman's clock are considered for the competitive strategy, while Ansoff Matrix and Strategy Diamond are considered for strategy development. Porter's generic strategy was used to describe how a company pursues competitive advantage across its chosen market scope. Ansoff strategy was used in matching up existing and new products and markets. The strategy diamond covers arenas, vehicles, differentiators, staging and economic logic. Bowman's clock was chosen because it has the hybrid element that considers uniqueness and low cost.

From the numerous tools for strategy implementation, the tools chosen were balanced scorecard, and strategy mapping. Balanced scorecard monitors strategy execution and performance from organisations' finance to customers, to internal processes, to learning and growth. All the tools considered are applicable to both manufacturing and service companies, compared to a few other tools found. They all differ in nature from models, to maps, to templates. All the tools considered have low to medium complexity as assessed in appendix 6.

2.5 Relevance and Shortcomings of Strategic Management Tools in Strategy Measurement

The application of the strategic choice approach led to the selection of the following tools for review:

- PEST (Political, Economic, Sociocultural, Technological) analysis
- Scenario analysis
- Porter's 5 Forces
- Customers Journey Mapping
- Personas
- VRIO
- Cost Benefit analysis
- Value Chain analysis
- TOWS
- Porter's generic analysis
- Bowman's clock
- Strategy diamond
- Ansoff's matrix
- Balanced scorecard
- Strategy mapping

These tools are reviewed in the following sections based on classifications by Robson (1997); external analysis, internal analysis, strategy choice, and strategy implementation.

The external environment is said to be made up of the Societal environment (Robson 1997), which is often referred to as Macro environment by authors (Jeyarathmm 2008, Pearlson and Saunders 2010), and; Task environment (Robson 1997), which is referred to as Micro environment (Pearlson and Saunders 2010, Wu et al. 2012).

2.5.1 Macro Environment Tools

The relevance of organizations' strategies considering the external environmental drivers involves decisions based on strategic analysis of the external environment (Collin 2004). Therefore, strategy measurement highly depends on the measurement of existing strategies against external environmental factors. According to Robson (1997), macro environmental factors can be evaluated using the PEST analysis, and Scenario Planning. Similarly, Johnson and Scholes (1993) and Pearlson and Saunders 2010) also identified both techniques for measuring relevance of a strategy, when considering the Macro environment. Rao and Subba (2010) points out that the PEST analysis comes in various forms as it has developed over time, but stands for Political, Economic, Social, and Technological. All the elements are represented in figure 2.8, which shows the interconnection between all the elements of the macro-economy.

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Figure 2.8: The Macro Environment (Adapted from: Aguilar 1967)

Scenario analysis, which is the other technique used in understanding and evaluating the Macro environment is defined by Buytendijk et al. (2010) as a method used by managers to think creatively about possible discontinuous future states and prepare themselves for multiple plausible futures, not only the one they expect to happen. Robson (1997) explains that scenario analysis is not a standalone technique. In conducting scenario analysis, it is important to understand the PEST framework as well (Robson 1997). Rao and Subba (2010) states that the factors involved in Macro analysis are broad and do not directly affect the company. Both techniques, especially the PEST analysis identify all necessary drivers to be considered in the Macro environment, however, the drivers affect organizations, but do not provide means of tackling the threats posed by the environment to the success of business strategies, or how to take advantage of the opportunities identified. This implies the need for other tools in determining strategic actions to be taken. An established fact however is the importance of Macro analysis in the strategy development process, however it is the aim of this review to discuss the usefulness of PEST analysis and scenario planning in measuring strategies, and the constraints or limitations faced in the use of these tools in the measurement of strategy in organizations.

The PEST analysis developed by Aguilar (1967) describes the landscape in which a firm operates. The nature of the PEST analysis makes it useful only as input for strategy measurement. It aids in the identification of trends in the Macro environment (Collin 2004), which help managers make choices while developing strategy, and provide a framework for reference to determine the appropriateness of strategy considering macro environmental drivers. Haughey (2016) further states that companies can rate the elements in the Macro environment, enabling them to decide which factor has the most impact on the company, or which department is more affected by what element in the Macro environmental drivers. This would have to be developed by managers that need it.

According to Thakur (2010), the speed at which environmental drivers change, determine why and how the macro environmental factors may affect the success of an organisation. Jain (2016) also points out that the use of the method requires consistent analysis to keep up to speed with the consistent changes in the environment. Beyond the effects of the environmental drivers on the tool, Haughey (2016) further suggests that proper PEST analysis requires a lot of information to be collected. However, users tend to get confused and lose sight of what factors are more critical when handling too much information.

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However, Haughey (2016) argues that collecting of information for the analysis is not costly, Jain (2016) suggests that collecting enormous amounts of relevant data from the right sources becomes a bit of a problem, especially since most of the pertinent and latest data must be collected from external agencies, making PEST analysis not only time consuming but costly as well.

Scenario analysis on the other hand, is defined by Porter (1985: 63) as "an internally consistent view of what the future might turn out to be - not a forecast, but one possible future outcome." According to Morrison (2009), Herman Kahn is considered the pioneer scenario analysis in his work on military strategy. Scenario analysis does not define what should be done in each possible future but helps understand the possible implications and benefits of different approaches. Having all the potential outcomes laid out can help make the best decision. The different scenarios can be used as benchmark for determining how strong and relevant each strategy is. To Morrison (2009) however, the main drawback of scenario analysis lies in the interpretation of results: "how do you decide which scenario is preferable?" Morrison (2009) emphasises the difficulty in measuring uncertainty and impact because they can be highly subjective.

According to IIED (2016), the range of multiple futures or scenarios is complicated to achieve and complicate decision-making process. Most importantly, the time-consuming process lacks quantification. These shortcomings are addressed by the research-based framework developed in this research as is explained in section 6.4.

2.5.2 Micro Environment Tools

Unlike the Macro environment, the Task or Micro environment directly affects organisations, making sourcing of information easier compared to the Macro environment (Jeyarathmm 2008). Many techniques exist for developing strategy; however, there is a limited – or rather almost non-existing range of identified tools for measuring strategy relating to the Micro environment. This problem is beyond just the Micro environment, with the exception of the balanced scorecard used as a tool for strategy implementation and measurement (Tayler 2010), which takes into cognisance "customers", an important factor on the Micro environment. This conclusion was made from a long search for tools specifically aimed at measuring company strategy. Most, if not all strategic tools primarily aim at developing strategies. However, some tools can retrospectively serve the purpose of measuring strategy after they have been implemented as previously discussed in section 2.3.

For external analysis of the task environment, the Porter's five forces will be reviewed alongside the Customer Journey Map. Porter's five forces is a strategy development tool (Pelt 2010), which considers micro environmental drivers for analysis. According to Robson (1997) and Pearlson and Saunders (2010), Porter's five forces is used in the identification of the key environmental drivers in the task environment.

Wu et al. (2012) however look at it beyond strategy development, but also as an analytical tool, therefore aiding in strategy measurement.

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Figure 2.9: Porter's Five Forces (Porter 1980)

According to Wu et al. (2012), a change in any of the forces requires a business unit to re-assess the marketplace owing to the change in industry information. By applying their core competencies, business model or network, firms are able to achieve a profit above the industry average. Figure 2.9 identifies the forces measured by the strategic tool. The tool considers competitive rivalry in the industry first, followed by threat of new entry, bargaining power of suppliers, threat of substitutes, and bargaining power of buyers.

These forces when identified can be ranked to determine the level at which they affect organisations.

According to Grundy (2006:213), "opportunities for using Porter's model in an even more practical way, include: mapping the competitive forces, which can vary significantly over market and competitive terrain and within the same industry; understanding its dynamics; prioritizing the forces; doing macro analysis of the sub-drivers of each of the five forces; and exploring key interdependencies, both between and within each force." Grundy (2006) further argues against the Porter's five forces stating the model has a relatively difficult structure to assimilate.

Citing Quinn (1980) and Mintzberg (1994), Grundy (2006:214) states that "Managers tend to like analytical concepts spelt out in very simple terms, otherwise they find it difficult to adapt to their default, fluid strategic management style, sometimes characterized as 'logical incrementalism' or as 'emergent strategy'". Mathooko and Ogutu (2015) add that Porter's five forces framework fails to link the analysis of the competitive forces to management actions. In a research on public universities in Mathooko and Ogutu (2015) conclude that to improve quality, efficiency, and effectiveness, organisations need to adopt a business-like approach in their strategy measurement, which Porter's five forces does not provide. The data-driven framework developed in this research addresses these shortcomings, and is explained in section 6.4.

The second tool considered in the review if the micro environment is the customer journey map shown in figure 2.10. Mccoll-kennedy et al. (2015) describe the customer journey as a sequence of events which could be designed or not, what customers go through to learn about, purchase and interact with company offerings including commodities, goods, services or experiences. Norton and Pine (2013) explain that understanding and shaping the sequence of events that the customers encounter makes companies to be customer-centric, making the customer journey map more than a marketing tool.

Norton and Pine (2013:12) describe the customer journey as "the result of the implementation of a coherent strategic plan following a scripted sequence of events companies produce to deliver value to the customer, profitability to the company and differentiation from the competition." According to Caru and Cova (2015), journey mapping enables company's measure customer-centred vision of the future and align the promise making and promise keeping efforts of an organization profitably. Managing the customer journey, done right, is about much more than incremental improvement to current offerings; it can help companies innovate, allocate resources and transition from an old business model to a new one based on a new job customer want done (Norton and Pine 2013).

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Figure 2.10: A Customer Journey Map.

Mccoll-kennedy et al. (2015) states that journey mapping requires employees to recognise the importance of working with customers, which some do not. Also, they are required to read customers, reach out, offer related or complementary resources, reintroduce resources, and reward and recognize performers. All of which might be difficult for employees to do. The journey map does not map out the service ecosystem of customers to determine the characteristics of the interactions that result in exceptional service experiences, or how service experiences change over time. According to Caru and Cova (2015), the tool has not been focused on mundane service experiences. These shortcomings are addressed by the user-centred framework developed in this research as is described in section 6.4.

2.5.3 TOWS Matrix

Robson (1997) defines SWOT analysis as a framework that defines the relationship between internal and external appraisals in strategic analysis. It is a model for assessing the strengths, weaknesses, opportunities, and threats that face an organization. Strengths and weaknesses are classified by the internal circumstances of the organizations, while opportunities and threats are defined by the external environment. Weihrich (1982) however argues for the external environment to be analysed first, identifying the opportunities and threats, before the internal environment is assessed. The figure 2.11 below shows the TOWS Matrix. Some materials have been removed from this thesis due to Third Party Copyright. Pages where material has been removed are clearly marked in the electronic version. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.

Figure 2.11: TOWS Strategic Analysis Matrix (Robson 1997)

Chapman and Cowdell (1998) also, suggest that the acronym TOWS is more appropriate for firms because the environmental constraints have influence. Although they argue that putting the threats first might be perceived as pessimistic, suggesting a reactive rather than a proactive approach, it is more relevant in strategy measurement than most tools. Thus, to evaluate the internal weaknesses and strengths, the external environment should first be considered and therefore favour the use of TOWS rather than SWOT analysis. According to Weihrich (1999), this TOWS Matrix supplements Porter's analysis, and is a less deterministic than Porter's model.

2.5.4 Internal Environment Tools

Measuring strategy based on the internal environment requires measurement of organisations' resources and competencies (Robson 1997). An organisation's capabilities should be the internal metrics used in determining how well a strategy works for them. These include the company's expectations, objectives, power, and culture, which are the organizational purposes, and resources and capabilities of the company, which are the organizations competences. Rao and Subba (2010) describe companies as systems that convert input within themselves, thus creating an environment within themselves. Unlike the micro and macro environment where the best strategy can be learnt on a trial and error basis, for a class of local environment (Ashby 1960), the internal environment requires utmost care in ensuring relevant strategy. However, strategies could also result from unintentional actions.

The internal environment is very important in strategy measurement because strategies depend on the objectives of the company (Shakshir 2012), whether in relation to the micro or macro environment. For this reason, a framework or model is required in measuring strategy (Shakshir 2012).

Value Chain

The Value Chain analysis aids in analysing companies' competencies, which leads to understanding strategic capability (Robson 1997). In conducting a company's internal analysis, Mol (2015) states that the value chain is expected to be more transparent but, in most cases, managers do not make them transparent enough. Taylor (2012) state that the value chain is a diagnostic tool for analysing firms' resources. According to Roztocki and Weistroffer (2011) the value chain can be used in analysing the benefits of service investment, therefore it is more relevant to financial based strategies than customer-centric strategies. The value chain is used to analyse financial value at each stage of production (Rieple and Singh 2010), so managers can determine where to avoid cost and where more value is gained (Hergert and Morris 1989).

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Figure 2.12: Generic Value Chain (Adapted from Roztocki and Weistroffer 2011; Rieple and Singh 2010)

However, it is also important for product-based strategies as it deconstructs the stages that a product follows from the very beginning of its production to its final sale, and even beyond (Rieple and Singh 2010). Primary activities are often easier to cost, in that it is relatively straightforward to calculate the staff time, raw materials, or machinery costs involved in a specific design or production task (Partridge and Perren 1994).

But within organisations it is sometimes harder to evaluate value added, as no price is calculated before the product is passed on to the next stage, and for many activities little data is gathered. Nevertheless, at the end of this chain of activities a product is sold, ideally at a profit. The value chain analysis allows a firm's managers to evaluate where most of that profit or value was achieved, and where more could be found.

VRIO

VRIO concentrates on an organization's performance in relation to their resources (Anderseen 2011). Possessing a strategic resource, relationship or competence, and making it have a positive impact on firms' performance is complex (Sheehan and Foss 2007). For this to occur, the resource must be rare, valuable, imperfectly mobile, and non-substitutable (Barney 1991). VRIO does not cover all dimensions of the relationship between strategic resources and superior performance (Anderseen 2011), and VRIO is tautological, in that some terms have similar meanings or requirements. Also, the VRIO framework does not rank the qualities according to their importance for which resources or what industry (O'riodan 2006), highlighting is a problem faced with the use of most tools. There are no standards for measurement or ranking. The data-driven framework developed in this research addresses these shortcomings, and is explained in section 6.4.

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Figure 2.13: VRIO Model (Adapted from: Su-ying et al. 2012)

VRIO has been advocated as a framework for understanding which resources are valuable to a firm and what makes them so, how vulnerable they are to imitation and how the firm can exploit and manage them sustainably (Barney and Hesterly 2006). Ardeal and Antonio (2012) argue that the "O" in VRIO refers to Dynamic Capability, which are most important in gaining competitive advantage. Ardeal and Antonio (2012) argue that 'O' is not well defined in the VRIO. Capabilities of firms are VRI, but none of the resources are even VRIO.

The VRIO however does not explain how competitive advantage is achieved (Priem and Butler 2001).

According to Knott (2015), there's no research to show how they help analyse firm's resources, or metrics of VRIO. This shortcoming is also addressed by the framework developed in this research as is described in section 6.4.

Personas

According to Sanders (2007), personas can be used as a key element in design and redesign of products. Personas serve as a unifying factor between customer, client and agency, while simulating information like customers-ages, levels of education, where they live and how much they earn can be reeled off, unlike information like customers' attitudes and behaviours, let alone their emotional needs while shopping for certain products. This is more crucial than statistics of demographics (Sanders 2007). Personas bring insight, and can be used in achieving brand experience, ensure innovation and creativity. It considers the purpose of the product, in relation to how it serves customers' needs (Himmelspach 2010).

A shortcoming lies in the possibility that managers might make a limited number of personas, thereby limiting the number of people they are marketing to. It requires in-depth consideration. It improves product experience, customer satisfaction, engagement, and lifetime value of product. It however requires frequency, because customers get bored of older products with time. This implies that customer-oriented objectives should most likely change, and if necessary, the objectives as well. It also requires a lot of investment as organizations realize they are no longer selling products and services but delivering on experiences and outcomes, the shift to delivering on a brand promise requires the ability to deliver mass personalization at scale (Murdock 2011).

Cost-Benefit Analysis

According to Williams (2008:67), "Cost-benefit analysis (CBA) sets out all the costs and benefit associated with a given project in monetary terms, in order to weigh up whether a project brings a net gain to organisations, and compare to other projects, thereby measuring how to distribute resources". A well-planned cost-based analysis gives manages information about the project, creating a common measurement for all costs and benefits (Nyborg2014).

Cost benefit analysis could measure cost effectiveness, or cost utility of a strategy. According to Robinson (1993), Cost-benefit analysis is probably the most comprehensive method of economic evaluation available. A human capital approach means that the value of people's contributions is linked to what they are paid. The main difference between cost-benefit analysis and strategic tools is that it seeks to place monetary values on both the inputs (costs) and outcomes (benefits).

Nyborg (2014) states that CBA is not value-free. When used to measure welfare, it is based on highly controversial value judgements. When used to measure efficiency, it is based on assumptions of limited relevance to democratic decision-making processes. CBA measures total net willingness to pay, neither more nor less. Some scholars explicitly consider CBA as a tool for measuring a product's contribution to social welfare; others, while not necessarily accepting the welfare interpretation, speak of it as a means to indicate product's efficiency. The data-driven framework developed in this research addresses these shortcomings, and is explained in section 6.4.

2.5.5 Strategy Choice

According to Robson (1997) once management has generated a picture of strategic possibilities, it requires techniques that assist in selecting from available choices. This involves the identification of options, evaluation of these options, and selection of an option. Therefore, strategy measurement occurs in this level as well. This is done on business unit level and corporate unit level. On the business level, the company's competitive strategy is chosen, using frameworks like Porter's generic strategy or Bowman's clock. On the corporate level, the strategy is developed using frameworks such as Ansoff. Strategic choice basically follows a two-step process of analysing competitive strategy at the business unit level, then strategy development at the corporate unit (Jussani et al. 2010). Competitiveness is important especially in the globalized economy (Lisboa et al. 2011). As a result, companies need to make informed decisions, regardless of the industry they operate in, which requires research and appropriate tools. With these tools, companies can rethink the products and services they offer, and make them cheaper and at the right time. For the purpose of this research, the values and shortcomings of porters generic and bowman's clock will be examined for competitive strategy, while Ansoff and strategy diamond will be considered for strategy development.

Porter's Generic and Bowman's Clock

In the Porter's Generic Strategy, to gain competitive advantage, a firm has to achieve either 'cost advantage', 'focused', or 'differentiation' strategies (Porter 1980, 1985). Succeeding in any one of the three gives firm's superior performance over their rivals (Jian-Huia 2012). The three strengths are incompatible with each other due to limited resources in organisations. Going after all three strategies results in being 'stuck in the middle', leading to poor performance (Lin and Wu 2007), (Liu and Xu 2008). The Porter's Generic strategy is applicable to both manufacturing and service companies (Allen and Helms 2007, Bordean et al. 2010, Nandakumar and Ghobadian 2011).

In order to measure the relevance of a company's strategy, so as not to end up in 'stuck in the middle', Porter's generic strategy (Porter 1980) is recommended as a basis for measuring the appropriateness of competitive strategy.

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Figure 2.14: Porter's Generic Strategies (Adapted from: Porter 1980)

Avoiding being 'stuck in the middle' is achievable by measuring the single adopted strategy. However, some researchers believe both low cost and differentiation strategies are compatible (Allen and Helms 2006, Hitt, Ireland and Hoskisson 2003, Zeng and Huo 2006). Shaw (2012) identifies another short coming of the matrix, stating that it does not recognize several alternative strategies that exist between narrow target and low-cost strategies. In between a mass market and a niche strategy, there are a variety of segment expansion strategies (e.g. multi-segment or acrossthe-board, as previously discussed). Shaw (2012) also concludes that all variations of Porter's generic strategies, except cost leadership, may also be derived from Smith's (1956) core marketing strategies: differentiation and segmentation, making both frameworks the same. Therefore, Porter's framework overlaps with other typologies. For example, Porter's strategy of differentiation is similar to Miles and Snow's (1978) prospector strategy, and Porter's strategy of cost leadership is similar to Miles and Snow's defender and Hambrick's (1983) and Dess and Davis's (1984) cost leadership strategies. Porter's strategy of focus is very much like Miller and Friesen's (1986) niche innovator strategy. According to Robson (1997), the best method of analysing competitive strategy a company should adopt is Porter's generic classification. This is based on three possible optionslow cost, differentiation, or focus/niche.

Kim et al. (2004) examined strategy types among e-business based on Porter's 1980 generic strategy.

Because of the limiting nature, and lack of variety in strategic choices of porter's generic strategy,

some authors (Johnson and Scholes 2005, Shakshir 2012) see bowman's clock as a better alternative

to Porter's generic strategy. Bowman's clock is shown in figure 2.15.

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Figure 2.15: The Strategy Clock (Johnson, Scholes and Whittington 2005)

An organization could operate on 'no frills', which is low price and low perceived benefits, or low price, hybrid, differentiation, focused differentiation, or high price and low benefits. Shakshir (2012:985) explains that the Bowman's clock is "based on the principle of achieving competitive advantage by providing customers with what they want, or need, better or more effectively than competitors." Positions on the "strategy clock" represent different positions in the market where customers have different requirements in terms of (perceived) value and (monetary) cost considerations. According to Shakshir (2012), Positions 6, 7 and 8 are not valid options on competitive markets. The consumer will never choose a product on a free market that gives added value below the paid price.

Ansoff's Matrix

According to Shaw (2012), Ansoff's growth strategies were developed for corporate management, but are applicable in marketing management as well.

Jussani et al. (2010) states that the Ansoff strategy lacks specificity. Shaw (2012) emphasizes the glaring inconsistency that has escaped notice in the marketing literature. This inconsistence however has not been identified much in other literature. Ansoff matrix, developed by Ansoff 1988 is used in determining strategic development directions. The matrix is applicable in different sectors, for instance, Watts et al. (1998) used the Ansoff matrix in strategy development for a programme of research among food sector Small and Medium Enterprises in the North West of England.

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Figure 2.16: The Ansoff Matrix (Johnson and Scholes (2005) Adapted from Ansoff (1988))

The first part of the Ansoff matrix derives from the focus on growth and, more specifically, strategies for growth relative to the four quadrants of Ansoff's matrix (Ansoff 1965): market penetration, market development, product development and diversification. Jussani et al. (2010) explains the matrix.

Strategy Diamond

According to Hambrick and Fredrickson (2001), the strategy diamond is one of those strategy frameworks that help analyse situations, but do not give guidance on what the product of the analysis should be or what should constitute a strategy. Despite this, managers do not need a guidebook on how to make options for strategy. Strategies could be for different aspects of business such as service strategy or branding strategy or acquisition strategy.

These different strategies make up an integrated unified corporate strategy. In this sense, the strategy diamond is a framework with five elements that aid strategy design. The elements considered include:

- 1. Arenas: where will we be active?
- 2. Vehicles: how will we get there?
- 3. Differentiators: how will we win in the marketplace?
- 4. Staging: what will be our speed and sequence of moves?

Economic logic: how will we obtain our returns?
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Figure 2.17: The Strategy Diamond (Hambrick and Fredrickson 2001)

The strategy diamond as shown in figure 2.17 is grouped in four elements. Companies can analyse where their strategy will be more active the ways they have been going about achieving it, the methods they have adopted in applying the strategy, the speed at which they have been going, and the returns expected. This method however as emphasized by Hastings (1996), measures the quantity of earnings, and not quality of experience given to customers. The strategy diamond does not tell managers if the strategy is good, it only tells them if the process is complete (Hambrick and Fredrickson 2001). These shortcomings are addressed by the framework developed in this research as is explained in section 6.4.

2.5.6 Strategy Implementation Techniques

Strategy implementation is aided by strategy frameworks such as: Balanced Business Scorecards (Kaplan and Norton 1992) which considers financial measures of an organisation, and key non-financial measures relating to customers or clients, internal processes, and organisational learning and growth need; Strategy Mapping (Kaplan and Norton 1996). Ramooshjan et al. (2014) state that formulation and evaluation of strategy plays important role in the strategy management.

Considering company objectives are financial and non-financial, researchers (Hastings 1996) propose models which allow strategy to be evaluated on quantitative, qualitative and intangible criteria, such as the strategy evaluation model by Hasting (1996).

Once a strategy has been created the success or demise of it is dependent on the quality of the strategy (Liberatore, 1992, Mintzberg 1993). Implementation occurs both when strategy has been developed, and after evaluation as ilustrated in figure 2.18.

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Figure 2.18: Strategic Management Process (Rao and Subba 2010)

Cravens et al. (2010), propose the use of the balanced scorecard as a means to develop a formal assessment approach that evaluates strategy. For this research, the balanced scorecard and strategy maps will be evaluated as strategy implementation and measuring tools.

Banker (2015) describes the balanced scorecard (Kaplan and Norton 1996) as a strategy formulation, deployment and evaluation tool. The balanced scorecard is a popular tool used by many companies and researchers. Banker (2015) states that for all companies in the manufacturing and service sector, the steps to building a scorecard are the same. What differs is determining the right measures for evaluation, aligning the right initiatives, and assigning the right ownership.

According to Tayler (2010), the metrics for evaluation and interpretation depends on managers' preferences. Therefore, actual conclusions are consistent with desired conclusions (Kunda 1990). According to Lipe and Salterio (2000), scorecard implementation is influenced by the evaluator's involvement in the implementation process. The data-driven framework developed in this research addresses these shortcomings, and is explained in section 6.4.

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Figure 2.19: The Balanced Scorecard (Kaplan and Norton 1992)

It is important to have more than one measure to gain a balanced perspective of strategy. As shown in figure 2.19, four perspectives of the scorecard- Financial strategies, customer strategies, internal processes, learning and growth strategies (Kaplan and Norton 1992). The balanced scorecard is used to measure the success of strategy (Banker et al. 2004, Dilla and Steinbart 2005, Kaplan and Norton 2001, Libby et al. 2004), focusing on how it brings balance through those four perspectives. The scorecard aids in defining strategic objectives and communicating them throughout the organization, identifying initiatives to achieve those objectives, and evaluating whether those objectives have been achieved (Buytendijk et al. 2004). The strategy map or value driver map ties scorecards to strategy development (Malina and Selto 2001, Campbell et al. 2008). The measures are selected, data to be used is collected, the scorecard reports are given formats, and the scorecard information is disseminated. On a positive note, it includes financial and non-financial metrics that are important for long term performance (Banker et al. 2004).

According to Irwin (2002), strategy mapping aids in interpreting the role of strategy, and measuring how strategy is achieved.

The strategy map is a framework by Kaplan and Norton (1996) used in putting certain organisational aspects in place, such as finance, marketing, continuous improvement and an internal view of excellence, and staff development. From the strategy map in figure 2.20, strategy maps are also best used when based on the balanced scorecard structure.

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Figure 2.20: A Strategy Map (Adapted from Kaplan and Norton 1996)

Analysing profit based on profit and cost, customers satisfaction, retention, and acquisition, internal processes, and learning and growth. Kaplan and Miyake (2010) suggest that linking objectives in the strategy map tells the story of the strategy. A strategy map alone is not an effective tool to help managers make better decisions (Kaplan and Miyake 2010). More details, such as a correlation between strategic measures in the strategy map or guidelines for the use of the map, could help make a strategy map more useful (Rompho 2012). Lipe and Salterio (2000) found that decision makers tend to compare the measures that are common across different units and ignore the measures that are unique to individual business units. These shortcomings are addressed by the framework developed in this research, which is adaptable to the uniqueness of different business units as is explained in section 6.4.

2.6 Identification and Classification of Business Environmental Drivers

Environmental drivers are factors in business environment that have direct or indirect impact on innovation and orientation in organisations (Mazur and Strzyzewska 2010), thereby directly or indirectly affecting business performance. The classification of environmental factors by various researchers (Calatone et al. 2002, Lynch 2012, and Mazur and Strzyzewska 2010), consists of "Internal" and "External" business drivers. Considering these classifications, the performance drivers are categorised by their relationships to industry in this research by Manufacturing and Service industries, to determine the relationship and trend in drivers of both industries.

This is important because this research aims at finding and developing a suitable user-centred strategy measurement tool for both manufacturing and service industries. Identification of factors similar to both industries, and those affecting only one industry will be helpful consideration.



Figure 2.21: Classification of Environmental Drivers of Business Performance.

Based on the identified research, figure 2.21 illustrates the classification of environmental drivers into internal drivers and external drivers. These drivers- which will further be broken down- impact business performance of both Manufacturing and Service companies, which is characterized by organisations' orientation of these drivers, and innovativeness. The figure above shows that performance of Manufacturing and Service companies depends on Innovation, and Knowledge Management, which are affected by Internal and External Environmental Drivers. It also suggests that the internal business environment is affected by external environmental drivers. Considering the broad scope of strategy management, it is possible there are other ways to categorize factors that characterize business performance beyond innovation and knowledge. However, this categorization is sufficient for the need and nature of this research.

2.6.1 External Environmental Drivers of Business Performance

The external business environment is beyond the control of management (Ward et al. 1995). Taking a different angle from Lisboa et al. (2011), and Mazur and Strzyzewska (2010), Efrat and Shoham (2012) assert that external factors influence short term performance, but in the long run the, major influence is the internal capabilities. From a positive perspective, Efrat and Shoham (2012) argue that external drivers such as high market potential drives internationalization, technological orientation creates and environment for rapid technological change. However other external drivers such as target country politics, economy and culture are more likely to have negative impact on strategic performance. Ward et al. (1995) identify certain factors in the external business environment to include labour availability, competitive hostility, and market dynamism. As discussed in the internal business environment, some factors relate to both Manufacturing and Service companies.

For instance, competition is identified as an external driver in manufacturing companies by Efrat and Shoham (2011), Mazur and Strzyzewska 2010, Lisboa et al. (2011), and Wagner (2015). Lee (2008) also identifies it as a factor in Service companies as well, while Dibrel et al. (2015) and Ward et al. (1995) classify it as a driver in both Manufacturing and Service companies. Market orientation however is a much broader driver, which involves knowledge on dynamism, growth and market cycles (Lisboa et al. 2011). Market orientation is also identified as a driver in manufacturing companies by (Chatzoglou 2014, Efrat and Shoham 2011, Mazur and Strzyzewska 2010, Lisboa et al. 2011, Wagner 2015), while (Dibrel et al. 2015, Yang 2014) and identify it as a driver in Service companies. Ward et al. (1995) found that the environmental drivers have a huge effect on operational strategy and business performance. If managed well, the drivers will work in favour of the business, yielding good performance, and improved cost reduction strategies. Ward et al. (1995) based their research on the opinions of managers which they obtained using surveys in a range of industries in Singapore. As a result of the combination of industries, their results are applicable to both Manufacturing and Service companies.

External Environmental Drivers of Business Performance in Manufacturing Companies

Chatzoglou (2014) identified certain drivers of business performance in the preparation of their questionnaires distributed in manufacturing companies. Chatzoglou (2014) define external drivers to include logistics arrangements, environmental regulations, and weather conditions. These factors are clearly beyond the control of management, like Ward et al. (1995) described. Wagner (2015) also supports the classification of environmental regulations as external drivers of business performance, broadening the scope of regulations beyond just environmental, but also all other country and international regulations affecting business operations. Efrat and Shoham (2012), and Ward et al. (1995) add that the external drivers of business environment are the "target market", which includes technological turbulence, and target-country risk (political, economic, and social).

Country risk is also classified by Wagner (2015) as a driver in Manufacturing companies, however, Demiurgic et al. (2006) and Cull et al. (2015) classify it as a driver in Service companies as well. On the other hand, findings by Ward et al. (1995) relate to that of Lisboa et al. (2011), who add that customers, supplier involvement, and retailer participation are the factors to consider when measuring firms' innovativeness, therefore serve as drivers of business performance. Customers are also argued to be external drivers of performance in manufacturing companies by Chatzoglou (2014), Dibrel et al. (2015), Efrat and Shoham (2011), Mazur and Strzyzewska 2010, and Wagner (2015). However, it is also argued to be an external driver in Service companies by Demirguc et al. (2006), Lee (2008), Moon (2006), Yang (2014), and Zhou and Li (2010). Retailer participation on the other hand is seen as a driver in manufacturing companies only by Wagner (2015).

This might be because other researchers have not thought to research on the impact of retailer participation on business performance as an environmental driver. Wagner (2015) collected data from 703 Dutch and German Manufacturing companies using survey, in a research on linking environmental drivers to business performance. Drivers identified by Wagner (2015) include stakeholder's demands, and social activities of the firm, integration of drivers to management activities has a direct link to improved performance in organization. Other factors include loan risks, suppliers, distributors, and the public. Demirguc et al. (2006) also classifies creditor risk as an external driver in manufacturing companies.

External Environmental Drivers of Service companies

Customers are the most important drivers of business performance in Service companies (Moon 2006). Demirguc-Kunt et al. (2006) also include the legal systems, financial sectors, shareholders and creditors, regulations and regulatory burdens, and most importantly the customers, in a research on the impact of business performance on organizational choices and business performance. Similar to manufacturing companies, knowledge of competitor's strengths and weaknesses, and customer need should be identified for exploitation or exploration of innovation (Zhou and Li 2010). Cull et al. (2015) also identify regulations and economic reforms to be micro economic drivers of business performance.

On the other hand, Yang (2014), based on a survey carried out in Chinese Service companies and analysed using regression analysis, stated that external drivers of business performance in Service companies include competitive intensity, market and institutional dynamism as drivers in Service companies. According to Epstein and Roy (2001), it is important to understand the business environment in order to develop strategies and put them in action. The identification and management of the drivers enable organizations to successfully achieve corporate strategy for social responsibility. Figure 2.22 illustrates factors that make up external drivers of business performance. Similar to Figure2.24, the factors are also represented by colour codes to distinguish those that relate only to Manufacturing companies, Service companies, or both Manufacturing and Service companies. Numbers are also used to identify authors that see them as external drivers of business drivers.

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Manufacturing (M)

Manufacturing and Service (M

and S)

- (MandS) Mazur and Strzyzewska (2010)
- 2. (M) Chatzoglou (2014)
- (M) Efrat and Shoham (2012)
- (MandS) Dirbell et al.
 (2015)
- 5. (M) Lisboa et al. (2011)
- 6. (S) Yang (2014)
- 7. (S) Lee (2008)
- 8. (M) Wagner (2015)
- 9. (S) Moon (2006)
- 10. (S) Demirguc et al. (2006)
- 11. (S) Zhou and Li (2010)
- 12. (MandS) Ward et al. (1995)
- 13. (S) Cull et al. (2015)

Figure 2.22: External Drivers of Business Performance.

Similar to Figure 2.24, Figure 2.22 also shows that some external drivers are unique to the manufacturing industry and those drivers that affect the Service industry also affect the manufacturing industry. Certain factors such as labour availability, creditor risk, weather condition, logistics, social activities, technology turbulence, and suppliers actually affect businesses. However, their levels of importance depend on the nature of the business. Customer orientation, competitor orientation, and market orientation happen to be the most important external drivers of business performance. The drivers of business performance are definitely not limited to these. Detailed research on companies will help determine more drivers of business performance in both manufacturing and service companies.

2.6.2 Impact of Macro Environmental Drivers on Strategy Development Processes

Certainly, the Macro environment is hard to predict, because of the level of uncertainty it comes with (Collin 2004). Rao and Subba (2010) explain that the Macro environment is more than just the forces operating outside the organisation, but the opportunities and threats created by these forces for the existence and development of organisations. These forces, along with the opportunities and threats they pose, cause dramatic changes to the environment, affect businesses, and strategy development (Collin 2004). Luckily, the increase in access to information has created better understanding of what happens within the environment (Rao and Subba 2010). However, Collin (2004) argues that perfect information does not exist, and never will. Despite the level of information that exists, the complexity, uncertainty, and rapid changes in the Macro environment still give managers a level of difficulty to read, affecting the choices they make when developing strategy (Collin 2004).

With similar opinion, Rao and Subba (2010) explain that to formulate strategy, there is a need to examine the relationship between a company's present strategy and the environment, forecast future environment, and probably revise mission and objectives. Collins (2004) points out that this process is complex because of the multiple interactions between different segments of the Macro environment, as shown in figure 2.22 above. Researchers (Collin 2004, Jeyarathm 2008, and Rao and Subba 2010) have identified these segments to include Natural, International, Political, Economic, Environmental, Socio-cultural, and Technological elements. According to Jeyarathm (2008), critical analysis of these segments allows managers to learn about events and trends, which enable them, identify favourable and unfavourable factors in the environment, which help effectively develop appropriate strategy. Similarly, Rao and Subba (2010) state that the analysis of the Macro environment, enabling them review how they wish to interact with the future events, identify fundamental requirements for success in future, and formulate strategy to accomplish goals within the constraints of the fundamental requirements for success.

Jeyarathmm (2008) emphasizes the need to look at these segments on both international and national level. According to Collin (2004), the impact of these environmental factors on the global level is higher than the national level. It is more complex, more uncertain, and much more difficult for multinational companies. This is true because multinational companies are not only dealing with the political, social, economic, and technological segments of their home company, but also all these factors in other countries their subsidiaries are located. Therefore, strategy development is much more complex on the global level. Then again, Ohmae (1995) suggests that knocking down boards, and creating a global market provides companies with as much opportunities as the much talked about threats.

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According to Ohmae (1995), Companies are allowed to be innovative while meeting the needs for different societies and culture. Some countries will allow for cost leadership, while some will allow organisations to be unique and differentiators, implying that the strategy used will hardly be based on choice, rather, the casual background (De Rond and Tiehart 2007). Because of the difference in politics, government policies, technology, culture, economy, industry, etc., then what an organisation is acquitted with, operations might be strained, making strategy development rather difficult. However, on a positive note the organisations gain a wide range of raw material, consumer markets, and labour (Jeyarathmm 2008). While some authors suggest that globalisation renders many companies sick and mortal, the fact remains that it also gives them life and growth (Ohmae 1995). Despite this, it is necessary to understand how each component affects organisations globally and on a national level.

Politics

The political sector of the Macro environment pretty much dictates what an organisation can and cannot do through policies, thereby indirectly controlling business activities (Rao and Subba 2010). According to Robson (1997), this occurs through regulations and laws such as political antitrust regulations, environmental protection laws, tax laws, foreign trade regulations, foreign company regulations, and laws on hiring and promotion, government controls businesses. According to Jeyarathmm (2008), the political segment goes beyond regulations and laws. Another important factor to be considered when conducting analysis on the politics in the Macro environment is the stability of the government (Jeyarathmm 2008). This plays a huge role in determining the strategy an organisation can take. Rao and Subba (2010) explain that this is because a stable government not only aids economic development, but also business growth in particular.

Collin (2004) is also of the opinion that the political environment has an enormous impact on organisations, whether public or private. Based on this fact, Rao and Subba (2010) suggest that a multinational company should consider factors such as the nature of government when deciding which countries to do business in. Rao and Subba (2010) explain that this is necessary because understanding and noting certain concepts such as authoritarian political systems restricting organisational freedom, while democratic political systems promote and encourage businesses will help businesses a great deal. According to Jeyarathmm (2008), the political element is so important, that it affects other segments in the macro environment, especially the economic element. As a by-product of the political environment, the economic environment depends on political stability for growth (Jeyarathmm 2008). Therefore, making certain business and corporate decisions such as which markets to enter, or which products to develop or alter depend on the understanding and complexity of the legislations in the country where the organisations operate.

Economy

The economic segment according to Jeyarathmm (2008) is partially dependent on the political environment, also plays a major role in strategy development (Pearlson and Saunders 2010). According to Rao and Subba (2010), certain factors such as economic philosophies viz., capitalism, socialism and communism affect the way businesses are run. Robson (1997) expands on these factors, adding economic Gross National Product trends, interest rates, money supply, inflation rates, unemployment levels, wages/price controls, devaluation/revaluation, and energy availability and cost. In addition to these, Jeyarathmm (2008) identified economics policies like industrial policy, fiscal policy and monetary policy; economic planning such as five year plans, and annual budgets; Infrastructure factors like banks, transportation methods and financial institution and communication facilities, and; Economic indices like money supply, disposable personal income, savings rate, GNP, interest rate, exchange rate, tax rate, inflation rate, growth rate of the economy, income distribution, balance of payment position, and wholesale price index.

According to Rao and Subba (2010), the economic factors are mutually interdependent, thereby increasing the complexity and difficulty in developing strategy. Collins (2004) on the other hand, suggests that the interaction of the economic factors with other elements in the Macro environment make strategy development even more difficult. Jeyarathmm (2008) emphasize how heavily businesses and even the micro environment depends on the economic environment. For instance, the ability of customers to purchase goods being provided depends on the economic environment (Jeyarathmm 2008). Because of the bearing the economic environment has on the functioning of a business, companies have to take into consideration the kind of products and services they offer, and how these economic factors affected their success.

Society and Culture

According to Jeyarathmm (2008), the socio-cultural element of the Macro environment determines what customers buy and consume. According to Rao and Subba (2010), the influence exercised by social factors is also beyond the company's control. Robson (1997) states that, these factors include lifestyle changes, consumer activism, rate of family formation, growth rate of population, age distribution of population, regional shifts in population, life expectancies, and birth rates. On the other hand, Jeyarathmm (2008) defines culture in terms of, traditions, beliefs, values and lifestyles of people in a society, which result from complex factors such as religion, language, education and upbringing. Rao and Subba (2010) combine both societal factors and cultural factors, showing how they, both relate through: attitude of people to work, attitude to wealth, family, marriage, religion, education, and ethics as well.

The societal element is complex because core cultural values are usually deep rooted and cannot be changed easily (Jeyarathmm 2008). However, Jeyarathmm (2008) also points out that there are secondary cultural values such as faiths and practices which could be changed. Basically, culture defines the types of products and services a company manufactures or renders, while the society describes characteristics of the society in which organisation exists. Therefore, it is necessary for organisations to understand and appreciate cultural differences across countries, especially when going into global business. In developing strategy, it is necessary for managers to consider the trends towards family; lifestyle, and; age groups. This is because they define the kind of customers they deal with, and customer interests.

Technological

According to Jeyarathmm (2008), technology proves to be a strategic weapon in highly competitive environment. Technology has far reaching impact on business in terms of improved products, improved processing, usage of new raw materials and new product development. Rao and Subba (2010) are also of the opinion that the technological environment exerts significant influence on business. Robson (1997) identifies some factors that make up the technological environment such as spending on research and development, focus of technological efforts, patent protection, new products, new developments in technology transfer from lab to marketplace, and productivity improvement through automation. According to Rao and Subba (2010), this environment affects all types of business, whether manufacturing or service, just like every other Macro element. "The influence of technology on a company's products, services, markets, suppliers, distributors, competitors, customers, manufacturing processes, marketing practices and competitive position is phenomenal" (Rao and Subba 2010:92).

Pearlson and Saunders (2010) identify the need to identify and evaluate key technological opportunities and threats in developing strategy. According to Rao and Subba (2011), this is because the technological environment influences businesses in ways such as reducing or eliminating cost barriers, creating shorter production runs, creating shortages in technical skills, creating change in values and expectations of employees, dealers and customers, creating new competitive advantage. Based on these, Jeyarathmm (2008) also suggests the need to examine the relative merits and cost effectiveness of alternate technologies, technological changes taking place in the industry and the by-products emanating from new technologies. According to Collin (2004), managers should be able to forecast technological trend and select appropriate technology for products.

2.6.3 Impact of Micro Environmental Drivers on Strategy Development Processes

Based on a classification by Robson (1997), the major factors from the micro environment that affect strategy development are Government, Technology, Market structure, and Demand. As shown in figure 2.30, Government, which is a major player in the macro environment as well (Collin 2004, Jeyarathmm 2008, Rao and Subba 2010), affects strategy development when considering micro environment related tools. Unlike the political role played in the macro environment, Robson (1997) justifies the roles played by Government in the micro environment, as a supplier to some businesses, as a competitor, and as a consumer. The Government makes legislation as well on the industry, which affects product or consumption of products (Robson 1997). The next factor is Technology. Like Robson (1997), Efrat and Shoham (2011) suggest that technology has a huge impact on strategy development of an organization. However, this impact according to Efrat and Shoham (2011) is only on strategy development in manufacturing companies.

This conclusion however does not seem reasonable, as it is generally assumed that all businesses are affected by technology relevant to them. According to Robson (1997), the level of technology, possibility of change, cost structure, and dependence upon certain raw material are technological factors to be considered in strategy development. Market structure (Dibrel et al. 2015, Efrat and Shoham 2011, Lisboa et al. 2011, Mazur and Strzyzewska 2010, and Ward et al. 1995) and demand-unlike technology- influence strategy development in both manufacturing and service companies. Market structure according to Robson (1997) deals with the barriers to entry or exit, the product characteristics, and size of suppliers and competitors. Competitors are also considered in demand, but rather than size, their nature affects demand factors. Demand is also characterized by the size distribution of customers, and growth of existing market. Customers are said to affect the choices for innovativeness in strategy development (Lisboa et al. 2011).

The customers affect strategy development in both manufacturing and service companies (Demirguc et al. 2006, Dibrel et al. 2015, Efrat and Shoham 2011, Lee 2008, Mazur and Strzyzewska 2010, Moon 2006, Wagner 2015, and Zhou and Li 2010). There is a link between demand factors and market factors. Competitors are to be considered in strategy development of both manufacturing and service companies (Dibrel et al. 2015, Efrat and Shoham (2011), Lee 2008, Lisboa et al. 2011, Mazur and Strzyzewska 2010, Wagner 2015, Ward et al. 1995).

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Figure 2.23: Key Dimensions of Task Environment (Adapted from: Robson 1997)

Pearlson and Saunders (2010) agree with Robson (1997) that the analysis of the task environment helps in the identification of key environmental forces and competitive position. By understanding the roles each of the elements play, Pelt (2010) states that organisations can decide to choose focused, differentiated, or cost leadership strategies. Grundy (2006) and Pelt (2010) suggest the need for recognition of substitute products when developing strategy, as they limit the growth of the industry, and set ceilings on prices. Covin and Slevin (1990) showed that industry forces have a major impact on firm strategies. According to Covin and Slevin (1990), companies must adopt a more dynamic strategy to defend themselves against industry structures and increase their market share.

2.6.4 Internal Drivers of Business Performance

Considering internal factors, Efrat and Shoham (2012), assert that they have no short-term impact on business performance, except market knowledge. Furthermore, Efrat and Shoham (2012) suggest that the impact of both external and internal drivers declines over time, leaving companies with a more stable environment. Technological turbulence on the other hand creates an unstable environment for organizations but helps them achieve competitive advantage by decreasing the likelihood of imitation of the services and products by other firms. Like Efrat and Shoham (2012), Dibrel et al. (2015) state that businesses are faced with rapid changes in technology, customer taste, and need to get new products faster to customers. Several similarities exist between drivers of business performance of Manufacturing companies and those of Service companies. This can be seen in results from Mazur and Strzyzewska (2010), who used a range of industries for a large-scale research, which involved a mix of Manufacturing and Service companies in conducting their research on business performance drivers. For instance, Mazur and Strzyzewska (2010)classify marketing effectiveness as one of the drivers of business performance for businesses. This finding is similar to that of Lynch et al. (2012) whose research was in service companies, and Efrat and Shoham (2012) and Chatzoglou (2014) whose studies were in manufacturing companies, marketing effectiveness is found to have a high impact on business performance. Another instance of such similarity is that of management capabilities, which Mazur and Strzyzewska (2010) identified as an internal driver, alongside (Benson-rea et al. 2013, Bock et al. 2012, and Efrat and Shoham 2012) whose studies were in Manufacturing companies, and (Marr et al. 2004, and Ziglan et al. 2007) whose studies were in Service companies.

However environmental factors identified by Mazur and Strzyzewska (2010) were found by other authors to relate with Manufacturing companies or Service companies. For example, Marr et al. (2004) and Zigan et al. (2007), whose studies were in manufacturing companies, show that incorporating operational activities into knowledge-related activities, is an internal driver of business performance. It is possible that this applies to service industries; however, studies found did not identify any relationship between incorporating operational activities into knowledge-related activities, and business performance. Incorporating strategic activities into knowledge processes on the other hand was found by Ziglan et al. (2007), Chatzoglou (2014), and Marr et al. (2004) to be internal drivers in manufacturing companies, and by Lynch et al. (2012) and Miles and Russell (1995) in Service companies. Considering the studies were carried out by these authors in both industries, it is clearly a driver in both industries. Mazur and Strzyzewska (2010) identified organizational structure as an environmental driver as well, and it was also found in the Service industry by Wong and Aspriwall (2004) and Lynch et al. (2012).

Organizational Structure on the other hand was found to be a driver in both Manufacturing and Service industries by Dibrel et al. (2015), but only in Manufacturing companies by Wong and Aspriwall (2004) and Lynch et al. (2012). Similarly, technological status, orientation, and infrastructure were found to be environmental drivers in the Manufacturing sector by Chatzoglou (2014), Efrat and Shoham (2011), and Lisboa et al. (2011). The only classification by Mazur and Strzyzewska (2010) which did not correlate with other researchers either in Manufacturing or Service industries is staff involvement.

Staff involvement was stated to be a driver because management capability is not enough to ensure business performance.

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However, other researchers such as Chatzoglou (2014) in the Manufacturing industry, and Ziglan et al. (2007) and Wong and Aspirwall (2004) in the Service industries recognise the importance of staff management, rather than their involvement in business performance. This is probably because it was not a factor recognised in other studies. However, findings by Mazur and Strzyzewska (2010) strongly correlate with other studies on drivers of business performance either in Service companies, or Manufacturing companies, or both. This shows the commonality of relationships that businesses share. The findings also, also show that each industry is unique and certain drivers that apply to one might not apply to the other. For this reason, it is necessary to analyse each industry individually.

Internal Environmental Drivers of Business Performance in Manufacturing Companies

Manufacturing companies which are characterized by their transformation of material to finished goods were studied by Chatzoglou (2014), more specifically on factors that affect Manufacturing firms' performance. Using survey conclusions of previous authors, and questionnaires distributed to Manufacturing companies, Chatzoglou (2014) argues that the factors within the organization that drive business performance are financial structure, Total Quality Management and Supply Chain Management. It can be argued that TQM and SCM are more business concepts than environmental drivers as they are themselves composed of other environmental drivers identified in this research. Financial structure however includes product price, cash flow, revenue generation, and investment decisions. It was also found by Benson-rea et al. (2013) to be an internal driver in manufacturing companies. As expected, it was also found to be a driver in Service companies as suggested by Yang (2014).

This is expected because finance includes cost and profit, which are the primary drivers of business performance. Supply chain management (SCM) however, was found to be an internal driver limited to manufacturing companies by Benson rea et al. (2013). This is not surprising considering the relevance of SCM in organisations. Total Quality Management- which was earlier described as a concept rather than a driver- includes certain elements like customer focus and relationship management, product design and development, and supplier capability (Chatzoglou 2014). Supplier capability does not relate to other studies as an internal driver of business performance. However, customer relationship management is also said to be a driver in manufacturing companies by (Barney et al. 2009, Benson rea et al. 2013, Calatone et al. 2002, Franke et al. 2009, and Mooler et al. 2002). Lynch et al. (2012) and Marr et al. (2004) also suggest that CRM extends to Service companies as well.

Calatone et al. (2002) concur with Franke et al. (2009), who state that customers expect firms to meet their needs and wants in the shortest possible time, and for firms to be able to do so, they need to introduce products on a rapid basis and manage their relationship, making CRM an important competence for companies. On the other hand, product design and development are also said to be drivers of business performance in manufacturing companies by Barney et al. (2009), Benson rea et al. (2013), and Calatone et al. (2002). Dibrel (2015) who conducted their research across a range of industries state that product design and development is a driver in both Manufacturing and Service industry. It is possible that 'product' in this sense could also mean service design. This finding is supported by Marr et al. (2004), Wong and Aspirwall (2004), and Lynch et al. (2012) who assert that quality and newness of company products or Services drive the performance of business. Benson-rea et al. (2013) agree with the argument by Rabobank (2012) that effective management of these drivers with adequate performance management tools will lead to improved business performance.

They argue alongside Mooler et al. (2002), that business size, and networking is also important factors of business performance. Based on their research, Efrat and Shoham (2012) assert that the internal drivers of business environment are the "firms' capabilities", which includes Research and Development Capabilities which was also identified by Lisboa et al. (2011) in Manufacturing companies, and Market Knowledge which Benson et al. (2013) and Calatone et al. (2002) also identified as drivers in Manufacturing companies. Efrat and Shoham (2012) conducted their research in high technology firms, making their findings slightly different from Chatzoglou (2014). High technology firms manufacture technological gadgets, but the findings by Efrat and Shoham (2012) are more specific to them, rather than general Manufacturing companies like Chatzoglou (2014). This however does not prove that it is not applicable to other industries.

Internal Environmental Drivers of Business Performance in Service Companies

Regarding Service companies, Zigan et al. (2007) conducted their research, using semi structured interviews involving hospital managers. Zigan et al. (2007) reveal that drivers of performance include knowledge, human capital, relational capital in management, and individual performance management. They describe them as intangible drivers of business performance. Similarly, Marr et al. (2004) conducted a research in Service companies, and identified knowledge as a performance driver, but includes brand, patents, and customer relationship management. Lee (2008) is also of the opinion that to gain competitive advantage and improve business performance, knowledge of external drivers is important.

Lee (2008) argues that information and knowledge are required through every phase of decision making.

Companies need consumer and competitor orientation, and this can only be gained through knowledge. Based on this, Eisenhardt and Martin (2007) argue that businesses need to adapt to changing business environment, by building and integrating, and reconfiguring their internal skills and abilities. Atauahene-gima (2005) proposes that this could be done by either exploring new ideas or exploiting existing capabilities of the company. To satisfy customer needs, product development and innovation are crucial to the firm's survival (Yakinkaya et al. 2007). Marr et al. (2004) also identify them as intellectual capital and intangible assets, and if managed well, create value for the company.

Both studies prove that the internal drivers of business performance, especially service companies are the intangible capabilities of the organization. Internal capabilities however are not sufficient drivers of business performance, considering tangible drivers such as money exist. Marr et al. (2004) and Mazur and Strzyzewska (2010), Wong and Aspriwall (2004), and Zigan et al. (2007) explain internal drivers obviously need to be carefully understood and can be used to better react to external business environmental drivers. According to Wong and Aspriwall (2004), it works with other internal drivers such as ownership and management, business structure, business culture and behaviour, human resources, and systems, processes and procedures. Lynch et al. (2012) who identify factors such as marketing, product orientation, customer relationship, culture, and style of organizations as internal business drivers, cite Liu et al. (2003), who state that understanding these factors enables the management to make better and informed decisions. All departments need to understand business orientation to guide business strategy.

Findings by Lynch et al. (2012) correlate with Christopher (2005), and Gilmore and Lindsay (2010), who also argue that managers need information and knowledge in dealing with pressures from external and internal environments, to respond positively to the changes. Piercy et al. (2010) justify this by stating that the changes in the business environment often cause changes in customer needs and market demands, and this will require changes in business strategy, if not the company can fall into long term decline. Harperberg and Rieple (2001) and Piercy et al. (2010) are also of this opinion. The dynamism of business environment is one that needs to be handled effectively and efficiently. The environmental drivers in the previous figure are split into internal and external drivers. Figure 2.24 illustrates factors identified by researchers comprising internal drivers of business performance are illustrated. Colour codes are used in identifying those that relate to Service companies, Manufacturing companies, and both Service and Manufacturing companies. The numbers represent the studies that identify them as drivers of business performance. From figure 2.24, some internal drivers are unique to only Manufacturing companies.

However, environmental drivers of performance in Service companies also affect Manufacturing companies. It can also be seen that some drivers are more common or known in business than others. This does not mean that factors such as business size or staff involvement, supply chain management or research and development do not affect business performance. It is possible that they are just not given as much attention in research as the more common ones such as business culture, business organisation, management experience and involvement, customer relationship management, and incorporating strategy in knowledge management.



Figure 2.24: Internal Drivers of Business Performance.

Manufacturing and Service (M and S)

 (M and S) Mazur and Strzyzewska (2010)

Manufacturing (M)

- 2. (M) Chatzoglou (2014)
- 3. (M) Efrat and Shoham (2012)
- 4. (S) Lynch et al. (2012)
- 5. (M) Benson rea et al. (2013)
- 6. (M) Bock et al. (2012)
- 7. (S) Ziglan et al. (2007)
- 8. (S) Wong and Aspirwall (2004)
- 9. (M and S) Dirbell et al. (2015)
- 10. (M) Lisboa et al. (2011)
- 11. (M) Calatone et al. (2002)
- 12. (S) Yang (2014)
- 13. (S) Mooler et al. (2002)
- 14. (M) Franke et al. (2009)
- 15. (M) Barney et al. (2009)
- 16. (S) Marr et al. (2004)
- 17. (S) Miles and Russell (1995)

Impact of Internal Environmental Drivers on Strategy Development Processes

Strategy development is affected by the internal environment as much as the micro and macro environment (Johnson and Scholes 2005). In table 2.3, Robson (1997) summarizes the key areas in the internal environment that affect strategy development. These areas are integral to the success of strategy.

Key area	Dimensions		
Product/market	Share of existing markets		
	Range of products		
	Position in product life cycle		
	Dependence upon key product for sales/profits/cash flow		
	Distribution network		
	Marketing and market research		
Production	Number, size, location, age, and capacity of plants		
	Specialization/versatility of equipment		
	Production and costs levels		
	Cos/availability of raw materials		
	Production control systems finance		
	Present asset structure		
	Present capital structure		
Finance	Access to additional equity and debt finance		
	Pattern of cash flow		
	Procedures for financial management		
Tashnalagu	Currency of production methods and products		
rechnology	Research and development spending and effectiveness		
	Organization structure		
Organization and human resources	Management style and succession		
	Staff development policies		
	Management/labour force relationship		
	Reward structures		

 Table 2.3: Key Areas in Managing Internal Environment (Robson 1997)

2.7 Dynamism of Business Environmental Drivers

Businesses have to manipulate environmental drivers to achieve their goals, depending on the nature of their operations. For instance, Demirguc-Kunt et al. (2006) argue that companies in countries with good financial and legal institutions have better performance levels than the others.

A company that finds itself in an environment with poor financial and legal institutions will have to carry out more intense strategic analysis to discover the best way to achieve balance in entrainment or strategic fit, using environmental threats to work in their best interest. Therefore, companies have to assess their environments in relation to their capabilities, operations, and their position in the industry (Lenidou et al. 2013). Business environment is dynamic, and this nature directly or indirectly affects business operations and performance (Johnson and Scholes 2002). This makes considering the environmental factors necessary for strategy development and measurement in manufacturing and service companies.

In an uncertain business environment, the ability to strategically adapt is critical for the sustainability of firms (Lynch et al. 2012). According to Beckett-Camarata et al. (1998), this requires the alignment of corporate strategy with the environment, to enable the identification of environmental opportunities and threats, to turn this threat to their favour. Narayanan and Nath (1993) state that organisation need to align their strategy with the environment, to avoid the problems that will face the organisation despite the amount of changes they try to make. However, Lynch et al. (2012) suggest that, at the rise of problems due to non-alignment of strategy and environment, companies can still recover by changing their strategy and changing their business orientation. This obviously requires skilled strategy management- development, and measurement.

Because of the uncertainty and complexity of an already highly competitive environment, the need for allowing strategic customer participation in product and service design on all levels of interaction with business arises (Beckett-Camarata et al. 1998). The reason for this lies in the argument by Liu et al. (2003) that when shifts take place within the business environment, customer needs and market place demand more than other drivers, change. Therefore, companies not only need customer and market orientation, but also customer participation because they influence all strategic decisions which guide the firm internally when responding to changes within the business environment (Lynch et al. 2012). Customer participation also serves as a solution to the problem pointed out by Tse et al. (2003), that it is unrealistic for firms to be marketing-oriented, because it is no longer possible to keep up with erratic and constantly changing demand and market developments.

Judging from different studies, the major ways of surviving the dynamism, and uncertainty of the business environment, is for companies to have business orientation on all environmental drivers (Bolgar 2009, Dibrel et al. 2015, Harperberg and Rieple 2001, Liu and Xu 2008, Lynch 2012, Piercy et al. 2010), and, entrainment of internal processes with external environment (Baker and Sinkula 2005, Brown and Eisenhardt 1997, Dibrel et al. 2015, Jennings and Zandbergen 1995, Lenidou et al. 2013, Perez-Nordtvedt et al. 2008), and innovativeness in product and or Service development

(Atauahene-Gima, 2005, Chang et al. 2011, Dibrel et al. 2015, Jansen et al. 2006, Sorensen and Stuart 2000, Zahra and Bogner, 2000).



Figure 2.25: Surviving the Dynamic Business Environment.

Figure 2.25 illustrates how companies can achieve business performance, despite the different scenarios or changes in environmental drivers. In both scenarios, innovation, orientation, and entrainment lead to improved business performance.

2.7.1 Achieving Balance in Entrainment (Strategic Fit)

Dibrel et al. (2015), suggests that when firms entrain their internal organizational processes to the economic, competitive and or institutional pressures of their external environment, performance benefits may result. This is also considered by authors such as Brown and Eisenhardt (1997), and Pérez-Nordtvedt et al. (2008). However, Lynch et al. (2012) warn that if a firm becomes too internally focused it is in danger of missing opportunities that arise from changes within the external business environment. There needs to be a balance, which could be achieved from appropriate strategic analysis.

Eisenhardt and Martin (2000) state that regardless of their nature, resources are not productive on their own, but rather must be assembled, integrated, and managed to form organizational capabilities to address external environments and meet changing market demands. Lenidou et al. (2013) further argue that firms can achieve a competitive advantage by constantly reconfiguring or recombining different types of resources that can alter existing capabilities or generate new ones.

Sustainable competitive advantage may not last forever, since unanticipated changes in the economic structure of the industry may reduce the value of a certain resource and/or capability and thus minimize its contribution as a source of competitive advantage, therefore Lenidou et al. (2013) argue that to reach the full competitive potential of its resources and capabilities, the firm must be able to manage its business processes effectively and efficiently.

According to Niemann-Struweg (2013) the organization must learn from its environment to position itself according to external needs. Doing so enables the entire organization to think strategically and create synergy by sharing its knowledge and ideas and fostering actions that are in the interests of the organization. Niemann-struweg (2013) explains that this implies that there should be an overall acceptance and awareness that the organization is functioning in an environment where changes are taking place. This also requires, very importantly, that relevant resources be allocated to deal with the changing environment resources for the various functions of the organization pertinent to the new millennium in which new approaches to communications are required, especially in terms of new modes of communication.

Thus, the ability to develop and sustain a competitive advantage in highly dynamic environments can be facilitated by creating 'first-mover' advantages and resource position barriers that affect the competitors' ability to develop substitute resources and capabilities (Baker and Sinkula 2005, Jennings and Zandbergen 1995, Lenidou et al. 2013). Dibrel et al. (2015) provide a solution to managing unstable business environment. According to Dibrel et al. (2015), there is a positive relationship between external entrainment and a firm's innovativeness. Entrainment is the alignment of organizations activity cycles to match those of its external environment, increasing the firm's innovativeness and performance. Therefore, internal capacity of organizations should be aligned with external drivers to manage the unstable business environment.

Yli-Renko and Janakiraman (2008) proffer a solution to achieve customer satisfaction and allow businesses meet customer related need. Yli-Renko and Janakiraman (2008) state that it is important to involve customers in all phases of idea generation, development, and testing of products and Services, either as information sources or co-developers. By continuously doing so, the customer aspect of external drivers will be adequately managed and will have a positive effect on business performance. This is how usability is relevant to achieving strategic fit. This view aligns to Porter (1980), the business strategies should conform to production strategies manufacturing companies to reflect the firms' environment and performance.

The Figure 2.26 summarises the impact of environmental drivers on business performance. Figure 2.26 illustrates how business performance can be achieved despite the dynamism of the business environment.

The internal capacity of the company, which consist of the organisations resource and competencies- if well applied, help in minimizing threats form the external environment. Form the figure 2.26, the research suggests that the Macro environmental drivers pose higher threats to the business, than the micro environment.



Figure 2.26: Impact of Environmental Drivers on Business Performance.

It is most likely that researchers have not paid more attention to factors under competitors, market, and technology, because they are not relevant to their research. In the course of further research, it is likely that they can be found. However, these drivers are as important as customers.

The research also suggests that competitors and customers affect organisations' explorative capabilities, while customers affect the exploitative capabilities.

However, there is no mention of how market, technology, and macro environmental drivers affect either explorative or exploitative capabilities, or both.

2.7.2 Knowledge Management and Innovation as Measures of Business Performance

Lisboa et al. (2011) argue that organizations with improved customer orientation have exploitative and explorative capabilities which improve current and future performance respectively. However, Lisboa et al. (2011) further argue that competitor orientation gives organizations exploitative capabilities which improve only current performance. According to Lisboa et al. (2011), improved customer orientation strengthens firms' presence in the market, by involving customers in all 3 phases of idea generation, development, and testing of products. Companies should be able to find where their strength lies, and what should be improved on. Like Lisboa et al. (2011), Mazur and Strzyzewska (2010) state that application of market orientation and learning innovation together follow customer expectations and enable companies to lead the market. Mazur and Strzyzewska (2010) are also of the opinion that managers with higher levels of knowledge orientation on customers and competitors especially, facilitate information flows, support employee development, encourage risk taking and experimenting, and include staff in strategic and operational decision making. Mazur and Strzyzewska (2010) further assert that the level of companies' knowledge orientation in Service companies is higher than those of manufacturing companies.



Figure 2.27: Innovation Model (Deesomlert and Samwong 2013)

Sandeep et al. (2014) state that the measure of performance could be objective or subjective. Subjective performance measurement is common practice (Sandeep et al. 2014). Deesomlert and Samwong (2013) emphasize the importance of knowledge as a factor of production in organisations and is illustrated in figure 2.27.

According to Erden et al. (2014), the positive relationship between knowledge management and business performance makes it a measure of business performance considering the significant relationship with profit. This is similar to innovation. According to Deesomlert and Samwong (2013), market orientation directly influences service innovation and indirectly influences business performance through service innovation. In addition, service orientation directly influences service innovation and indirectly influences business performance through service innovation. Finally, organizational factors directly influence service innovation and indirectly influence business performance through service innovation.

2.7.3 Effect of Strategic Fit on Effective Knowledge Management

According to Chen and Liag (2011), the strategic fit theory was originally proposed in Thompson (1967) that regards organizational strategy as an organizational process to fit the environment. That means, a good strategy should fit the external environment in order to gain competitive advantages and to cope with the environmental uncertainty. According to Dibrel et al. (2015), modern business environments are increasingly characterized by rapid technological innovation, quickly changing consumer tastes, and the need to reduce the time to get new products and Services to consumers. As a result of this, business orientation of more than one environmental factor is required to respond to the dynamism of business environment (Lynch et al. 2012).

Lynch et al. (2012) suggest that organisations with one dominant business orientation may find it more difficult to effectively adapt to changing market conditions. However, Kotler (1994), and Miles and Russell (1995), argue that one Business Orientation will always dominate all others. What seems to be most important is the manner by which the knowledge companies have is used, despite the areas. Considering the necessity to survive in the business environment however, Piercy et al. (2010) agree with Bolgar (2009), who suggest that developing the appropriate business orientation to face the dynamic, fast-changing, and often uncertain conditions of the business environment presents an arduous task for managers of firms. Haperberg and Rieple (2001), Liu et al. (2003) and Piercy et al. (2010), argue the reason for this to be that changes in the business environment bring about different ways of strategic thinking. This in turn led to new ways of operating, which necessitate serious re-consideration of the firms' Business Orientations.

2.7.4 Effect of Strategic Fit on Successful Innovation

According to Deesomlert and Samwong (2013), product innovation is changes in the things (products/services) that a firm offers. Process innovation is changes in the ways in which they are created and delivered. Because services are produced, consumed, and co-created in real time and often involve interactions between employees and customers, it is critical that innovation and new service development processes involve both employees and customers. Innovativeness occurs as organizations engage in, and support, new ideas, novel techniques, experimentation, and creative processes to produce new products, Services, or technological processes (Dibrel et al. 2015). Kock et al. (2011) suggest that innovativeness of a company is a useful capability in adapting to changes in markets, technology, and competition and are viewed as an especially important competence for organizations coping with potentially hostile environment.

Dynamic environments are attributed by high-velocity changes in technological conditions, irregularity in the behaviour of customers, and turbulence in markets conditions (Chang et al. 2011; Jansen et al. 2006). Firms operating in dynamic environments are placed under pressure by such conditions to develop new products and Services in order to suit customers' changing demand (Atauahene-Gima 2005; Sorensen and Stuart 2000). According to Chang et al. (2011) dynamism encourages firms to provide new products and to strengthen their technological capabilities by following new market opportunities. Dibrel et al. (2015) further argue that a firm that can introduce an innovation faster than its rivals may achieve greater success.

Dibrel et al. (2015) suggest that organizations should have monitoring and evaluation systems in place in order to recognize and react to changes in the external environment. By creating or increasing this capability, it may be possible to cultivate a strategic competitive advantage over less temporally-aware rivals, and more generally to increase an organization's strategic flexibility to adapt to a changing environment. Chang et al. (2011) propose that in dynamic environments, companies should pursue explorative innovations because of the nature of the pressures that environment conditions place on firms' growth and performance. According to Zahra (1996), firms need to develop explorative innovations to explore beyond current products and markets and to capture new revenues from existing and promising markets. In dynamic environments, explorative innovations create opportunities for firms to secure superior financial performance by targeting market segments as first movers and then blocking competitors' entry (Zahra and Bogner 2000).

Slotegraaf and Pauwels (2008) argue that the chances of obtaining long term benefits from temporary market actions are slim. According to Shockley and Turner (2016), companies can ensure long term innovation in two ways: by being proactive in identifying entrepreneurial passion in individuals and business units; have long term orientation on innovation policies in order to keep pace with developments leading towards a knowledge society.

Siekerka (2015) suggests having an innovative ecosystem where research and high-tech operations can flourish. According to Siekerka (2015), this can be achieved by open innovation, through strong partnerships between academia and business, financial support and aggressively recruiting top talent. Companies should gear their strategies towards meeting market needs over time. Based on this, innovation is an element considered in the design of the model for strategy measurement in this research. Incremental and radical innovative companies are distinguished by various factors and have different outcomes in the goal of being innovative Norman and Verganti (2014).

The use of existing technology, with low uncertainty, focusing on cost or feature improvements in existing models, enables incrementally innovative companies improve competitiveness within the current market Zang et al. (2014). However, radically innovative companies create dramatic changes that transform the existing market or create new ones by their ability to explore new technology, focus on models with unprecedented performance features, and work with high uncertainty Sheng and Chien (2016). Defining innovation as the intentional introduction and application within a role, group or organization of ideas, processes or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organization, or wider society, Fischer et al. (2014) explains that the difference in outcome is based on the degree of novelty in the race of radical versus incremental innovation.

According to Romijn and Albaladejo (2002), little efforts yield little novelty, which is the case with incremental innovation, based on the similarity of a product to other products. Subramaniam and Youndt (2005: 452) define incremental innovation as "innovations that refine and reinforce existing products and services by which a company can adapt to changes in the market by generating a certain number of innovations to move with it." Camison-Zomoza et al (2004) define radical innovation as fundamental changes in the activities of an organization or industry with respect to current practices, posing new climate for personal initiative and innovation questions, developing new technical and commercial skills, and new ways of resolving problems.

2.8 Usability

2.8.1 Justification for the Application of Usability outside Software Products

The definition of Usability relates to product quality in terms of software engineering, having "a set of attributes which bear on the effort needed for use and on the individual assessment of such use by a stated or implied set of users" (Bevan, Carter, and Haker 2015). Quesenbery (2004) adopts this formal definition, and clarifies some confusion that may arise from the definition. According to Quesenbery (2004), Usability is a large concept, and could therefore be applicable in more than one context. For instance, Quesenbery (2004) applied the concept in terms of software products and web applications, acknowledging the possibility of use in any other project that can be created and meets the needs of individuals who use it. However, the concept of Usability has been studied beyond software products and user interface. For instance, a design research by Hasdogan (1996) was conducted on household products.

The research elucidated the role of user testing models in the design process of household products, and the assessment of user needs to determine the benefits and limitations of a range of user models that are relevant for design practitioners. Despite the software application, Quesenbery (2004) also recognises that the concept of Usability could be applied in terms of: a quality of the final product; a process for creating usable software; the specific techniques used to achieve that result, and; a philosophy of designing with people in mind. Margolin (1997) who also conducted a design research, and emphasised the need to relate products to users to meet user concerns, referred to manufactured products in this research on user-experience. Margolin (1997) described products in this research as all material and immaterial array of objects, activities, services, and environments that fills the life world.

Material objects according to Margolin (1997) include objects such as automobiles, and immaterial objects could include a code of income tax regulations.

According to Margolin (1997), objects, whether material or immaterial, have interfaces that users engage with to make use of the product, and involve 'use', manifested in complexity, access, interpretation, previous experience, learning time and relation to human well-being. Margolin (1997) suggests that product development requires a combination of methods and user-experiences, and suggests the need for a new theoretical model to help use the power of collective experiences to create a product 'milieu'/environment that can better represent desires for a satisfying world. According to Margolin (1997) little attention has been paid to product milieu, but has rather concerned themselves with consumption than the issues of use. Babbar et al. (2002) acknowledge the concept of Usability was intended for ergonomics, and has been used and is still being used in that manner, however, Babbar et al. (2002) acknowledge the increasing recognition of product Usability in design studies by authors such as (Edder 1995; Hasdogan 1996; and Han et al. 2000; Hofmeester et al. 1996; Jordan 1997; Logan 1994; March 1994; Nagamachi 1995).

Babbar et al. (2002) conducted studies in operations and production management, and demonstrated the need for product Usability. Product in this sense included both electronic and non-electronic products, covered under the term 'manufactured' products. This ranges from candle sticks to microwaves, as used in their research.

In more details, this makes Usability relevant in manufacturability, technology, development time, safety, packaging, distribution, disposal, recycling, and environmental impact according to Babbar et al. (2002). The justification for this was the need to deliver technical excellence to fit the practices, activities, and context of consumers. Peter and Bevan (2009) also apply the concept of Usability with electronic products, services, and environments. This was because just like software products, these are also systems, provide or require information for use, or are interactive.

Han et al. (2000) also relate consumer electronic products to software products, identifying that they also have user interfaces, making Usability an important design issue. Based on this, any product with an interface requires Usability studies. Another instance of the application of the Usability concept beyond software products is the research by Strawderman and Koubek (2006) in health care. The research evaluated the service quality and Usability of a student health clinic. This involved the modification of SERVQUAL to develop a measurement tool termed SERVUSE. According to Strawderman and Koubek (2006), the concept of Usability is applicable to any entity that has a system with measurable characteristics. The oddest application of the concept of Usability outside software products studies was by Windlinger et al. (2016).

They applied the concept in the measurement of workplace and workspace experience, exploring the content and implications of Usability in terms of usefulness and user friendliness.

Aalto et al. (2017) also applied the concept in evaluating hospital buildings, and the impact of certain characteristics on the Usability of work environments for hospital renovations. The Usability of the facilities and workspaces were evaluated by orientation, layout solutions, working conditions, and spaces for patients. Wallace et al. (2013) conducted recent studies, assessing the Usability of cell phones, categorised as electronic products, and compared the Usability in four countries, considering cultural dimensions. Kuuijk et al. (2007) considered Usability in product development, acknowledging the considerable maturity of Usability in product development practice. According to Kuuijk et al. (2007) however also add that there is a gap between theories on Usability and the effective integration of theories into practice, consequentially; current literature does not provide a coherent insight into the practice of Usability in product development. Han et al. (2000) acknowledges that it is inappropriate to apply the same concept of software Usability developed in the HCI research directly to the consumer electronic products, agreeing with studies by Han et al. (1998) and Kwahk et al. (1997).

The reasons for this were the difference in user interfaces of software and electronic products, and users are concerned with Usability in terms of image and impression and not just performance.

Based on this Han et al. (2000) suggests the concept of Usability be developed to suit the nature of electronic products. These few studies prove that the concept of Usability and usability testing has been applied in other numerous areas outside software products studies. Usability is used and will continue to be used in many other ways outside software and human factors. This research shows how the applicability of usability testing principles in manufactured products, and services can be translated when measuring the appropriateness and outcomes of customer-centric strategies. The choice of usability is based on the need for good user-experience to achieve customer-centricity. User-experience (UX) plays a major role in achieving good customer-experience, and customer-experience is critical for customer-centricity.

2.8.2 User-experience (UX) vs Customer-experience (CX)

According to Lowden (2014), UX deals with people interacting with a product and the experience they receive from that interaction. Usability differs from user-experience according to Bevan, Carter, and Haker (2015) in the sense that usability focuses on observed effectiveness and efficiency, while user-experience focuses on user's preferences, perceptions, emotions and physical and psychological responses that occur before, during and after use of a product or service.

Customer-experience is defined by Cao (2017:1) as "every step of the journey from when users are running price comparisons, to when users try the product, to when users may resort to customer service if their needs are not met." This makes customer-experience a broader concept than user-experience as found in this research. Meyer and Schwager (2007) define customer-experience as the internal and subjective response customers have to any contact (direct or indirect) with a company. Similar to findings by to Zomerdijk and Voss (2009), customer-experience is a holistic concept that encompasses every aspect of a company's offering. These definitions show that customer-experience and user-experience differ. White (2017) explains that the end user makes use of the product or service, and the customer buys the product or service.

According to Morgan (2017) and Lowden (2014), user-experience is measurable, and can be measured by abandonment rate, error rate, success rate, time to complete task, and in the case of software products, clicks to completion. Similarly, this research proposes these measures when assessing user-experience with products and services. Lowden (2014) and KPMG (2017) state that customer-experience can be measured in: overall experience, likelihood to continue use, and likelihood to recommend to others. Morgan (2017) adds that customer-experience is measured by net promoter score, customer loyalty, and customer satisfaction. These are the overall goals proposed in this research, and can be better achieved using the targets developed in the research, measured by the user-experience measures. Similarly, according to Cao (2017), UX lies within CX.

Results from the research prove that collective user-experience results directly yield customerexperience results. According to Cao (2017), the customer-experience should be aligned to business strategies with customers' satisfaction in mind, which has been attempted in this research.

According to Effie law et al. (2009:36), UX should not be limited to interaction with a product or an artefact. "UX is more than interactions with products, because users not only interact with services or products but also with the company". Engelbrecht (2016) also shows the importance of UX in CX. This lies in the fact that the end-to-end customer interactions require touch points such as web, mobile, brochures, and human contact (support and service). This therefore deals with information, an aspect of user-experience, based on effectiveness, efficiency, and emotional satisfaction, affecting the quality of relationship with the organisation. CX can be achieved through UX targets. KPMG (2017) suggests that successful UX does not guarantee successful CX, and vice versa. Morgan (2017) however suggests that UX and CX must work together for a product or service design be successful, because they cannot exist and thrive without each other.

2.8.3 Usability Testing for Improving Product and Service Design Strategy

Customer-centric organisations focus on developing and implementing new and innovative strategies compared to non-customer-centric organisations (Deesomlert and Samwong 2013; Toivonen and Tuominen 2009; Ottenbacher and Harrington 2010; Tidd and Bessant 2009), implying the essential role improved user-experience plays in being innovative. Usability testing provides ways for managers to ensure good user-experience through strategic planning and designs based on user-experience, but it does not equal a good user-experience if poorly developed or implemented (Sherman 2016).

In fact, researchers found that strategies in general tend to be inappropriate or poorly implemented (Kaplan and Norton 2006; Netshitomboni 2014; Rajasekar 2014; Raps 2004; Slatar, Olson and Hult 2010). For this reason, this research proposes appropriate targets for the measurement of customer-centric strategies, which could also be used as standards for development and implementation of these strategies to ensure user-experience is improved at all points of interaction with the organisation. Gassmann et al. (2010) relates the era of open innovation to user involvement in product design. This principle has been adopted in industries such as software, electronica, telecom (Chesbrough 2003). User-driven innovation has the longest tradition. Here, well-known examples are the construction and elevator industries (Boutellier et al. 2008, Herstatt and von Hippel 1992) as well as the sports industry (Hienerth 2006). Besides users' systematic involvement in the early phase of innovation, these industries have started to open in all other directions as well Igartua et al. (2010).

Not only has supplier integration's potential been discovered but also the more systematic use of universities and knowledge brokers. User testing deals with real behaviours, observed from some representative of real users (Matera et al. 2013).

A good usability testing could be therefore articulated defining the goals of the test, the sample of users that will participate in the test, tasks and scenarios, how to measure the level of usability of the system, and the needed material and the experimental environment (Lopez et al. 2007, Paz et al. 2016, Segawa et al. 2004). Designs employed by Lu et al. (2009) include user testing, story boards, content diagrams, paper-based prototyping, and high-fidelity prototyping. Their methodology was referred to as an iterative and incremental development model. The prototype is tested through user testing and implemented, after which missing requirements are identified, and the cycle continues until final implementation and release of the product. The planning phase involves a PACT analysis, and identification of users, goals, and requirement gathering.

The analysis phase involved evaluating the original interface, gathering user requirements, and analysing these requirements. The design and paper-based prototype phase involved creating model tasks, creating story boards and content diagrams, creating low-fidelity prototype, and iteratively improving functional and interface design. This involved conducting user tests with 3 students. The implementation and evaluation phase involved creating high fidelity prototype, identifying usability problems, and gathering suggestions on innovation, and iteratively refining high fidelity prototype. This also involved user tests and field tests. Lastly the release phase involved application of the tool to a real-life scenario, and identification of new usability problems and gathering new user requirements.

Cockton (2016) explains that product usability is derived from user-experience, through quality in use. Usability of products covers user-experience and is evaluated using many methods of testing and inspection, most importantly- user testing (Nielsen 2002), and prototyping (Farrel 2015). To accomplish this, some users are recruited and observed individually performing tasks on the design of 'products'. According to Nielsen (2002), five users are usually sufficient for this purpose, at different stages of design. This differs from focus groups and surveys which is more about market research than evaluating usability design (Schade 2016). This implies that usability aims at fitting products and services to customers through observation, rather than fitting customers to products. Designing for users differs from user-centred designs, and usability evaluation (Nielsen 1994). Designing for users on one hand is a design process that utilises knowledge of users' capabilities and goals without necessarily consulting 'real' users. This is often driven by market research knowledge and professes a design focus on end use, rather than system functionality.

User-centred design on the other hand is a technique for deriving user perspectives on a design by actually inviting end users to be part of the design process, either as 'domain experts', as 'ideas generators' or as evaluators of early design prototypes and full products. According to Bonacchi and Perego (2011), designing for users is the basis on which customer-centricity lies.

According to Rohrer (2014) usability in product development requires identification of specified goals, specified approach, and methods of the approach. An instance given by Rohrer (2014), if the goal of the organisation is to inspire, explore, and choose new directions, and opportunities, the approach to strategize could be quantitative and qualitative, using field studies, surveys, data mining, or survey which is argued to be market research tools by Schade (2016). If the goal of the organisation is to inform and optimize designs to reduce risk and improve usability, the approach for execution could be mainly qualitative or formative, using card sorting field studies, participatory design, paper prototype, and usability studies. If the organisations strategy is to measure product performance against itself or its competitors, the approach for assessment should be quantitative or summative, through benchmarking, online assessments, survey, a/b testing, all of which are argued to be market research. According to Schade (2016), usability testing only occurs during the execution of product development rather than strategizing and assessment.

Authors (Jeffries et al. 1991, Jeffries and Desurvire 1992, Karat et al. 1992, Kantner and Rosenbaum 1997, Simeral and Branaghan 1997) have conducted studies, comparing usability testing method is more effective than the other, comparing thoroughness, validity, and reliability. According to Hartson et al. (2003) these studies are baseless, as usability methods depend on the definition of measurement criterions. Tsai (2004) states that no one method is better than the other, considering they serve different needs in different situations. According to Jeffries and Desurvire (1992), the choice of a usability testing method depends on the conditions the method will be applied, as there are limitations to different methods. Andre et al. (1999) states that methods for usability evaluation are not stable, they change because HCI changes. Therefore, when applied to business strategy they change because the business environment changes. Criteria for effective usability evaluation method depend on the usability expert. Koutsabasis et al. (2007) also states that one method of usability testing is not enough in measuring user-experience. Koutsabasis et al. (2007) state that usability testing can be conducted in different ways. The different methods of conducting user tests are identified in table 2.4.

Method	Description
Thinking-aloud Protocol	User talks during test
Question-asking Protocol	Tester asks user questions
Expert explains user actions to tester	Shadowing method
Coaching Method	User can ask the expert questions
Teaching Method	Expert user teaches novice user
Co-discovery Learning	Two users collaborate
Performance Measurement tester or	Records usage data during test
software	
Log File Analysis tester	Analyses usage data
Retrospective Testing	Tester reviews videotape with user
Remote Testing	Tester and user are not co-located during
	test

Table 2.4: Methods of Conducting User Tests (Koutsabasis et al. 2007)

The user-centred tools adopted by Anderson and Braiterman (2001), Lin et al. (2014), and Paninc and Ortlieb (2013) are like those applied by Baudendistel et al. (2015), who implemented usability methods in developing a web-based personal electronic health record.

Their user-centred measurement process involved semi-structured focus groups of user groups identified through PACT analysis- patients, physicians, and representatives from patient support groups. The data were audio and video taped and analysed using qualitative Content Analysis. Finding from their research were used in the development of the tool to enable access to patient data easier by patients and doctors.

2.8.4 Market Research VS Usability Testing

In this section, a range of examples where products have been designed to meet customers' needs and expectations and how they were met are considered, to justify usability testing as more than a market research tool. Two detailed case studies of Strategy Measurement Techniques and Business Performance Outcomes have been provided. The cases studies on usability testing also show how companies applied usability methods in solving problems and implementing strategies. It is also seen to have played a role in the development of some strategies. Here, a few studies from User Focus (2016) are considered. The first case research is a financial institution in need of an intranet to enable employees does their jobs quicker and easier. This is an IT strategy to improve employee productivity. Using personas, the goals, behaviours, attitudes, and demographics of employees were surveyed to classify the different types of end users and analysed using K-means clustering.

A detailed face to face interview and observation of 25 end users was done across various branches of the financial institution. Usability methods were applied in developing and implementing the IT strategy. The findings were summarised in form of task scenarios and personas. This process helped the organisation avoid design flaws, reducing redevelopment costs, reduced support costs, and made employees more efficient. The second case research is Western Union who could improve user support, visual design, navigation, content and functionality by allowing customers to make effective use of their website to transfer money abroad. This is an aesthetics strategy to improve the effectiveness of their website services. Using usability-expert review on English and French versions of the website, the site was assessed against dialogue principles developed by International usability standard, BS EN-ISO 9241-110, Jakob Nielsen's 10 usability principles, and the 187 guidelines for effective web design and usability described in usability.gov's "Research-Based Web Design & Usability Guidelines". They could get a detailed report on the weaknesses and strengths of the website. Usability methods were applied in ensuring the appropriateness of the website for a diversity of users. The third case research is high street bank, which employed the prototyping technique to test the suitability of a hand-held gadget for customers' needs.

This can be classified as an operations strategy. Based on this usability goal of the business, design constraints were defined and alternative devices in the market were examined to incorporate best practices in the prototype design. Paper prototypes of the device were developed and tested with end users. The design and redesign process continued until the usability goals were met. With this method, the bank had a good understanding of their customers and the tasks they would carry out with the product and saved on support cost because the customers were able to achieve their goals without assistance. Usability methods were applied in ensuring the appropriateness of the device for use. Based on three case studies from User Testing (2016), the fourth case research company is Evernote, involved in developing software applications that enable users take, organise, and archive notes. This is a service design strategy. With user testing, user retention was increased by 15%. The goal of the process was to understand customer interaction across multiple platforms. Customers are observed using their platforms and they can identify where customers have difficulty or get confused. This process helps them make more effective products.

Usability methods were applied in assessing the performance of the product/service. The fifth case research is Zillow, an online real estate database company, who could improve user engagement and increase conversions by 8%.

Implementing user testing enabled the company free up time to work on other business critical projects, and gain insights their team relied on to create an engaging user-experience. They were focused on a constant flow of product improvements and new features to enable customers to find their dream home quickly. This can be classified as an innovation strategy. The sixth case research is Pilosophie, who applied user testing to find what people think of their products at early design stage and before release and gain more understanding on user behaviour. This was a product development strategy. They tested to see features that work and those that did not. The company had a team of UX experts who watch the videos of the tests together to interpret the results. Results from their tests are used in explaining decisions to clients on certain aspects the clients do not think are sensible. User testing was also used to quickly test prototypes with real people to gauge whether product iterations were solving problems or creating new issues "Rather than starting with highly specific project goals, the firm and client usually work together to identify an unmet market need and then come up with a solution. It's as much an R&D partnership as it is a traditional agency-client mode" Based on the case studies, the goal of usability testing is to improve user-experience. By so doing, companies can achieve other goals. However, the case studies show that usability is more than just meeting customers' needs.

It is used in reducing costs related to development and support, used in gaining more understanding of customers' behaviour, used in improving company's innovativeness, decision making on product development and service design, make more effective products, identify strengths and weaknesses of products, and achieve goals towards product improvement. Compared to market research, which authors (Nielsen 1994, Schade 2016, Walji and Piotrowski 2008) argue is only a part of the picture of what usability testing is about, usability testing is more than just understanding the voice of the customer. According to Nielsen (1994), market research and usability testing are both integral parts of a product life cycle. While market research is basically about understanding what customers will buy based on what they say, trends, and the market, user testing and user-experience are about very specific, and deep-dive information about what users feel about using a product or service and how to deliver on their wants, as illustrated in figure 2.28.



Figure 2.28: Market Research versus Usability Testing (Quesenbery 2016)

User-experience testing provides deep and focused insight on users' feelings, gotten from small sample sizes through observation such as think aloud protocol and heuristics evaluation (Nielsen 1994). Market research provides a broad insight to users wants based on large sample sizes through surveys and focus groups (Dunn 2009). User-experience looks at how customers make use of a product or service, while market research concentrates on what customers will buy. Therefore, users testing about what users do, and market research is about what users say. Rather than just provide insight to market for a product or competitive price range, user testing provides insight to innovation, designs, and iterations of a product idea. User testing enables companies to understand what motivates buyers (Chavan 2012).

With usability testing, companies can gain one on one insight on customers' experience, enabling them uncover usability issues and make future iterations on the product or service Gandhi (2014).

2.8.5 Standard of Internal Processes Needed for UX Strategy Measurement

A company's internal process can support user-experience strategy development and implementation, thereby improving products or services from customers' perspective, through relevant data gathering and implementation for decision making (Nielsen 2014). Therefore, in developing user-experience strategy, it is imperative to consider- at every stage- the roles involved, actions required, and expectations (Olszak and Ziemba 2010). This requires understanding of how every department in the organisation is affected, including IT department, Finance, Marketing, HR, Customer Support, Sales, Research and Development, etc., as they all should work together to see to the effectiveness of strategy measurement and outcomes (Benford et al. 2013).

The internal processes should be documented (Aula and Markova 2007), and could be illustrated with a diagram, or outlined with bullet points.

By so doing, they can be referred to in future when it is necessary to measure strategy again (Oulanov 2008). This implies that strategy measurement is not a one-time action, rather, a regular process, as stated by Churchova et al. (2016), Johnson and Scholes (1993), and Robson (1997). This review aims at determining the standard of internal process necessary to support the effective use of a user-centred strategy measurement tool. It critically looks at what is needed for user-centred strategy measurement, the breadth of application, and rigour of conformance to the application of the processes. Two major case studies are presented, considering how their user-experience strategy was measured, and the outcomes derived from the strategy measurement process.

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Figure 2.29: Internal Process Perspective (TheCLCI 2016)

Bittner and Zondervan (2015) classify internal processes into operation management processes, customer management processes, innovation processes, and regulatory and social processes, as shown in figure 2.29. Irrespective of the strategy being considered by the company, the internal process for strategy evaluation requires matching operations management processes, customer management processes, innovation processes and regulatory and social processes (Wiele et al. 2002). This framework can aid in the effective measurement of user-experience strategies, by undertaking certain actions (Bittner and Zonservan 2015).

Tyne (2010) states that the standard of internal processes described in table 2.5 required to support effective user-experience strategy measurement involves "creating an attractive, friendly, and easy customer-experience through research, iterative design, validation, and usability testing." This can be achieved through research and analysis, interactive prototyping, and usability evaluation.

Table 2.5: Standard of Internal Processes

		Objective	UX Targets
Internal Processes	Operations management process	Produce and Deliver	Access to product or service Production Efficiency Distribution Effectiveness Risk Management
	Innovation process	CreateNewProductsandServices,andProcesses	Identify opportunity- surveys and personas R and D- open innovation models Design/develop- co-production through user test and prototyping Launch- Marketing
	Regulatory and Social Process	Improve Community and Environment	Environmental Accounting Safety and health regulatory conformance Ethics, informed consent, non-disclosure agreements
	Customer Management	Enhance Customer Value	Efficiency Effectiveness
Customer			Engagement Error Tolerance
Learning and Growth		Reduce Support Cost Reduce Training Time	Increased ease of learning Improved office efficiency Reduced time spent in helping users Improved knowledge management
	Financial	Cost Savings on Errors Cost of Development and Maintenance	Reduced cost Increased revenue

Researching the users and creating personas has also been found to help (Bowden 2015). Through surveys and interviews, personas can be effectively created.

Bittner and Zondervan (2015) argue that the internal process is clearly best combined with financing, learning and growth, and customers. Loranger (2014) emphasizes the importance of users' perception of the success of a product, and organisations' performance in turn. This lies in the fact that user-experience is concerned with everything that affects users and their interaction with the product. This relates to Benford et al. (2013), who show the need for user-experience to be integrated in the jobs of every department, and have a department overseeing it, ensuring that users' needs are considered through every step of product lifecycle, making users the centre of design efforts.

An orchestrated approach across many disciplines and stakeholders must be achieved to create a truly effective user-experience and for the company to thrive. For a product to be truly successful, user-centred design must complement (or even drive) business objectives. (Burgess 2016). User-experience differs from user interface, both of which are usability centred. User interface is about how applications look, while user-experience is about how applications and products work.

In different situations and business types, user-experience strategy and measuring user-experience will differ. Take universities for instance, student experience from websites, library use, classes, social life, opportunities available, etc. make up their experience (Reichelt 2015). In a retail shop, the experience ranges from website use as well, in store help, arrangement of products, checking out, and deliveries. For a manufacturing company, user-experience ranges from the ordering of the products, billing, delivery, use of the product, ability to return, exchange, warrantee, etc. requiring a human centred design as shown in figure 2.30 in the internal process (Burgess 2016).

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Figure 2.30: Human Centred Design (Burgess 2016)

In service design on the other hand, customer-experience should be integrated and linked with the front stage for interaction and back stage to link the customer journey to internal capabilities. Blueprinting service design as shown in figure 2.31 enables the reimaging of interaction of people,

process, and technology, like with knowledge management. Some materials have been removed from this thesis due to Third Party Copyright. Pages

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The internal process application for product and service design involves planning, determining objectives, evaluating alternatives, prototyping, validating, planning, and the cycle continues. Table 2.6 provides detailed explanation of a process application for correcting usability problems found in products and services.

1.	 Plan Determining the areas in product development that require ch departments that could be improved to improve product develop Collaborating within the organization or with external research be Determining alternative courses of action that require measurem the measurement process. Determining constraints that might limit the measurement process as cost, time, location, legal, and ethical issues, and plan towards 	
2.	Context Analysis (Benyon et al. 2005)	 Stakeholder analysis in some cases Brainstorming with pact analysis Mapping out of the analysis
3.	Usability maturity matrix (Hoober 2014, Kirschnok 2014)	 Developing a Usability Maturity Matrix Developing quantifiable metrics for measuring and benchmarking standards Developing a performance metrics, satisfaction metrics, or metrics dependent on whatever the goals may be
4.	Strategy Measurement method (Kirschnok 2014)	 Determining which method is needed for the user-experiences strategy measurement should be determined Bases on quantitative and or qualitative metrics
5.	Usability Testing (Kirschnok 2014, Reichelt 2015)	 Identifying information needed by competitors to complete, sale, and potential sale obstacles like shipping and returns Determining the number of users required Recruiting users Observing them Paying recruits Legal requirements to ensure product information are not leaked Make use of recruitment agencies due to slow and time-consuming recruitment if necessary A lab is also required for the user tests and prototyping Consent forms are also required for the user tests because of ethical issues
6.	Card Sorting (Nielsen 1996)	• Designing intuitive navigation systems, to help users find products they want to buy, and increase sales
7.	Prototyping (Reichelt 2015)	 Paper based, computer based or both, depending on the need or money available
8.	Improve Internal Processes (Bowden 2015)	 Incorporating the same approaches used in improving end user services to internal tools. Conducting research for internal tools, to identify opportunities to do more with less and improve user-experiences all at once.
9.	Cost-Benefit Analysis (Hoober 2014).	• Analysing the relevance of the user-experience strategy employed, considering potential savings, costs that would have been incurred, and costs incurred.

Table 2.6: Process Application

		•	Considering the financial benefits in relation to non-financial aspects as well such as design errors, staff time, operational performance, competitive advantage, and risk management.
10.	Documentation	•	Documenting the process for future measurements. However, this should be done from the beginning of the process

2.8.6 Case Studies of Usability-based Strategy Measurement Techniques and Business Performance Outcomes

Israel Air Craft industries (IAI) and Inland Revenue Service UK conducted a cost benefit analysis of their usability-based strategy management, evaluating the costs incurred, and potential savings during development sales, use, and support. The financial benefits were measured based on the complete implementation of user-centred design. The cost benefit analysis also considered the development time and cost reduced as a result of the usability-based strategy on product development, and future costs as well of updated versions. Other factors such as the increase in competitive advantage, customer satisfaction, and usability ratings were considered in the cost benefit analysis (Usability net 2002). According to Travis (2007), these benefits are expected. In IBM, with a cost of \$20,700 on running 3 iterative tests, the net benefit was \$21,000. An ecommerce site earned an average of \$10,720 monthly based on usability cost of \$5,000.

Basically, user-experience strategy measurement follows similar process of context analysis, for which quality of use measures are developed for measuring satisfaction and performance effectiveness and efficiency which are interdependent. The factors are the basis for user-product interaction and task generalisations, leading to achievement of performance goals as illustrated in figure 2.32. One strategy does not fit all organisations, just as a standard for internal process might not fit all organisations.

Customer relationship for one organisation will differ for another organisation. The process involves starting with users' needs and identifying the users, understanding how they work. Travis (2007) notes that embedding usability in company processes yields return benefits 5 to 10 times the usability cost incurred. It boosts sales online and offline, increases user's efficiency, reduces development costs, and reduces support costs.

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Figure 2.32: Quality of Use Measures Determine by the Context of Use (Bevan 1995)

According to Boag and Boag (2014), methods such as stakeholder analysis enable identification of problems that affect user-experience, making them choose competitions products. Inadequate internal systems affect the user-experience, leading to loss of competitive advantage. Next is to prototype the perfect product and sell the need for a user-centric system to managers. It is necessary to consider the cost of failure and benefits of the user-centred design as well. Most importantly, it is important to have goals or objectives at each stage, with metrics of measurements and targets. User-experience strategy can be measured by comparing the standards to what has been achieved. The goal could be to improve performance, measured by reducing user errors, increasing ease of use, and increasing ease of learning. The goal could be to increase exposure of the product, measured by increasing traffic or user size, retaining users, and attracting users.

To improve credibility, the metrics could be to increase user satisfaction, increase trust in the system, or increase number of visit referral. It could be to reduce resource burden, measured by reduced development cost, development time, maintenance time, redesign cost, support cost, training needed, and documentation cost.

With a goal of increasing sales, the metrics could be increase transaction or purchases and product sales as illustrated in Israel Aircraft and UK Inland Revenue Services. The following subsections describes the usability testing processes for these case studies, and their business performance outcomes.

Israel Aircraft Industries

For Israel aircraft industries, each method adopted in strategy management resulted in development cost savings of between \$5,000 to \$70,000, and a total savings of \$330,000. Based on the total cost of usability of \$22,000, the development cost benefit ratio was 1:15. Sales increased as well to \$400,000, and support cost reduced to \$50,000.

Overall, the cost benefit was 1:29 based on total estimated savings and increased sales of \$780,000. The usability methods adopted were cost effective, considering how lengthy costly and complicated it is to introduce new methods. Firstly, before choosing a strategy measurement tool, its contribution to the development of products was first assed, after which the possibility of integrating them to the development process of IAI was designed. Cost of applying each technique was measured, followed by the readiness of managers and developers to practice the techniques, and the degree of satisfaction from the process, which is important.

Next, a usability maturity model was used, after which managers and developers were interviewed to assess the extent to which each bas practice was carried out. Some methods were selected for trial based on the areas for improvement identified in the usability maturity model, the specifics for the products, the ease of integration with the IAI development process, and intuition on the potential value of each technique. After the application of methods, the benefits were assessed by a pilot group, resulting in positive conclusions. Most of the methods involved 2 to 6 hours with 3 to 6 participants, or a one on one paper or computer prototype by potential users for 2 hours each. It was found that practising these techniques in the early stages of design and development ensured less design mistakes later on. The methods used involved stakeholders' meetings, to identify previously unforeseen users and stakeholders, better understand the product scope and objectives define the success factors and identify some different interpretations for follow-up discussions and resolution.

Involvement of senior managers and marketing personnel contributed for identification of some strategic issues. Context of use was then analysed using a long checklist guided by a facilitator coving many aspects of users' skills tasks, and the environment for use.

Thirdly paper prototypes were used for tasks, where every user function was written on sticky notes and logically grouped, and hierarchy developed. Next, task scenarios were developed for pilots, after which four users evaluated the usability of the product after given 15 minutes training on the product. Fifty problems were found, and a SUMI questionnaire was filled by each user after the evaluation. Usability requirements were then set, where goals and a list of potential user errors were identified. Paper prototypes of screens where developed resulting in a detailed list of 23 user comments, after which style guides were provided to the developers. Next a computer prototype was used, where 97 problems were identified. Lastly user tests were conducted and measured against the usability requirements earlier created.

UK Inland Revenue Service

For UK Inland Revenue service, the usability testing stages involved feasibility, requirements, design, performance measurement, and live running.

In the feasibility stage, workshops were held with stakeholders and a context checklist was used to identify main aspects of the system. Context analysis helps in the producing of task scenarios, setting usability requirements, and designing usability tests. In the requirements stage, the usability of existing system was evaluated. This helped in the identification of problems to be avoided in the design on new systems, and provision of measures to be used as a baseline for the new system. This involved a usability analysis and 7 users evaluating the existing product. Each user was given a short introduction and then observed using the system to do the same key tasks. Comments were captured by a usability analyst which generated a problem list and a report was produced which was fed into the development team before design of the new system began. Next in the requirement stage is the setting of usability requirements involving the identification of the most important strategic effectiveness, efficiency and satisfaction targets for the new product. It also enables the development of targets to be tracked during design and measured during testing. Context analysis was done again to define users' skills, tasks and working environment. Tasks and user types requiring usability requirements were identified. In the design stage, a level of engineering for the design process is provided, by providing workshop participants with information for designing and verifying the IT functions. This involved production of task scenarios, setting usability requirements for each task, and preparation of a pack for each function that collates context analysis, task scenarios, and IT requirements. Paper prototypes were used for user tests.

Performance measurement involved identification of usability problems, and provision of measures on efficiency, effectiveness and satisfaction against pre-set usability requirement. This was done through user observations. Live running enabled the tracking of user satisfaction daily and gaining of feed comments for improvement.

Based on the cost benefit analysis of their methods involving: context of use analysis, set usability requirements, task analysis, task scenarios, preparation pack, paper prototyping, managing issues, using smaller teams, a project glossary, affinity diagramming and style guides, savings on staff time was \$231,000 and cost \$88,500, resulting in a cost benefit ratio of 1:2. Prototyping cost \$51,500, maturity assessments, development and evaluation methods cost \$152,000 resulting in saving in development costs with ratio 1:1.5.

2.8.7 Customer-Centricity

The relationship between customer-centricity and customer-experience can be seen in the definition of customer-centricity by Kobie (2017:2), who defines it as an "approach to doing business in which a company focuses on creating a positive and consistent consumer experience at the point of sale, through the call-centre, online and via all communications, including mobile, email and print."

The relationship between customer-experience and customer-centricity in organisations is also discussed by Fader (2011), who finds that customer-centric organisations are profitable, because being customer-centric requires and improvement in product centric business model to improve customer-experience. Fader (2011) however finds that many organisations that claim to be customer-centric are not.

Reise (2014) suggests that this is due to a number of reasons, such as: inability to link customerexperience strategies to corporate vison and mission; inability to commit key resources to customercentric strategies on a full-time basis; underestimating the criticality of change management; lack of appropriate executive alignment; taking a 'piecemeal' approach to customer-experience management; inability to take an end-to-end approach to customer-experience, and most especially; lacking discipline in measuring results of their customer-centric strategies.

Kobie (2017) also emphasise the need for proper measurement process, which is the aim of this research, stating that success in customer satisfaction cannot be assumed because it feels right, however it must be measurable to matter. To achieve this, Kobie (2017) suggest that organisations be made aware that customer-centricity is an ongoing journey as opposed to a destination.

According to NGDATA (2015) therefore, customer-centricity drives business processes across the enterprise, and therefore should extend to all key departments including marketing, sales, services, product design, and manufacturing, as were included in this research for data collection. Deloitte (2014) find that this lack of inclusion is a major reason behind the lack of organisation culture to deliver truly customer-centric customer-experiences. Bonacchi and Perego (2011) therefore identify the customer-centric architecture to revolve around structure in terms of how organisations function; performance measurement in terms of how organisations define and measure performance, and; how employees are evaluated and rewarded. Deloitte (2014) suggest that in order to embed customer-centricity into an organisation, it is necessary to ensure that customer-focused leadership is visible, customers are understood, experience is designed, the frontline is empowered, the metrics used matter, the back office is engaged, and continuous improvement is driven by feedback.

In order to achieve these, Harvard (2016) suggest the use of an integrated approach by organisations in order to link strategy, vision, organizational alignment, and employee training and empowerment with measurements. To be specific therefore, this research assumes that customer-centric strategies should be integrated into a holistic system, employee performance should be seen as key in the strategy implementation, the standard for measurement should be set at exceptional, processes should be aligned to the metrics, and most importantly, the customers should be the basis and centre of creating a meaningful human cause.

A detailed review of the differences between customer-centric and customer-facing strategies strategy types is important at this point in the text because it informs and supports the development of the conceptual model in figure 5.49. A customer-centric strategy is "the asymmetry or differential in any firm attribute or factor that allows one firm to better serve the customers than the others and hence create better customer value and achieve superior performance" (Shenoy et al. 2012:5). Customer-facing strategies on the other hand involve processes, knowledge, activities, technology, people, and communications that connect businesses to customer-outcomes (Norsight 2017).

Therefore, a customer-facing strategy is any strategy that allows companies view their businesses through the customers' lens at all touch-points; any strategy implemented by companies to ensure interaction with customers is productive, is customer-facing (Markgraf 2017). For instance, providing training for employees is a business facing process, but becomes customer-facing when it is necessary for sales and customer service to represent the companies before the customers. However, customer-centric strategies focus on retaining current customers in order to enhance profit, and gain competitive advantage (Bendapudi and Berry 1997; Reicheld and Sasser 1990).

To ensure this, customer-centric strategies focus on providing positive customer-experience at every point of interaction with the product or service, from design, to sale, to after sale (Manuri 2015). Customer-facing strategies, however, tend to include operations of only customer-facing departments such as sales and marketing to ensure efficient delivery of products or services to customers (Markfraf 2017). With customer-facing strategies, companies are oriented towards convincing the target market to purchase products and services, or complete delivery, however customer-centric strategies are about developing products to meet customers' expectations of purchase, delivery, and use (Norfolk 2011).

A customer-facing strategy may not be customer-centric in the sense that it is not focused on improving customer-experience, but rather customer-facing strategies relate to creating better interactions between customers and the organization (Markgraf 2017). Aligning the customer-centric strategies towards specific performance outcomes like profits, customer satisfaction, customer loyalty and market share that would enable firms in attaining superior performance (Bonachi 2011). Customer-centric companies organise their data and knowledge around their customers (Manuri 2015). This research therefore relates to customer-centric strategies, whether customer-facing or not; because of the logic behind customer-centric strategies, and its relation to usability. Being a research adopting usability methods to enhance user-experience, it is logical to work with strategies aimed at improving customer-experience with products and services in this research.

This is because usability aims at identifying design problems, and improving user-experience with products and services (Nielsen 1994); therefore, can ideally fit better with customer-centric strategies than customer-facing strategies. Furthermore, there is lack of literature on how to ensure effective implementation of customer-centric strategies, or how to measure the success of these strategies (Bonacchi and Perego 2011).

This research will be a relevant contribution, as it majorly discusses strategy in relation to usability and user-experience. Customer-centric strategies include, but are not limited to: Customer Relationship Management (CRM) strategies (Liu and Corner 2007); Knowledge Management (KM) strategies (Moghadam 2014); Product Development strategies (Rocca et al. 2016); Information Technology (IT) strategies (Bermejo et al. 2013); Marketing Strategies (Moghadam 2014); Product Pricing Strategies (Cros and Dixit 2005); Functional Strategies; Operational Strategies (Panagopoulos and Avlonitis 2010); Organizational Strategies (Coviello and Joseph 2012); Sales Management and Distribution Strategies (Tehro et al. 2015); Retail Strategies (Tehro et al. 2015), and; Transformational Strategies (Chamberlain et al. 2015). All of which are relevant to the research, however the strategies discussed in this section are given major attention.

This is because product development strategies form the foundation of design success and errors (Ylimaki 2014). Knowledge management and innovation strategies are considered because they serve as the basis of organisations' success in this research, as identified in objective 2 of this research. IT strategies are important because of the important role IT plays in operations and business outcomes. Lastly, CRM and marketing strategies have customer facing and customer-centric strategies that are important in enhancing experience.

Product Development and Service Design Strategies

Product and service development strategies should go beyond obtaining the voice of customers as a source of information, but including them in the development process (Griffin et al 2013). According to Ylimaki (2014), customer involvement in product development makes the strategy customer-centric. Customer-Centric product development strategies not only make customers the focus of development, but give them the role as co-developers in producing what will improve their experience (Rocca et al. 2016). This strongly relates to the concept of usability, as customers are involved in the design process through user tests and prototyping (Nielsen 1994). Furthermore, customer-centric product development strategy is also linked to knowledge management in the sense that proper knowledge of customers results in more effective product development (Fang et al. 2015). The strong relationship with innovation, knowledge management, and most of all, usability, makes product and service development strategy relevant to the research.

Operations Strategy

Operations strategies relate to both manufacturing and service businesses. According to Drohomeretski et al. (2012), the operations strategy of an organisation is represented in the skills and capacity of workforce, managerial competence, and ability to meet customers' expectations. Drohomeretski et al. (2012) add that operations strategies aim to meet the following goals: quality; reliability; flexibility; speed; cost, and; innovation. According to Shavarini et al. (2012), operations strategies include vertical integration strategies, capacity strategies, facilities strategies, process technology strategies, and product technology strategies. Beckman and Rosenfiled (2008) relate vertical integration strategy to the value chain, and describe it as the most fundamental operations decision. The volume of products or services an organisation can produce during a period of time is its capacity strategy Shavarini et al. (2012).

According to Stevenson (2009), facilities strategies relate to the size and location of facilities. Process technology strategy according to Slack and Lewis (2011) is applicable in the manufacturing of products, and provision of services. Product technology strategy according to Shavarini et al. (2012) refers to the selection, definition, and design of products and services.

Product Differentiation and Innovation Strategies

According to Romero and Molina (2016), customer-centric innovation revolves around customers' needs with the goal of designing a new product or service that delivers on these needs and expectations. According to Christensen et al. (2002), outcome driven innovation is built on the need for successful customer-experience and successful achievement of goals by customers, in order for companies to succeed. Christensen et al. (2002) adds that outcome driven innovation is a customer-centric strategy, and has been found to increase customer loyalty and retention rates. According to Mulligan and Cornican (2016), organizations that adopt customer-centric innovation do not compete based on old traditional business models and structures, but have redesigned their processes and products to be more responsive to their customers and more efficient for their customers. The goal of introducing innovations to enhance customers experience makes product differentiation and innovation strategy relevant to this research.

Aesthetics Strategy

Aesthetic strategy is also referred to as industrial strategy by authors (Gemser and Leenders 2001; Hertenstein et al. 2005; and Veryzer 2005), and differs from manufacturing strategy (Marina 2010). According to Crawford and Mathews (2001); Norman (2004), aesthetics strategies are important because technology is not sufficient to ensure success in innovation. Authors (Gemser and Leenders 2001; Hertenstein, Platt, and Veryzer 2005; Roy and Riedel 1997; Walsh et al. 1992) suggest the use of industrial design in achieving success in innovation. According to Marina (2010), aesthetics bridges the gap between functionality and market opportunities. In service design, aesthetics strategies are displayed in visceral design and experiential design, while industrial design reflects aesthetics strategies (Candi 2006). Also, Marina (2010) adds that functional design is to service development what engineering design is to product development. According to Norman (2004), functional design reflects utility and performance, while visceral design refers to the ability to appeal to human senses. Experiential design according to Stuart and Tax (2004) refers to emotional sociological aspects including culture, meaning, symbols, and message. According to Marina (2010), there is a positive relationship between design and performance in new product development, and can aid in attracting new customers, retaining existing customers, lowering cost, and fostering positive image in the market.

Customer Relationship Management Strategies

Customer-centric CRM strategies are employed to understand the needs of the customers (Liu and Corner 2007), ensure good corporate memory (Seth et al 2000), and give accurate and timely information (Vin 2009), ensure responsiveness to emails, and guaranteed service levels. According to Vin (2009), customer-centric CRM strategies allow companies to make use of CRM systems to directly address the needs of customers.

Customer-centric CRM requires detailed sales analytics, and aims to address the fact that "customer" in some CRM systems is usually forgotten. For instance, a customer interface might not give the customer access to checking the status of an order, affecting customers experience with the relationship (Vin 2009). Customer-centric CRM strategies ensure that relationship management is organized with the goal of ensuring customers have good experience always.

Information Systems/Technology Strategies

Customer-centric IT strategies allow companies to use their IT to achieve the goal of enhancing customers experience in all facets (Chen et al 2010; Shih 2014). Knowledge is important to formulate IT strategies, and IT is important to implement knowledge management strategies (Pai 2006). Bermejo et al. (2013) suggests that the automation of knowledge management and CRM for customer-centric strategies, is in itself an IT strategy. This is based on the definition of IT strategy as the implementation and alignment of IT within an organization to achieve companies' objectives (Shih 2014).
Customer Knowledge Management Strategies

Customer Knowledge Management is a customer-centric strategy (Moghadam 2014). Customer Knowledge Management is important for effective service delivery (WP22 2016), as it enables organizations capture, distribute, and use customer focused knowledge to unlock their value. Knowledge management influences effectiveness and efficiency, which are crucial in ensuring user-experience with products and services (Manuri 2015). Effectiveness and efficiency are two of the major indicators of usability (Nielsen 1994), and their relationship with knowledge management makes the strategy relevant to this research. In numerous applications and channels such as self-service, web chats, social engagement, and email, Knowledge Management ensures speed and delivery of service level expectations, as knowledge is used to meet customer needs. Knowledge management strategies can be used to enhance CRM strategies as well (Vin 2009), by supporting smarter answers and improved decisions by employees (Stefanou and Sarmaniotis 2003). Knowledge management principles are organized around people, process, and technology; to ensure customers are satisfied with the quality of products and services rendered (Manuri 2015). Usability aims at achieving customer satisfaction through enhanced user-experience (Nielsen 1994, Tyne 2010).

The process of creating, sharing, using, storing, transferring, and reusing tacit and explicit knowledge is essential in ensuring the company is customer-centric, and therefore customers' expectations are used as intelligence for growth and competitive advantage (Srisman and Rachta 2014).

For example, companies adopt knowledge management strategies when they store knowledge on how customers' problems were solved, and make this knowledge accessible throughout the organisation for reuse, to make response quicker the next time such a situation arises.

Marketing, Pricing, and Sales and Distribution Strategies

According to Moghaddam (2014:1), "Customer-Centric Marketing Strategies are in line with putting the customer at the core of marketing activities in theory and practice, implementing effective customer-centric policies, providing the leading-edge approaches and concepts of customer-centric marketing, and contributing to the literacy and literature of marketing". Cheng and Dogan (2008) state that customer-centric marketing is different from one to one marketing, in that traditional marketing adopts a product-centric approach by making product the starting point of the planning process and providing a customized product for each individual customer. According to Cheng and Dogan (2008), customer-centric marketing strategies involve customer portfolio management, segmentation, and segment strategy. Product pricing strategy also falls under marketing strategy (Cros and Dixit 2005). Therefore, investment in sales and distribution and marketing, and number of customers are important in assessing the results of companies' marketing strategies.

2.9 Summary and Gaps found

This chapter included a review of literature to show the effectiveness of strategy tools for strategy measurement, and the impact of strategic fit on innovation and knowledge management. First the review noted the need for objective choice processes in selecting strategy analysis tools. Based on this, decision support tools for making choices were reviewed and their applicability to the process of selecting strategic analysis tools was assessed. Some of the tools were found to be relevant, while others were not. The chosen tool was applied in selecting strategic analysis tools that can be used retrospectively in strategy measurement. The relevance and shortcomings of these tools were discussed. Scenario analysis could be applied beyond just the Macro environment only. No specific studies on just manufacturing companies, and just service companies, or both together, were found. However, it was found that some tools are only applicable to manufacturing companies.

Research Question 1

For the first research question 'How effective are existing strategy measurement processes and tools in improving service design and product development', the lack of strategy measurement specific tools was noted, and few strategy development tools that can be used for strategy measurement. Most strategy development tools can hardly be used to evaluate strategy. However, some tools can be used to measure the company's strategy, though they are primarily for strategy development. The same results were found in the internal environment. Frameworks for analysing strategy in the internal environment are basically aimed at strategy development, not strategy measurement.

At the last step of determining strategic position- strategy implementation, strategy evaluation can be carried out using strategy implementation tools such as balanced score card, and strategy maps. These tools are more strategy-measurement inclined than the tools used in developing strategy based on analysis of micro, macro, and internal environment.

Metrics for strategy measurement depend on managers' preference and can be unreliable. The metrics could be more innovation and knowledge management based because they lead to improved business performance. It is also argued that the elements in the scorecard do not cover all necessary areas. It is possible that the scorecard could be more streamlined to services and manufacturing industries specifically, to avoid generalised measures of evaluation. It could also take into cognizance other environmental drivers, both the internal and external environment should be considered, and the nature of strategy and how to measure it. There is lack of specificity in some tools such as Ansoff, Bowman's clock, Porter's generic strategy. Strategy measurement tools could give guidance on what the product of the analysis should be. There could be a ranking of results to help managers rate if their strategy is good or complete. Most important however, the tools should measure the quality of the earnings, rather than the quantity.

Quality experience is characterized by the incorporation of customer knowledge and innovation. These shortcomings are addressed by the Usability-based framework developed in this research as is described in section 6.4

There is no method of assessing the relevance and outcomes of strategy measurement for improving product development and service design. Customer-centric organisations tend to develop and implement inappropriate strategies unable to yield improved user-experience outcomes. This can be attributed to the lack of a research driven framework with user-experience targets that can also guide the development and implementation of customer-centric strategies. Furthermore, strategy measurement tools mostly measure quantity of earnings rather than the quality and mission of the organisation. Having appropriate tools will aid in ensuring the quality of customer-experience is measured, rather than the quantity of earnings. Existing tools also have low impact on organisational learning and restrict innovation. By using innovation and knowledge management as the basis of performance, the tool proposed in this research will ensure innovation and knowledge management are properly represented in business customer-centric strategy. These gaps are addressed by the research-based framework developed in this research as is described in section 6.4

Research Question 2

For the second research question 'How does strategic fit influence the success of an innovation and effectiveness of knowledge management, which serve as the basis for business performance', the need for businesses to understand their environment, to identify, extend, and create new market opportunities has been emphasized. This makes innovation and knowledge critical for business performance in unstable, uncertain, and competitive environment.

It is important for companies to sustain innovation, and by so doing, maintain and manage strategies, leading to sales and profits. Multinational companies deal with more threats from the business environment due to their dealings in multiple countries with varying drivers.

To survive in the business environment, despite the environmental threats, firms need orientation on all the environmental driver, entrainment- merging internal capacity with the external environment, and innovativeness in product development. Some researchers such as Efrat and Shoham (2012), Lisboa et al. (2011) limited their research to an industry on which they based their work, thereby limiting the generalizability of their findings. Some authors such as Dibrell et al. (2015) Mazur and Strzyzewska (2010) failed to address how entrainment strategies influence the success or failure of innovations, and to what extent an entrainment capability is a source of competitive advantage. Beyond suggesting the need for entrainment, authors also left out how to identify the relevant internal processes used in managing the external environment. They also ignored the quality of knowledge processes in companies, while concentrating on their intensiveness. However, the user-centred strategy analysis tool being developed in this research takes these into cognizance.

Based on these, it is necessary to distinguish between methods for surviving in the dynamic business environment for both Manufacturing and Service Companies Justification should be provided, explaining why some environmental drivers such as Research and Development, Market Orientation, business size, technology turbulence, and logistics are unique to only Manufacturing companies, but those that affect Service companies also affect Manufacturing companies. Research needs to be done on staff involvement, labour availability, and social activities in manufacturing and service industries. Methods for determining from the studies if some environmental drivers have more effects than the others should be developed. This follows the problem that all environmental drivers cannot be identified. There are too many in existence, and no laid down method for managing the effects of the changing environmental drivers. It is also important to find a method of creating balance in entrainment, to ensure companies are not too externally focused. A model should be developed to link internal resources directly to external needs of companies, as is the goal of this research.

There is need to determine how a balance in entrainment/strategic-fit and strategies aimed at achieving strategic fit can impact the success or failure of innovations, and knowledge management in manufacturing and service companies. Furthermore, there are fewer studies on staff involvement, staff to customer ratio, social activity, and employee productivity in achieving strategic fit.

This needs to be addressed because employees play a major role in improving customer-experience especially with the use of customer knowledge and product knowledge of course in providing support to customers. Companies have been found to be too internally focused, and thereby not properly aligning their resources to meet external needs. It is necessary to address this because in order to improve user-experience, it is necessary to ensure the people, processes, and technology are available and can be used properly in meeting customer needs. Studies failed to show how the quality of knowledge management processes, rather than the intensiveness, in companies affect the management of the external environment. Also, there is little clarity on the roles of innovation and knowledge solely driving business performance.

Research Question 3

For the third research question 'How can usability methods be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience' the review showed the importance of understanding how the different usability tools can be shaped and applied to suit and fill the gaps identified. Major tools identified include user testing, and prototyping. It was found that user-centred design and measurement techniques have been applied in quite a few areas, but have not been used in developing, implementing, and measuring the appropriateness or outcomes of strategies related to user-experience.

This research sets do discover the targets that need to be considered when measuring the appropriateness and outcomes of these user-experience strategies, which have been found to be customer-centric strategies. The research also seeks to give a balance to products and services as part of ergonomics and industry design. The application of user-experience strategy measurement, just like any other process, requires a standard of internal processes to be effective. Here, case studies were presented showing that the usability techniques can be applied to any type of company, with similar processes, but different specifics. They all require detailed contextual analysis, user tests, prototyping, development of metrics based on users' experiences, and a cost benefit analysis. However, these are just generic statement, unlike strategy development tools or the balanced scorecard which have a format. The application of user-centred strategy measurement could have a more specific framework for strategy measurement, for both service and manufacturing companies. The research sets to propose a framework with a proper format for strategy measurement for customer-centric manufacturing and service organisations.

The need for customer participation in product development has been identified, but not methods or frameworks to guide participation have been provided. UX has been discussed more in the sense of product design-oriented; there are few studies that address it with regards to service design. UX should give more focus to service design as well, not just products. User-experience has been found to rely greatly on customer knowledge for innovation; however, there is no research-based model or framework to guide the measurement of the appropriateness or outcomes of strategies set to achieve this goal.

The next chapter- Methodology- identifies how the aim and objectives will be delivered, and data will be collected to answer the research questions.

Chapter 3: Methodology

3.1 Introduction

The purpose of this research was to evaluate the applicability of usability measures in the process of strategy measurement. To answer the three research questions, it was necessary to collect data from business managers and product users independently. To answer the first research question 'How effective are existing strategy measurement processes and tools in improving service design and product development?' it was necessary to collect data from managers to determine the relevance and shortcomings of existing strategy management process and tools in order to ensure that the framework developed in this research meets appropriate standards, and fills the necessary gaps. The second research question 'How does strategic fit influence the success of an innovation and effectiveness of knowledge management, which serve as the basis for business performance?' also required data to be collected from business managers. This was necessary to ensure the framework developed in this research was geared towards achieving strategic fit. The final research question 'How can usability methods be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience?' requires data from product users. This was to ensure that the framework captures relevant targets for improved experience with products and services, and improved product and service design strategies. The chapter describes the methods adopted in the research to collect data to help answer these research questions and develop the conceptual framework. Each of the methods was justified as to how they aided in conducting the research.

3.2 Research Design

The following material will demonstrate the research design employed, showing a clear route from the key research questions being asked, the evidence which is needed to answer them in whole or in part and the ways in which the evidence will be analysed.

The research design was a sequential multi-phase design (Saunders et al. (2017), implemented for focus and triangulation. Quantitative data are first collected using the questionnaires, to focus on the internal business aspects of the strategy management and strategic fit, in order to answer research questions 1 and 2. Next, the usability tests are conducted in two phases. The first phase (a pre-experiment) involves the collection of quantitative data to define and narrow the nature and scope for the user interviews to aid in answering research question 3. The usability test in phase 2 then involves qualitative data from the interviews in order to answer research question 3.

To effectively achieve the research objectives, the data collection was divided into six stages as shown in figure 3.39 below. The protocol development stage was for developing user testing methods. This involves doing PACT analyses of the case studies, documenting pre-test information, developing usability testing measures for protocol analysis/ think aloud design such as effectiveness, efficiency, learnability and satisfaction, developing metrics for each measure, developing post task questions, developing measures for comparing organisation's strategy to results, and preparing tasks for users.



Figure 3.33: Data Collection Phases

The second stage was for constructing the first version of the conceptual framework to apply usability methods in assessing user-experience and proposing a framework for measuring strategy for product development and service design. Product development and service design referred to in this research includes the use of processes new to the industry, use of processes new to the firms, modification to an existing product or service, and an addition to the production line as explained by (Tohidi and Jabbiri 2012; Vicente et al. 2015).

The strategy tools assessment stage covered the evaluation of existing strategy measurement tools used by manufacturing and service companies in the UK, to determine their relevance and shortcomings. The stage involved the distribution of questionnaires to business managers, to determine the relevance of the tools selected in the literature review in strategy measurement, to aid in answering the first research question. These questionnaires were analysed using descriptive and Factor Analysis, as is discussed in section 3.7.

In presenting the results of the research, the descriptive focus was applied. Descriptive research focus aims at gaining an accurate profile of events, persons and situations.

The descriptive design provided accurate description of observations (Saunder et al. 2016) by business managers in terms of effectiveness of existing strategy tools, and strategic fit. The explanatory design was employed to examine the relevance and shortcomings of existing strategy measurement processes in improving service design and product development. The explanatory focus relates to determining causal relationships between variables by researching a situation or a problem (Collis and Hussey 2013), and this was mostly done through statistical tests in this research. The fourth stage was the strategic fit analysis, to analyse its impact on successful innovation and effective knowledge management. This involved distributing questionnaires to manufacturing and service companies in the UK, to assess the effectiveness of knowledge management in manufacturing and service organisations, and assessing their strategic fit. This stage helped in answering the second research question. The questionnaires were analysed using descriptive and Factor Analysis, and is further discussed in section 3.7. In this research, the descriptive design was employed in collecting data on innovation and knowledge management of manufacturing and service organisations, to accurately describe organisations' performance at this point in time. The purpose was to map the strategic fit of organisations to their performance based on innovation and knowledge management metrics and provide insight for hypotheses formation (Cooper and Schindler 2003). These were analysed using Factor Analysis based on the explanatory design. The explanatory focus was reflected in the analysis of the impact of strategic fit on successful innovation and effective knowledge management as the basis for business performance, and provision of recommendations for improving product and service design strategy.

After this, stages five to seven involved framework modification, usability test phase one, and usability test phase two. These helped in answering the third research question. The framework was modified for the user tests. The sixth stage of the research process involved the first phase of the user tests (pre-experiment). These were analysed using Content Analysis. A goal of this stage was to reduce the number of sectors and narrow the scope for data collection. It was also done in order to identify broad differences between good customer experience, and poor experience. The seventh stage involved the second phase of the user tests to develop and apply usability methods in assessing appropriateness and outcomes of strategy in enhancing products and services for improved user-experience. These were analysed using Template Analysis. The exploratory research allowed the researcher to ask open questions in order to gain insight on users experience with products and services. This research focus was flexible and adaptable to change based on new data and new insights that occur along the course of the research as suggested by Krishnaswami and Satyaprasad (2010). In determining how to improve customers experience through strategy measurement with usability metrics, the exploratory focus was applied.

After the analysis of the questionnaires, user tests, and financial results, the data are evaluated, leading to the modification of the model constructed. The model was modified after it has been validated, leading to the testing in 3 chosen organisations. Interviews are conducted with 32 strategy management experts for validation, after which it was tested in 3 organisations. Findings from this process helped in constructing the final model for strategy measurement based on usability metrics in manufacturing and service companies.

3.2.1 Initial Usability Measures

The aim of the user testing tasks is to measure usability of products and services. It has been noted in the literature review that the operations of companies differ in numerous ways, and providing different services, especially since they exist in different sectors. This makes it unrealistic to apply similar tasks to each company. Therefore, the tasks set for the companies differ. However, the goal of the research is to develop similar measures for organisations to improve user-experience through strategy and this is not constrained by difference in operations of the companies. User-experience refers to the overall experience of a customer with a product or service (Tyne 2010). It is therefore important to understand the expectations of customers from products and services to achieve customer-experience.

Therefore, from the observation of users, it was determined if their expectations of the products and services had been met in terms of purchase, use, and reuse or returns, and every activity within these. User tests are simple yet thorough based on possible activities determined in the PACT Analysis in appendix 5. It is important to note that expectations of users differ, making it necessary to assess the results quantitatively by weighted metrics. Therefore, to achieve the aim of the research, to enable measuring customer-centric strategies to be measured, the following user-testing measures selected from literature and shown in table 3.7 are justified in this section and applied in chapter 5. The user-testing process and stages are described in chapter 5, and the results for both studies are analysed and evaluated.

Usability Goal		Initial Measures	
1.	Efficiency of products and services	 Number of attempts users make on tasks Average time in using a product or service Resources employed in executing tasks 	
2.	Effectiveness of products and services	Easy access to sources availableEase of learning	
3.	Engagement with products and services	 Customer expectations on products meeting their needs Customer adaptability to product Comparison to competition 	

 Table 3.7: Proposed Usability Goals and Initial Measures for Framework Version 1

4.	Error tolerance of products and services	٠	Efficiency of use for the first time
		٠	Access to help or user guide
		٠	Number of errors encountered in accomplishing
			each task
		٠	Response from guide in solving problem

The next four sections justify the usability goals of efficiency, effectiveness, error tolerance, and engagement of users as appropriate measures to aid in assessing the appropriateness and outcomes of a strategy aimed at improving product development and service design. The measures were chosen to deliver on two levels: to aid in assessing the experience of customers with products and services, and; to be assessed and validated as appropriate measures for the appropriateness and outcomes of a strategy, based on satisfaction derived by customers, as seen in their responses and the data collected.

Efficiency

Efficiency measures the speed by which users can complete tasks for which they use the product. It is one of the five quality components of usability as identified by Quesenbery (2011). For this research as shown in table 3.8 below, it is being measured by: Number of attempts on tasks (number of attempts before success), and; Average time in using product or service (time). This is derived from studies (Frokjaer, Hertzum, Hornback 2000; Roed 2014) that prove efficiency as a measure of accuracy, completeness, and resources expended in completing goals, with completion time and learning time as indicators. Product interaction involves communication or reaction between the product and individuals. Peppa et al. (2012) state that interaction is expected to be simple and should not require specialized knowledge or experience to run regular tasks. According to Peppa et al. (2012), product interaction should allow ease of use, speed, provide satisfaction, and be error free. This makes it a necessary outcome of product development strategies.

Therefore, the participation of the user in product development is important to ensure the product is made according to their needs and specification. This thereby appropriately represents efficiency. This will allow users to tailor frequent actions.

	Initial Usability Goal	Initial Measures	Initial Gauge (Units)	Initial product development and service design Outcomes	
1.	Efficiency	Number of attempts on tasks	Number of attempts before success	Droduct interaction	
		Average time in using product or service	Time	Product interaction	
		Resources spent after purchase of product	Money spent after purchase	Resource economical	

Table 3.8: User-Test Efficiency Measures

Hornbaek (2006) identifies mental effort as the major resource, adding that time; usage patterns and learnability are objective measures. Hornbaek (2006) further adds that subjective measures include duration, mental workload, perception of task, and difficulty. Monetary resources are used however because it is difficult considering the scope of the research to measure mental resources. An important resource that matters to customers is money (Docters et al. 2013). According to Dillion (2001) indicators also include average time taken to complete tasks, number of steps taken, and number of deviations from ideal path. Cawthon and Moere (2007) suggest that customers will be loyal and can be retained when products and services are efficient in meeting user needs.

Effectiveness

Effectiveness in this research is measured by ease of learning (number of correctly accomplished tasks), easy access to sources available (Number of errors encountered in accomplishing each task), and expenses after purchase of product (money spent after purchase). According to Peter and Bevan (2009), effectiveness is the completeness and accuracy with which users achieve specified goals. Effectiveness is a standard declared by the ISO 9241 standard on Ergonomics of Human System Interaction (Part 11 1998) on usability. Frokjaer et al. (2000) identify indicators of effectiveness as quality of solution, and error rates. Frokjaer et al. (2000) further state that effectiveness measures the outcomes of customers' interaction with products. The metrics chosen for effectiveness in this research are shown in table 3.9.

Bevan et al. (1991) identify Smith and Mosier (1986) specifications of design interface as the best, as they formed the ISO (1990) guidelines). From these specifications, product design requires conformance to standards based on ergonomic requirements of the features, and customers' expectations. However according to Bevan et al. (1991), conformance and features alone cannot assure usability of a product, requiring accessibility and assortment to be included.

	Initial Usability Goal	Initial Measures	Initial Gauge (Units)	Initial product development and service design Outcomes
2.		Ease of learning	Number of correctly accomplished tasks	Design effectiveness
	Effectiveness	Easy access to sources available	Number of errors encountered in accomplishing each task	Accessibility

Table 3.9: User-Test Effectiveness Measures

According to Deloitte (2014), organisations use regulatory and other enforced processes as an excuse to provide poor customer-experiences without considering other experience-based principles that can be used to manage and improve the customer-experience.

Kobie (2017) and NGDATA (2015) suggest that unlike product centricity, customer-experience should be tailored to individual customers, fast, intuitive, integrated, accessible, and relevant. Seffah et al. (2009) add that accessibility is necessary for effectiveness and define it as the ability of the product to be used by all types of persons. Therefore, having different methods of attaining the same goal enhances accessibility (Caldwell et al. 2004).

Engagement

Engagement in this research is measured by: customers' expectations on needs (customers' thought); customer adaptability to product (customers thought on reuse), and; comparison to competition (customers thought). Engagement usually occurs when a product is pleasant and satisfying to use. Heather (2011) explains that engagement is an avenue to demonstrate innovation in numerous ways such as challenge feedback, and perceived control. Engagement is also essential for interaction and can easily be noticed by users. According to Quesenbery (2004) is influenced by users' impression of a product, and enjoyment derived from using it.

According to (Chapman 1997; Jacques et al. 1995) engagement is influenced by perception of users, presentation, innovation, and influences retention of customers through the influence on their experience. The metrics chosen for engagement in this research are shown in table 3.10.

Sonderegger et al. (2012) states that the design and aesthetics of a product influences perceived usability and customers' experience, and engagement. According to Kobie (2017), a positive customer-engagement also translates into greater customer loyalty.

According to Deloitte (2014), too many organisations focus on trying to deliver 'world class' service – rather than giving customers what they actually want, which in most cases is a quick and easy process to follow, that is right first time. According to Heather and Toms (2008), engagement is a desirable and essential factor from products and services by customers. Heather and Toms (2008) further state that engagement makes products intuitive to use and will influence users' willingness to use the products again. According to Blythe et al. (2003), it is no longer enough to ensure products are merely usable, they should be aimed to ensure customer satisfaction which in turn leads to retention. Eshghi et al. (2007) justify the use of "thought" as the metric for engagement, stating that customers feeling motivates attachment to products and services, and can be used to measure frequency of use of products.

Table 3.10: User-Test Engagement Measures

	Initial Usability Goal	Initial Measures	Initial Gauge (Units)	Initial product development and service design Outcomes
3.		Customer expectations on needs	Thought	Meets expectations
	Engagement	Customer adaptability to product	Thought on reuse	Product Engagement
		Comparison to competition	Thought	Innovation and uniqueness

Research has shown that a 1 percent increase in customer satisfaction leads to a 2.37 percent increase in return on investment (ROI), while a 1 percent decrease in satisfaction leads to a 5.08 percent decrease in ROI (Gupta and Zeithaml 2006). Shahizan and Li (2001) add that uniqueness is required in in content alongside scope, accuracy, authority, currency, and linkages to other user-experience factors. According to Egol et al. (2004), launching new products and services is one way of generating organic growth, but this growth is short-lived because competitors almost immediately mimic innovations. Verganti (2009) introduced the theory of design driven innovation, stating that user-centred design is a source of radical innovation.

According to Kobie (2017), a customer-centric approach can add value to a company by differentiating themselves from competitors who do not offer the same experience to ensure engagement. According to Kim and Ross (2013) the product should not be at a risk of developing errors, requiring it to be durable.

Error Tolerance

Error tolerance in this research is measured by efficiency of use for the first time (number of tasks completed without support); access to help or user guide to recover from errors (time, attempts); umber of errors encountered in accomplishing each task (Number of errors), and; response from guide in solving problem (time). An error tolerant program is designed to prevent errors caused by the user's interaction, and to help the user in recovering from any errors that do occur (Quesenbery 2016). Documentation and help while using products and services is essential for effectiveness. Design effectiveness occurs when the product is successful and can produce intended results (Cambridge 2017), and therefore requires some level of error tolerance, especially for human error.

Table 3.11: User-Test Error Tolerance Measures

	Initial Usability Goal	Initial Measures	Initial Gauge (Units)	Initial product development and service design Outcomes
4.		Efficiency of use for the first time	Number of tasks completed without support	Design effectiveness
	Error tolerance	Access to help or user guide to recover from errors	Attempts	Support
		Number of errors encountered in accomplishing each task	Number of Errors	Quality of product
		Response from guide in solving problem	Availability	Communication

Therefore, the support and communication are also important. How well the product or service works constitutes reliability Frokjaer et al. (2000) and is an indicator of error tolerance alongside quality which represents a high standard. For documentation and reuse of knowledge, communication between the customer and the 'support' provided, and response from the organization is essential (Bevan et al. 2008).

According to Fader (2011), organisations need to be customer responsive to have best total solution for customer intimacy. According to Kobie (2017), customer-centricity is not an initiative that can be limited to the call centre or service desk. To build long-term loyalty and gain increased share of wallet with customers, organisations must integrate customer-centricity into every channel and touch point and ingrained into every area of the business.

3.2.2 First Version of the Conceptual Framework

This research first considered strategy in terms of the prescriptive strategies, which is one of the perspectives discussed in the literature review in section 2.1. This research argues for objectivity and structure in strategy development and measurement, it is only logical to recommend the prescriptive perspective of strategy formulation considering it is based on the belief that structure and planning is needed. Furthermore, Sarbah and Otu-Nyarko (2014) recommend the perspective view of strategy formulation, for the reason that it emphasizes the importance of how strategies should be formulated.

Sarbah and Otu-Nyarko (2014) agree with Rumelt (1979) who suggest that strategies should be planned and formulated based on consistency with goals and policies of the organisation, consonance with the external environment, advantage gained, and feasibility in terms of resources available, which could be poorly achieved with emergent strategies.

Rajasekar and Khoud (2014) finds that most failures from strategy occur due to poor implementation, and therefore more attention should be placed on this aspect. Rajasekar and Khoud (2014) acknowledges the importance of formulating an innovative and unique strategy; however, it is very important to ensure the strategy works through proper planning thereby requiring the prescriptive approach. It was therefore assumed that emergent strategies could arise as sub strategies in this sense (Osarenkhoe 2016), but it is necessary to take time to plan for implementation.

Researchers have found that 50% to 80% of strategies fail due to poor implementation (Ashkenas and Francis 2000; Atkinson 2006; Beer and Nohria 2000; Carlopio and Harvey 2012; Jonk and Ungerath 2006; Raps 2004). Kaplan and Norton (2006) also find that 70 to 90 percent of organizations fail to realize the success of implementing their strategies. Mankins and Steele (2005) find that only 63% of financial objectives envisioned by companies' strategies are achieved. Johnson (2004) finds that 66% of corporate strategies are never implemented. Bell, Dean, and Gottschalk (2010) find that organisations find strategy implementation to be complicated and time consuming, and are affected by organizational culture, uncertainty, leadership style, human resources, information availability and accuracy, organizational structure, and technology. Kaplan and Norton (2005) find that 95% of staff does not realize their organization's strategy. Baroto et al (2014) find that strategy outcomes could go four ways. When strategy development is appropriate and strategy implementation is excellent, it yields success. When strategy development is appropriate, but implementation is poor, it yields trouble.

When strategy development is inappropriate, but implementation is excellent, it leads to rescue or ruin. Lastly, when strategy development is inappropriate, and implementation is poor as well, it leads to failure. Hosseinain-Far and Chang (2013) agree with Turban et al. (2006), that information systems should be used for strategic alignment of business in terms of cost reductions, new products, competitive intelligence, competitive weapons, relationships with suppliers and customers, innovative applications, links with business partners, and changes in processes. Based on the metrics identified in the previous section, the first version of the conceptual framework to be developed in this research for ensuring strategic alignment and measurement is illustrated in figure 3.34.



Ring 2: Usability Goals

Ring 3: What is being measured

Figure 3.34 Conceptual Relationship Framework

The conceptual framework shows the relationship between the usability metrics and business strategies for customer-centricity. This first version of the framework is used as the template for the analysis of data collected in chapter five. The framework shows two rings relevant to the measurement of strategies.

The first ring shows that customer-experience is the ultimate goal of the process of improving product and service design. Therefore, the purpose of the conceptual framework is to measure customer-experience, which translates to the appropriateness and outcomes of product development and service design strategies. The second ring represents the usability goals: efficiency, engagement, error tolerance, and effectiveness. The framework is to be used to measure the outcomes of strategies, and the metrics to be used are required to be adapted from usability. These goals in the ring are the fundamental usability goals, from which the measurement targets are to be identified. The third ring represents what is being measured in terms of efficiency, engagement, error tolerance, and effectiveness of the products and services, which also have business origins. The terms relate to the usability concept, as well as business performance concepts. At this stage, these outcomes are a guide, on which user data will be used in improving.

3.3 Research Philosophy

The axiological assumption of the research was that individual beliefs of customers serve as the guiding reason for their actions and was therefore a basis for making judgements in this research as suggested by Heron (1996). Epistemology refers to the nature of contributions to knowledge that can be made because of research, looking at the legitimacy of data forms such as facts from interpretations, narratives, and stories (Gabriel et al. 2013; Marti and Fernandez 2013). This research considers visual, numerical, and textual data as legitimate data in achieving the objectives. These forms of data are further discussed in the data collection section 3.6. Objectivism in this research assumes that social reality was external to businesses and should be studied independently and free from the values and beliefs of the researcher. The subjectivism asserts that the reality of customer-centricity depends on the perception and actions of individuals. Having acknowledged these, the types of philosophies identified by Saunders et al. (2012) which include positivism, critical realism, interpretivism, post modernism, and pragmatism are discussed to justify the philosophy on which this research was based.

The first was postmodernism, which was similar to interpretivism but was more critical in the sense that it allows the assumption that reality was because of perceptions and acts of individuals, and not independent of their actions (Saunders et al. 2016).

This would mean that the dynamism of the business environment was indeed an important factor influencing performance and actions of organisation, and drivers within the business environment (of which customers are major drivers). However, postmodernism was open to objective and subjective based data because it looks at interpretation relatively and based on the recipients, justifying the need for qualitative and quantitative data in this research. The axiological assumption with post modernism in this research made the researcher open about to various values, beliefs, and perceptions of customers. Therefore, it was referred to by Saunders et al. (2016) as radically reflexive and was defined as a philosophy that questions the accepted ways of thinking and give voice to alternate wold views that have been silenced and marginalised by dominant perspectives.

Critical realism and interpretivism which advocate the use of only subjective methods in data collection (Orestein 2005; Saunders et al. 2016) however do not apply since subjective data would not completely, accurately and without bias, evaluate the targets considered in the measurement of strategies. Therefore, post modernism was relevant in this case, as it recognises the roles played by organisations in their reality and allows the use of methods suitable to show the true position of the organisation based on measures which may in some cases be marginalised. This relates to the use of customer-centricity as the basis of strategy making in organisations. Postmodernism was also the underlying philosophy for assessing the impact of strategic fit on successful innovation and effective knowledge management. This was still based on the belief that perceptions and actions of the organisation lead to their realities.

The adoption of this philosophy was also based on the need to look for relationship between data collected and make generalisations. It was able based on the need to apply proven rules and laws to interpret these relationships. Therefore, it was best to assess the relationship between variables objectively, which was suitable and relevant to the nature of the objective. Pragmatism, the second philosophy, relates to the use of practical methods in dealing with problems, rather than theory or abstract principles to suit the conditions that exist of the research problems. Therefore, it somewhat explains that the results of a research justify the methods used in answering the research question or solving the research problem. Pragmatism strives to reconcile objectivism and subjectivism by considering theories, concepts, ideas, hypotheses and research findings in terms of the roles they play as instruments of thought and action and in terms of their practical consequences in specific contexts but not in an abstract form (Cornish and Gillespie 2009; Kelemen and Rumens 2008).

With this philosophy, the research problem and question are the determinants of the strategy adopted. It was possible to work with different types of knowledge and methods when a research problem does not suggest unambiguously that one knowledge or method should be adopted, as there are many ways of interpreting the world, that one single point of view can ever give the entire picture (Saunders et al. 2016).

However, this must be based on the use of methods that enable reliable, well founded, credible, and relevant data to be collected. Pragmatism was also the underlying philosophy for this research in developing and applying usability methods in assessing the appropriateness and outcomes of a strategy in enhancing products and services for improved user-experience; proposing recommendations and a framework for improving product and service design strategy, and; developing an approach for correcting usability problems found in product and services.

3.4 Methodological Choice

The research choice for this research was the complex mixed method involving both quantitative and qualitative data in a sequential manner, as described by (Saunders et al. 2016). Quantitative method required the use of predetermined and structured data collection techniques for instruments distributed to managers and users (Saunders et al. 2016). It was applied to test the relationship between variables as in the case of the statistical tests listed in section 3.5 and analysed using a range of statistical and graphical techniques. The qualitative method on the other hand involves the research of participants' meanings and the relationships between them to develop a conceptual framework and theoretical contribution. The qualitative method was also associated with pragmatism (Denzin and Lincoln 2011) and was therefore suitable for this research.

Qualitative studies tend to uncover trends in thoughts and opinions and drive deeper into the broad research question (Saunders et al. 2009). It included the use of observation and interviews and was applied in conducting the user tests in this research. The quantitative studies on the other hand were primarily descriptive, using surveys, and observation, and was also applied in conducting the user tests as well as collecting data from the organisations.

The mixed method relates to the postmodern philosophy and pragmatism by allowing the collection of quantitative data, but also qualitative data to explore perceptions (Nastasi et al. 2010; Tashakkori and Teddlie 2010). It also related to the abductive research approach. Bryman (2006) finds the use of this method advantageous in the sense that it helps in overcoming the weaknesses associated with using a mono method for data collection, while providing a richer scope to data collection, analysis, and interpretation compared to the multi quantitative or qualitative choice.

The sequential exploratory design involves the use of qualitative methods followed by quantitative methods, while the sequential explanatory method involves the use of quantitative method followed by qualitative method, and the multiphase design involves the use of both methods in more than one phase. For instance, in this research: quantitative data from the questionnaire followed by quantitative data from the first phase of the user tests, then qualitative data from the second phase of the user tests.

Quantitative methods are employed in assessing business strategies for product development and service design processes from the strategic plan of the case studies, and current strategy measurement processes for service design and product development employed in the case studies. Quantitative methods are also applied in assessing the strategic fit of manufacturing and service companies in the UK, comparing the application of their internal resources in meeting external needs, assessing the success level of innovation, and assessing the effectiveness of knowledge management.

Quantitative methods are also applied in using usability principles in developing usability testing measures for protocol analysis/ think aloud design, assessing each task based on metrics developed for each usability measure, and comparing and rating the assessment of product and service to organisation strategy. Qualitative methods are applied through the user interviews, usability methods in the PACT analysis, development of metrics for each measure, testing product usability, and observation of users for gestures, actions, and facial expressions, and users will voice their thoughts as they complete the tasks, comparing organisation's strategy to results, and providing recommendations for improvement of product and service design strategy. This was further explained with details given in the sections 4.2 for the survey data, and 5.2 for the user test data.

3.5 Research Approach to Theory Development

The research approach for this research was therefore abduction. Abduction relates to the exploration of a phenomenon, identification of themes, location of the themes in a conceptual framework, and testing the framework through subsequent data collection, by generalising from the interactions between the specific and the general (Suddaby 2006). This requires moving back and forth with data and theory by combining induction and deduction.

Deduction involved the evaluation of propositions related to an existing theory, by making generalisations from the general to the specific (Blaikie 2010). This means collecting data to prove a theory, and it was applicable was assessing the relationship between customer-centricity and business performance through the use of questionnaires to business managers. Induction on the other hand involved the exploration of a customer experience as a phenomenon, identification of themes, and creation of a conceptual framework, by making generalisations from the specific products and services from 10 diverse sectors to the general customer-centric businesses in the UK. This basically meant making a theory from data collected (Bryman and Bell 2015) and was relevant in developing the conceptual framework for the research.

It has been noted that the use of usability testing improves operational testing in organisations. To determine how best usability goals can be applied on a strategic level and answer the broad research question, it was necessary to understand the business conditions, and the role usability testing can play to improve these conditions. This first involves the collection of data from the organisations to conduct the following tests:

Factor Analysis:

- 1. A significant relationship exists within the performance and outcomes of strategies, the use of technology and information systems, and the development and implementation process of strategies.
- 2. A significant relationship exists within error tolerance, ease of use, effectiveness, and efficiency targets.

Data was then collected from customers to test the following hypotheses.

MANOVA Analysis:

3. Significant differences exist between user-experience and factors such as age, gender, technological expertise, and frequency of use of the products and services.

Template Analysis:

- 4. Customer-experience can be measured by usability targets
- 5. Customer-centric strategies can be measured by usability targets

Both set of data are evaluated and the findings are justified through the testing of the following hypotheses.

Regressions Analysis:

- 6. A significant relationship exists within the customer-experience strategies
- 7. A significant relationship exists between high customer-experience with products and services of manufacturing and service companies and the strategies identified in the research
- 8. A significant relationship exists between customer-centricity and financial performance

The results from these analyses aid in developing a version of the conceptual framework, which was data-driven based on the user tests.

This user testing process involves the collection of data from customers to determine how the products and service design can be improved based on measures developed in this chapter. These findings are then compared with the findings from the propositions tested, which aid in developing other versions of the conceptual framework in chapters 4 and 5. This framework was then validated by collecting data to assess the relevance of the framework in the industry in chapter 7.

3.6Data Collection

This research involves the use of primary and secondary data. Primary data was collected through observation, questionnaires, and interviews. All primary data collection requires the informed consent of the participants. Primary data give the researcher absolute control of collating information and focus attention to details on the research questions (Cooper and Schindler 2008). Secondary data was collected to support findings and conclusions made in the research.

3.6.1 Questionnaires

The survey strategy allowed the collection of quantitative data. The survey strategy which was a fixed and non-experimental strategy was used with the individual level analysis in assessing the success level of innovation and the effectiveness of knowledge management and assessing hypotheses of business performance based on successful innovation and knowledge management, and assessing the strategic fit of manufacturing and service, comparing the application of their internal resources in meeting external needs.

Survey questions were adopted from previous studies and some were developed originally. Primary data was collected in this research using questionnaires to identify environmental factors considered in strategy development, identify current strategy measurement processes for service design and product development employed in manufacturing and service companies, identify theoretical tools currently used in the case studies for strategy development, assess the success level of innovation with yes/no questions (Tohidi and Jabbiri 2012, Vicente, Abrantes, and Teixera 2015, Yiu and Pun 2014), and assess the effectiveness of knowledge management with yes/no closed-ended questions (Ghani, Elias and Mohd (2013), Sofianti, Suryadi, Govindaraju, and Prihartono (2012). Samples of the questionnaires can be found in appendices 1 - 4. The process for selecting strategy tools included in the survey is described in the literature review, section 2.4.4.

The questionnaires included closed ended questions which were ranked on a scale of 1-3 (low, medium, high), and open ended questions. Rather than collect primary data from the organisations as a whole, data were collected from individuals working in sales, design, and engineering management of their respective organisations. The questionnaires were distributed to managers on tactical levels of the manufacturing and service organisation. This was because the research relates majorly relates to the implementation of strategies which relates to the roles of managers on the tactical level. This level manages the appropriateness and outcomes of the strategies when implemented. The respondents were selected based on their positions at their respective organisations, to ensure they have relevant experience and are in the position of knowledge to give relevant responses to the questionnaires.

The use of individual level analysis removes the element of respondents' bias when distributed to organisations, in the sense that there was a chance that the organisations could respond to the questionnaires to show a positive representation of their company. However, when individuals respond as 'experts' based on experience and other criteria, they are not representing the organisations, but rather filling the questionnaires in the position of experts with working experience in the relevant fields, and therefore have lesser tendency of falsifying their responses. Furthermore, individuals are more responsive than organisations. The organisations tend to 'push' the responsibility of filling the questionnaires around, and it was left undone. The research aims to develop methods applicable to both manufacturing and service organisations in the UK are represented. The criteria for selecting managers included the sectors in which they worked, management experience, level of management, scale of business operations, distance of manager, and availability of manager.

Questionnaires were used in collecting primary data from business managers. They were quantitative when closed ended questions were asked, and qualitative when open ended questions were asked. The use of questionnaires involved collection of data from a large sample of at least 400 managers contacted, requiring respondents to respond to the same set of questions. Results from the questionnaire are analysed by the computer, using SPSS. The research questions and objectives influence the choice of research questions. The wording of the questionnaires was necessary to ensure the right data was collected. Closed ended questions required responses based on ranking and were coded for quantitative analysis. The questionnaires were distributed in person, and an online platform (BOS) to reach more respondents. Primary data are collected in this research using open and closed ended questionnaires and think aloud protocol for the user tests. The use of questionnaires allowed collation of primary data in a flexible manner, facilitating the personification of new information and understanding of intercultural communication potential (Sachdeva 2009).

Acceptable Sample size and Response Rate

The acceptable response rate on surveys by researchers in the area of strategy differs in relation to differences in duration of the research, nature of research, sample size, and validity of the instrument used. Zhuang (1995) stated that 35% of the sample size was an acceptable rate. This however was because the survey served as method of data collection and validation, unlike Fiorentino et al. (2014) who validated using interviews after the questionnaires were returned and found 7.1% to be an acceptable rate for both validation and actual response. The pilot research and second survey by Zhuang (1995) was aimed at bridging the gap between technology and business strategy.

According to Zang (1995) however, a pilot research of the questionnaires was necessary for validation, to provide insight into ongoing innovation activities in companies. This was somewhat similar to the purpose of the follow-up interviews used by Fiorentio et al. (2014). Fiorentino et al. (2014) first conducted a survey, sending 466 questionnaires to professors, with a response rate of 12.67%. However, when the data was cleaned, the response rate was 7.1%. According to Fiorentino et al. (2014), this response rate was consistent with similar research by Gates and Very (2003) on measurement models to support the decision making in organisations. The questionnaires were then validated and extended using interviews with experts and executives to deeper insight to ongoing activities in organisations regarding decision making. Other researchers like (Bruner 2002, Mukherjee et al. 2004) also applied this method, by distributing questionnaires, then having follow up interviews for validation.

Pishdad and Taghiyareh (2011) also did not validate their survey through a pilot research. Their questionnaires were distributed to 350 organisations, of which 63% responded. Their research on the mass customization strategy development was done in Delphi, covering different types of firms and industries, selected through stratified sampling. Pishdad and Taghiyareh (2011) consider their response rate of 63% adequate, as the data were gathered over the course of 11 months. Hsu (2016) who however followed methods adopted by other authors (Chen and Su 2011, Qureshi and Compeau 2009, Real et al. 2006), distributed formal questionnaires to 1000 companies, and had a response rate of 28.3% within 18 months. Pishdad and Taghiyareh (2011) received 220 completed questionnaires in 11 months, and Hsu (2016) had 283 questionnaires in 18 months, proving that given more time, the number of completed questionnaires can be higher. In the same light, Hsu (2016) also developed a pre-test questionnaire and validated it by conducting a focus group interview to determine the participants and scope, and relationship among the proposed research dimensions.

The research on a value co-creation strategy model for improving product development performance involved 7 experts for this phase to ascertain that the measurement variables extracted from the literature were suitable for the research. The questionnaires were distributed to 200 managers from the Taiwan Electrical and Electronic Manufacturers' Association. The response rate for this was 21%. Chi (2015) also developed survey instruments which were pre-tested through eight interviews with senior executives of apparel SMEs for the research to assess University students' intentions to use behavioural alcohol-reduction strategies. With a 10.5% response rate on questionnaires distributed to 3000 small and medium sized apparel manufacturing firms. For this research, the survey targeted senior managers with an overview of the firm's business operations and strategies to ensure they had knowledge of the issues the survey addressed.

Based on a total of 266,000 manufacturing companies in the UK, and a total of 4,075,000 service companies in the UK, making a total of 4,341,000 manufacturing and service companies in the UK, the Taro Yamane (Yamane 1967:886) formula was applied to validate for generalisability. The simplified formula to calculate sample size based on normal/Gaussian distribution showed the appropriate sample was 400 respondents. At least 600 individuals were contacted for the research:

$$n = \frac{N}{1 + N * (e)^2}$$

Where: n = the sample size

N = the population size of 4,341,000

e = the acceptable sampling error (5%), assuming the 95% confidence level

Following the studies by Fiorenti et al. (2014) and Gate and Very (2003), which are similar studies on measurement, the acceptable response rate was 12.6%, of 400, which was 50 responses.

3.6.2 Secondary Data

Secondary data for the research was collected from online platforms for the PACT analysis to determine the types of users to recruit for user tests. PACT analysis by Benyon, Turner, and Turner (2005) was a framework for thinking about a design situation in relation to an interactive system. Performing a PACT analysis was useful for both analysis and design activities; understanding the current situations, seeing where possible improvements can be made and envisioning future situations.

PACT analysis brings together research on target users and scope out the variety of different people, activities, contexts and technologies possible. From the analysis, it was possible to develop clear and concrete scenarios of how target users would interact with products and services. Secondary data was collected from usability studies to prepare develop usability testing measures for protocol analysis/ think aloud design (Adebisen, Villiers, Semigabi 2009), to develop metrics for each measure, develop post task questions, develop measures for comparing organisation's strategy to results, and to prepare tasks for users.

The archival and documentary strategy as the name implies involves the use of archives and documents (Lee 2012). This included textual documents from company reports and strategy documents, and was obtained from company websites. They are considered as secondary data because they were originally created for other purposes (Hakim 2000). This strategy was used in the financial analysis of profit performance of customer-centric companies in the UK. Financial data from financial reports were to be collected for use in the analysis. This was not done however, because it was found to be unnecessary.

The criteria for selecting organisations financial reports were sector, company brand, and quality of products, location, innovation, and availability of data.

1. Unique features

The organisation should have a feature such as environment, size or structure not duplicated by another case research

2. Brand

A known brand within the area to ensure the researcher can find users that can relate to the use of the products and services

3. Quality of products and services based on market research

The organisation should have an average product and service acceptability that has a minimum was the sector norm. This was rated from customer reviews of at least 2.5 of 5.

4. Location

A branch of organisation should be within 100 miles of my workstation, within travelling distance in case there was need to source more secondary data.

5. Innovation

The organisation should have products or services that can be classified as either radical or incremental innovation

6. Access to data

The data should be readily available on the internet

3.6.3 Observation

Observation could be traditional, or participant observation; structured, or unstructured; internet mediated, and; videography observation. Participant observation allows the researcher to closely observe the subject in their social setting, to understand the situation from the root. The level of participant observation differs by the extent of the researcher's participation in the observation, and the revelation or concealing of the researcher's identity. Observation can be influenced by observer bias, error, drift, and effects. However, these can be mitigated by using strategies to explore and validate interpretations. Structured observations involve quantitative analysis, requiring coding and possibly pilot testing. It was necessary to ensure the coding used was free from ambiguity. There was also internet mediated observation which required the collection of data from online communities, with the researcher participating as well. Observation using videography was another form of observation, requiring the recording of images to electronic media to collect observational data. This was usually helpful in the sense that it provides a platform for reference when analysing. However, there are ethical concerns with the handling of video recorded data.

The user tests require the structured observations of users in phase one of the collection process, while giving their opinion on the products and services being used. This combines the use of observations and interviews, as follow up questions were asked. The observations were video recorded. Protocol analysis/ think aloud design involves evaluating products and services by testing with users (Henderson and Varela Alvarez 1995). During a test, the participants' complete typical tasks while observers watch, listen and takes notes. Users were asked to complete tasks, typically while they were being observed by a researcher, to see where they encounter problems and experience confusion (Landeur 1993). Primary data was collected through user tests of product usability, and observation of users for gestures, actions, and facial expressions, and users will voice their thoughts as they complete the tasks. The tests are carried out on Coventry University premises and locations convenient for the participants to use the products and the services. 5 users are chosen to fit the findings from the PACT analysis for each of the case research. The process was described in the data gathering section (5.2) of chapter 5. Nielsen (2012) suggests the use of 5 participants in most user-testing cases to give maximum benefit-cost ratio. According to Cazanas and Parra (2017), Nielsen and Landauer (1993) reported that five participants were enough to discover 75% of the problems when testing an interface, while Virzi (1992) stated that four to five participants are enough to determine 80% of problems in the interface under evaluation.

Lewis (2001) also observed that five or four participants uncover more than 80% of problems, provided that the value of p was between 0.3 and 0.4. According to Charters (2003:237) "Using more than one participant enables researchers to observe a wider range of responses, but, as Stake asserts, the choice of the cases need not necessarily be deliberate. "They may be similar or dissimilar, redundancy and variety each having voice. They are chosen because it is believed that understanding them will lead to better understanding... about a still larger collection of cases". Qualitative research is most effective when the researcher "develops categories from informants rather than specifying them in advance of the research" (Creswell 1998:77). This is because the naturalist understands that every research subject is unique, and thus "the concept of 'population' is itself suspect" (Lincoln and Guba 1985:298). Qualitative researchers believe that anyone they work with will have something worthwhile to reveal and that individual responses, however they could be categorized, are ultimately unique.

This research looks to assess user-experience with products and services in manufacturing companies for the pilot research of the user tests. These companies were broken into 10 sectors for relevance and generalizability. 5 participants were included per sector. Each sector has 2 companies for comparison. 5 participants were included for to first assess experience of one company's products, and experience of their competitors' products.

In this sense, 10 participants were included in assessing experience of products from each sector. The research was on the evaluation of experience to conclude on the sectors, not on the evaluation of the products to conclude on the products.

Before the participants carried out the task, they were asked their preference against the metrics set in assessing the tasks. They conducted the tasks while being observed and making comments. After the test session, they were given a survey to rate their overall experience. The videos were watched, transcribed, and analysed. They were transformed to quantitative data based on the metrics set for assessing the tasks. These results were analysed and translated to show meaning to the strategy outcomes.

The research involved 10 sectors, 2 companies each, and 1 product for each company, making a total of 20 products. 5 participants were used for each product, making a total of 100 participants and test sessions. 5 tasks were set for each product, making the total number of tasks assessed 500.

Acceptable sample size

The test method used in the first phase was the Think-Aloud Protocol which was first introduced by (Lewis 1982). The method requires users to voice their opinions while they make use of the products and services. This was different from conducting a survey and asking users what products and services they want. Rather it identifies what users want while they use the product and service (Nielsen 2010, Risius et al. 2017). According to Risius et al. (2017), Think Aloud Protocols (TAPS) are exploratory research method to examine how consumers react to a stimulus, e.g. A product, website or leaflet. The method's unique feature was that participants are asked to 'think aloud', i.e. To concurrently verbalize aloud their thoughts, feelings and associations during tests (Ericsson and Simon 1993, Willis 2005), and are well suited to examine how consumers evaluate different products. Two examples of the use of TAP are Risius et al. (2017) who studied consumer preferences for sustainable aquaculture products; taking evidence from in-depth interviews, think aloud protocols and choice experiments. 6 participants were chosen from different cities for the think aloud experiment. Secondly, Todhunter (2015) used concurrent think-aloud and protocol analysis to explore student nurses' social learning information communication technology knowledge and skill development. The participants were 19 undergraduate students in first, second, and third year of studies.

According to Todhunter (2015), the rule of thumb for sample size appears to be the purpose and characteristics of the activity, and the setting in which it occurs. A small number of participants can give a rich source of evidence related to cognitive and decision processes (Shumway et al. 2003). For instance, Aitken and Mardegan's (2000) work cites just 8 participants, while Edwards et al.'s (2005) sample size was 15 subjects.

Todhunter's (2015) tests were conducted between November 2010 and February 2011 with the 19 students. At intermittent points, the participants were asked "What are you thinking?" to encourage the TAP. Similarly, Risius et al. (2017) followed suggestion by Boren and Ramey (2000) the participants were encouraged to keep on speaking or given the response 'hmmm' when the participants paused. TAPs are applied in different ways. Risius et al. (2017) initially asked participants to imagine they wanted to purchase a given product that could normally be bought in a supermarket, of which were not manipulated. The participants were asked to decide which product they preferred and should concurrently think aloud during the decision-making process.

Subsequently, in-depth interviews about the product followed in terms of what was being measured. According to Karizak (2016), Think Aloud Protocol was based on the assumption that when subjects under investigation verbalize their thoughts while doing certain tasks, this does not interfere with their sequence of thoughts and hence can be considered as a valid data on thinking (Ericsson and Simon 1984). According to Nielsen (2000), 80% of design problems can be discovered by 5 participants in a TAP user-testing research. Caulton (2001) however suggests that a definition of a problem might be relative, meaning that the problem might exist for just some users, making it difficult to agree on what constitutes a problem to conclude based on the decision of 5 users. Six and Macefield (2016) therefore argue that the complexity of the research should determine the number of participants. In that case, fewer participants will be required for less complex studies, and therefore requiring fewer complex tasks. Six and Macefield (2016) made this argument to counter that of Nielsen (2000), because Nielsen made that conclusion based on simple studies. Virzi (1992) then argue that 3 to 20 participants are appropriate for studies.

Researchers go further to suggest various numbers of participants, Faulkner (2003) argues for ten, whereas Turner et al. (2006) argues for 7 participants even for complex studies. Six and Macefield (2016) further argue that the number of participants was relative to the nature of the project, suggesting fewer participants should be included when testing novel designs, but more participants when testing highly critical projects. This research has been justified as novel in the literature section 2.3. The idea to implement usability principles in measuring strategy has not been written or tested in literature, making novelty high. The project however was not critical. This was stated keeping in mind that "critical" was relative. Considering steps are taken to ensure quality, time, and scope of the project was kept in check, it was safe to say that the critical nature of the research was low.

3.6.4 Interview

Interviews could be structured, unstructured, or semi structured; telephone, or in person; videotaped, or audio taped, and individual, group, or focus group. During an interview, the interviewees are asked questions pertinent to the research.

The responses from these questions form the research findings. Structured interviews involve having a pre-determined set of questions. Unstructured interviews are the opposite of structured interviews, having no predetermined set of questions. Semi structured interviews allow the collection of rich and detailed data with predetermined questions but allowing follow up questions during the research.

They can be used in exploring topics and explaining findings in a research. Due to logistics and geographical constraints, it might sometimes be necessary to conduct interviews over the phone. This in no way affects the quality of the interviews. However, it may be more difficult to create a personal connection with the interviewees. It was possible to tape the interviews to be transcribed for analysis. Structured interview questions were asked during the second phase of the user tests and the testing of the final framework. During the process, users are also expected to voice their thoughts as they use the service. The goal was to identify any usability problems, collect qualitative and quantitative data and determine the participant's satisfaction with the product (Nielsen 2003). Usability testing was a way to see how easy to use something was by testing it with real users (Nielsen 2000). Products and services of two companies in each of the ten sectors will be used for the user tests, due to time constraints and resources available. The research involved 24 participants, using products and service from 4 organisations. These organisations were from the best resulting company, and the worst resulting company from the first phase of the research.

3.7 Data Analysis

For this research, quantitative and qualitative methods of data analysis are employed in analysing qualitative and quantitative data respectively (Saunders et al. 2009). Some methods are usability methods, some are tailored to the research, and others are regular research methods of analysis.

Statistical Analysis

Descriptive Analysis was a quantitative method and was used in presenting and analysing the questionnaire results (Saunders et al. 2009, Todd 2007). The questionnaire data were assessed based on a 70% threshold of the frequency of responses. Inferential analysis was then applied in the interpretation of the questionnaire and phase 2 of the user testing data. This involved Factor Analysis for the questionnaires and user tests, and one-way ANOVA for the user testing data. These methods are described and applied in the data analysis section of chapter 4 (Section 4.3 and 4.4).

Content Analysis

Content Analysis "is a research technique for the objective, systematic and quantitative description of the manifest content of communication" (Berelson 1952: 18). It involves coding qualitative data to analyse them quantitatively.

It was useful in structured observations, and aid in analysing large amounts of qualitative data. Content Analysis was used in assessing the usability results in testing product usability, and observing users for gestures, actions, and facial expressions, and users will voice their thoughts as they complete the tasks (Nielsen 2012). The tasks are analysed based on metrics developed for each usability measure. This was applied in the analysis of data generated in phase one of the user tests.

Template Discourse Analysis

Template Analysis according to Saunders et al. (2016) was a type of thematic analysis which according to Braun and Clarke (2006) was a foundational method for qualitative analysis and can be found in other methods of qualitative analysis. However, in Template Analysis, only a portion of data are coded, before an initial and hierarchical list of codes and themes are developed, which then serve as the coding template (King 2012). According to Saunders et al. (2016), this might require coding first interview or observation to develop the template. They are then arranged and rearranged until satisfactory. Subsequent data are then coded using the initial template. It was also flexible like the thematic analysis, and systematic. PACT analysis was a qualitative method of analysis, and was a usability method as well, used in analysing the people, activities, context, and technology employed in used a product or service (Benyon, Turner, and Turner 2005). Template Analysis was the approach adopted for the PACT analysis. The method was also applied alongside discourse analysis in interpreting the interview data. The discourse analysis according to Saunders et al. (2016) was relevant when assessing data related to organisational communication, culture, decision making, practices, and processes. It was also relevant to ethnography strategy where there are transcripts relating to the use of language in discourse.

The following process suggested by King et al. (2015) was followed.

- 1. Reading through the interviews transcribed for analysis, to be familiar with the content.
- 2. Preliminary coding of the data based on the initial template of efficiency, engagement, effectiveness, error tolerance
- Organising the emerging themes in form of experience targets and requirements into clusters, and defining how they relate to each other within these groupings, and between the customer-centric strategies
- 4. Defining the initial coding template on the basis of majority experiences
- 5. Applying the initial user-experience template to further data and modify as necessary.
- 6. Finalising the user-experience template and applying it to the full data set.

3.8 Summary

To summarise, the methods adopted in answering the research questions were highlighted in this chapter. Data was collected from primary and secondary sources using questionnaires, and observations and interviews from the user tests. Data was analysed using qualitative methods of analysis such as template discourse analysis, and Content Analysis. Quantitative methods of analysis including inferential and Descriptive Analysis were employed in analysing the quantitative data. The research philosophy was Post modernism and pragmatism. The research approach to theory development was abductive. The research also adopts sequential mixed research methods, a combination of quantitative and qualitative in multiple phases. The research design was sequential mixed. The research focus was combined, with the use of descriptive, explanatory, evaluative, and exploratory focus. Using the methods identified in this chapter, the next chapter discusses the data gathering process, and presents the questionnaire results, to aid in achieving research questions 1 and 2.

Chapter 4: Data Gathering, Analysis, and Evaluation- Strategy Related Survey Data

4.1 Introduction

For reason of clarity, this chapter deals with data collected from managers. The next chapter contains the usability results from tests conducted with customers. This chapter describes the process of survey data collection, analysis, and evaluation, to answer the research questions:

- 1. How effective are existing strategy measurement processes and tools in improving service design and product development?
- 2. How does strategic fit influence the success of an innovation and effectiveness of knowledge management, which serve as the basis for business performance?

The third research question is dealt with in chapter 5. Chapter 4 covers the presentation and analysis of the questionnaire results, and the development of the second version of the conceptual model to show the extent to which usability can serve as a basis for customer-centric strategy measurement. The data gathering section explains the process of questionnaire distribution. The results from the 4 questionnaires are descriptively analysed in the results section. Factor Analysis is employed in the following section to analyse the questionnaire data. A financial data analysis is carried out to determine the effect of customer-centricity on profit. Finally, the framework is updated based on the results from the Factor Analysis.

4.2 Data Gathering

The questionnaires were used to achieve the following objectives:

- Evaluation of theoretical tools and processes currently used in manufacturing and service organisations for strategy measurement, and;
- Assessment of strategic fit of manufacturing and service organisations, evaluating the application of their internal resources in meeting external innovation and knowledge management needs.

4.2.1 Questionnaire Section 1: Level of Innovation and Strategic Fit

Some of the questions included in the survey were adapted from Margarida et al. (2014), based on INNOVSCALE which they developed, as a scale to measure innovative capability in terms of product development, innovativeness, strategic capability, and technological capability, to test the impact on financial, strategic, and achievement measures in organisations.

They found that innovation capability is a higher-order construct formed by four dimensions: product development capability, innovativeness, strategic capability, and technological capability.

Some questions were also adapted from Tohidi and Jabbari (2012), who provided a framework for measuring innovation in companies. They suggest that the measurement of innovation should not be based on techniques that simply introduce some factors which are effective in innovation process such as measuring inputs and outputs but based on information from the whole process in researching the company's innovative activities. They measure innovation based on activities within 3 years, to identify the quantity of products, design and new or optimized processes the quantity of newly opened markets and new marketing methods, Utilizing up-to-date technology, and Research & Development budget. The questionnaire helped in answering research question 2 to show the impact of strategic fit on innovation as discussed in the literature review section 2.7.4. The survey can be found in appendix 3.

4.2.2 Questionnaire Section 2: Level of Knowledge Management and Strategic Fit

The questions in this questionnaire were adapted from Sofianti et al. (2012), who provide a method of measuring the performance of knowledge creation, emphasizing the need for customer cocreation. A measurement framework was developed to be used to measure and to improve the productivity of the of customer knowledge co-creation in the relationship between selling firms and buying firms in projects. Their method was combined with the comprehensive instrument developed by Ghani et al. (2013) for measuring knowledge management systems in organisations.

They measurement items were based on the content of knowledge created, mapping of knowledge stored, manipulation of knowledge used, sharing in the knowledge community, usefulness of knowledge learned, and security of knowledge reused. This was also used with Yin et al. (2014) method of measuring knowledge management performance in organisations, showing the process between management, processes, and results. The questionnaire helped in answering research question 2, to show the impact of strategic fit on knowledge management as discussed in the literature review section 2.7.3. The survey can be found in appendix 4.

4.2.3 Questionnaire Section 3: Strategy Measurement metrics

This questionnaire was developed to determine how the appropriateness of strategies relating to product development and service design are measured in organisations. The metrics were derived from the literature review section 2.2: resources required; time span required; competitive advantage; change demand; ability to meet success factors; objectives; right fit for the environment; simplicity, and; organisational culture.

There were also questions based on the balanced scorecard metrics, to determine how they influence the measurement of strategies in organisations. The questionnaire- which helped in answering research question 1- can be found in appendix 1.

4.2.4 Questionnaire Section 4: Strategy Development Tools

This questionnaire required the respondents to indicate which of the different strategy development tools were used in their organisation and assess the relevance of these tools in developing and measuring strategies for product development or service design on a scale of 1- low to 5- high. If the tool had not been used, they were required to indicate. The tools used were selected in the literature review section 2.4.4, and their relevance and shortcomings with regards to strategy measurement were evaluated in section 2.5. The questionnaire helped with research question 1, to determine the shortcomings of existing tools. The questionnaire can be found in appendix 2.

4.2.5 Process of Collection and Analysis

The questionnaires were first tested for relevance and understanding by respondents by distributing to 5 middle level managers. The questionnaires were then modified to ensure that information was provided to ensure the respondents understood the criteria for the rank-scales to be selected when assessing the questions. To ensure the reliability of the questionnaires, the survey was pre-tested with 5 respondents and the instrument was thus slightly refined with regards to arrangement, wording accuracy, and relevance. This procedure helped to make the final survey instrument more valid and clearer. Validity of the instruments was also ensured by following the criteria for selection of respondents, as discussed in section 3.6.1.

For the main survey data collection, over 300 managers were contacted via email in December 2016. There was a very low response of 12, so more questionnaire links were sent, and the questionnaires were now distributed through more personal contacts and methods by March 2017 to the individuals working in sales, engineering, and design departments in the 10 sectors, with 37 responses by June 2017. After two months, another set of over 300 questionnaires were distributed in June 2017 with 54 more responses by July 2017, making a total of 103 responses from the over 600 questionnaires distributed. The questionnaires were mostly delivered and chased in person to the business managers all over the UK (London, Coventry, Birmingham, Leicester, Glasgow, Manchester, and Dublin) manufacturing and service companies. A sample of the informed consent form can be found in appendix 22, and the participant information sheet can be found in appendix 23.

Follow-up emails were sent fortnightly to remind the respondents to complete the questionnaires. The questionnaires are distributed within 9 months to over 600 individuals working in sales, design, and production departments in their organisations from 10 sectors in the UK.

The respondents were chosen based on their position in their organisations as described in the methodology chapter, section 3.6.1.

Of the 400 respondents required based on the Taro Yamane formula in section 3.6, a response rate around 12% is acceptable, as in the case of Fiorenti et al. (2014), with their research on strategy and technology. A total of 103 responses was recorded. When the 103 (25%) responses were confirmed sufficient, there was still a low response rate compared to the efforts made. Table 4.12 shows the distribution across demographics.

Table 4.12: Survey Frequency Distribution across Demogra			cs
Sector	n		
Manufacturing	54		
Service	49		
	103		(

|--|

Department	n
Sales	12
Design and Engineering	27
Customer Relationship	17
IT	15
Marketing	18
Operations	14
	103

Years of Experience	n
1-5	12
6-10	58
10-15	13
More Than 15	14
	103

Level of Strategy	n
Strategy development	32
Strategy implementation	71
	103

The questionnaires were evaluated using Descriptive Analysis based on frequency of response, and Factor Analysis. The Factor Analysis measured the variability of correlated variables in terms of unobserved variables or factors (Fabrigar et al. 1999). All the questionnaire responses were inputted in the SPSS software for analysis. The Factor Analysis resulted in four factors. These factors were deduced to show performance and outcomes of strategies, technology and information systems, and strategy development and implementation. Variables with the highest percentage were included in respective groups. The responses from the different stages of collection were also compared to ensure validity and reliability of data collected. The results are presented and analysed in the following sections.

4.3 Results

The results from the questionnaires completed by 103 individuals working in sales, design, and engineering departments of various manufacturing and service organisations in the selected sectors are presented in this section. The tables show the percentage of the responses.

4.3.1 Sector

Of the over 600 individuals contacted, 103 responded, giving a response rate of 26% of the required 400 responses.
Table 4.13: Sectors

Sector	Response rate (%)
Academic	3
Bank	14.6
Car Manufacturing	6.8
Cosmetics Manufacturing	10.7
Electronics Manufacturing	7.8
Food Manufacturing	20
Health Sector	7.8
Mechanical	6.8
Retail	6.8
Telecommunications	15.5
Total	100.0

As shown in Table 4.13, the questionnaires were distributed to individuals working in the following manufacturing and service sectors in the UK: Academic; Bank; Car Manufacturing; Cosmetics; Manufacturing; Electronics Manufacturing; Food Manufacturing; Health Sector; Mechanical; Retail, and; Telecommunications. 48% of the responses were from the service sector, and 52% were from the manufacturing sector. It was much easier to obtain responses from the service sector. However, the conclusions made from the questionnaire analysis can be generalised to the manufacturing and service sectors, considering that the method was formed for the purpose of generalisation in section 3.6 of the methodology. The next few sections present the analysis of the questionnaire data.

4.3.2 Innovation and Strategic Fit

The aim of the questions in this section was to assess the level of innovation in the manufacturing and service sectors in the UK, to aid in achieving research objective one. According to (Tohidi and Jabbiri 2012; Vicente et al. 2015; Yiu and Pun 2014) organisations are innovative when there are new processes, new products, improved processes, improved technology, and improved products introduced regularly, at least within 3 years. Using 70% benchmark to show respondents that agree with the statements in the questionnaire, 5 questions attracted a response of more than 70%, and are in the blue section of the Table 4.14 below.

I	able	4.14:	Innovation	Responses	

Questions	Responses
Innovative strategies increase our customer acquisition	82.5
Innovative strategies increase our customer retention	82.5
The success of Research and Development activities in your organisation is based on long-term	
know-how	82.5
External threats affecting successful innovation are effectively identified in your organisation	82.5
Formulating innovative strategies increases our annual profit	72.8
Over the past three years, at least one product has been improved by your organisation	65

Over the past three years at least one new process used for products has been optimised or	
improved by your organisation	65
Our technological capabilities are top class	65
External threats affecting successful innovation are effectively managed by matching available	
internal resources in your organisation	65
Over the past three years at least one new process has been used for product development or	
service design in your organisation	57
Your organisation considers future market needs when developing strategies for product or	
process innovation (such as changes in customers wants, competition, substitute products,	
new entrants)	55.3
Over the past three years your organisation used new technology for its products or services	47.6
Your organisation invests at least 10% of annual returns on research and development	37.9
Formulating innovation strategies increases our employee skills	27.3
Over the past three years at least one new product has been proposed to the market by your	
organisation	17.5

Results show strategic fit is poorly managed by the organisations sampled. This means that the sample of manufacturing and service companies in the UK do not properly align their internal resources to enable innovation. The results do however show that they only go as far as identifying the external threats that affect successful innovation of their products and services. The results also show that the organisations perform poorly given the measures of innovation above. However, the level of innovation achieved by the organisations allows them to enjoy some benefits of innovation such as customer acquisition and retention, successful R&D activities, and increased profit. It was also found that the major outcomes organisations expect from being innovative include improved technology, increased profit, and customer acquisition.

4.3.3 Knowledge Management and Strategic Fit

The second questionnaire was adapted from Ghani et al. (2013) and Sofianti et al. (2012) to show the effectiveness of knowledge management in manufacturing and service organisations in the UK. The questions are grouped based on the knowledge management cycle of knowledge creation, use, storage, sharing, learning, and reuse. Using 70% benchmark to show respondents that agree with the statements in the questionnaire, 10 questions attracted a response of more than 70% in Table 4.15 below.

	Question	Response
Knowledge Storage	We try to store expertise on new tasks design and development in the organisation	82.5
Knowledge Learning	Knowledge made available for use throughout your organisation are updated regularly and maintained well	82.5
Knowledge Reuse	It is easy to extensively search through customer and task related knowledge documents from databases for reuse in the organisation	82.5
Performance	Effective knowledge management increases our employees' skills on handling tasks	82.5

Table 4.15: Knowledge Management Responses

Performance	Effective knowledge management increases our annual profit	82.5
Performance	Effective knowledge management increases customer acquisition in the organisation	82.5
Performance	Effective knowledge management increases customer retention in the organisation	82.5
Knowledge Storage	We document customer and task-related databases to obtain knowledge necessary for the tasks in the organisation	72.8
Knowledge Creation	Various knowledge sources (such as databases) are administered by your organisation to allow employees search for information relating to product design	65
Knowledge Use	Knowledge is shared throughout your organisation to all relevant employees for use	65
Knowledge Sharing	We developed information systems, like intranet and electronic bulletin boards, to share information and knowledge and improve task efficiency in the organisation	65
Knowledge Creation	Your organisation ensures that previous employees adequately introduce new employees to design processes	55.3
Knowledge Learning	Our employees are given educational opportunities to improve adaptability to new tasks	55.3

The organisations performed poorly in terms of the knowledge management measures including knowledge creation, use, sharing, and learning. However, the results show that in some areas of knowledge management such as storage, learning and reuse, the organisations performed well. It was also found that the major outcomes organisations enjoy from knowledge management include improved employee skills, increased profit, and customer retention.

4.3.4 Relevance of Strategy Measurement Processes

This questionnaire aimed to assess the metrics used by organisations in measuring strategy appropriateness and outcomes. This will aid in determining how best to guide the application of the model resulting from this research. As a general initial observation, 3 questions attracted a response of more than 70%. The results of the relevance and shortcomings of existing strategy measurement metrics discussed in section 2.3 of the literature review, in improving service design and product development in manufacturing and service companies in the UK.

rable high strategy measurement methods	
Metrics	Responses
Competitive advantage	82.5
Ability to meet Success Factors	82.5
Objectives	82.5
Right fit for the Environment	65.1
Resources required for product development and service design	55.3
Time span Required for product development and service design	55.3
Business Culture	53.4
Simplicity of products and services	45.6
Change demand of systems	37.9
How relevant are existing strategy measurement processes in improving service design	
and product development in your organisation	36.9

Table 4.16: Strategy Measurement Metrics

As a general initial observation, therefore, only questions attracted a response of more than 70%. Based on the results in the Table 4.16, the organisations measure their strategies based on how it aids in achieving objectives, achieving competitive advantage, and success factors, and pay less regards to the other factors necessary for developing customer-centric strategies. Significantly, it was found that only 27.2% of organisations consider that existing strategy measurement processes are very relevant in improving service design and product development in organisations, as 9.7% find it relevant, 18.4% somewhat irrelevant, 27.2% not relevant, 18.4% depending on how it is used. Therefore, most manufacturing and service organisations in the UK strategy measurement processes are not appropriate in improving customer experience.

It was found that the major reason behind the use of inappropriate tools is that no particular method or tool is used in 36.4% of the organisations, no direct process is used in 18.22%, existing processes lack the ability to aid in identifying design problems for improvement of strategy in 18.2%, lack of precision in 9.1%, and no defined tool for measuring in 9.1% of the organisations. The intention of this work is to develop a tool that will be relevant in measuring strategies, and the primary data contains the novelty of this work.

Metrics	Responses
Financial	82.5
Customer	82.5
Learning and Growth	82.5
Revenue	82.5
Growth	82.5
Customer Retention	82.5
Customer Acquisition	82.5
Internal Consistency	72.8
Customer-experience	65
Friendliness of Use of products and services	55.4
Information Systems Capability	55.4
Knowledge Management	55.4
Employee Productivity	55.4
Attractiveness of products and services	55.3
Validated products and services	37.9

Table 4.17: Strategy Measurement Metrics 2

Using the 70% benchmark, Table 4.17 above shows the metrics considered by organisations when developing or improving products. The major factors for good product and service design scored the least. This reiterates the need for a framework that includes these factors when measuring customer-centric strategies aimed at improving product development and service design.

4.3.5 Relevance of Strategy Development Tools in Strategy Measurement

The respondents were asked to rate the tools used by the company to develop strategy on a scale of 1 to 5, and 0 for the tools not used. Follow up questions were asked to determine why those tools were not used. The questionnaire was developed based on tools chosen in the literature review. It aims at determining the relevance of selected tools in developing strategies and in measuring them. 81.8% of the respondents agree that the appropriateness of a strategy is relevant for its success. The results in table 4.18 show that from the list of tools assessed, cost benefit analysis, and balanced scorecard are the tools most relevant in measuring strategies.

Table 4.18: Tools

	Strat	egy	Reason for not using tool					
Tool	Development	Measurement	No Experience	Inappropriate	Time Consuming)	Unaware	Resources
PEST								
Scenario Planning								
Porters 5								
Customer Journey Map								
TOWS matrix								
Value chain								
VRIO								
Personas								
Cost Benefit Analysis								
Porters Generic								
Bowman's Clock								
Ansoff								
Strategy Diamond								
Balanced scorecard								
Strategy mapping								
						Relevant		
						Mostly relevant		
						N	ot relevant	

4.3.6 Reliability

Using Cronbach's alpha on SPSS, the reliability of the questionnaires was assessed. The result in table 4.19, of 93.5%, 97%, and 97% in Table 4.24 for the questionnaires on innovation, knowledge management, and strategic management processes, show that the questionnaire results are highly reliable.

Table 4.19: Reliability Tests

Cronbach's Alpha	N of Items
.935	15
Knowledge Management Rel	iability Statistics
Cronbach's Alpha	N of Items
.970	14
Processes Reliability S	Statistics
Cronbach's Alpha	N of Items
.970	38

Innovation Reliability Statistics

4.4 Factor Analysis

Results from the questionnaires were analysed using Factor Analysis to show commonalities within the data, and enable the linking of customer-centric strategies to usability targets. The table 4.20 below shows four factors in the results. The section with the highest result was selected for each question. The first factor shows results related to performance and outcomes of strategies. The second factor shows results related to technology and information systems. The third and fourth factors show results related to the nature of strategies to developed and implemented.

Table 4.20: Factor Analysis Results (Rotation: Varimax with Kaiser Normalization)

Rotated Component Matrix^a

		Compo	onent	
	1	2	3	4
Over the past three years at least one new process has been used for product development or service design in the organisation			.337	
Over the past three years at least one new product has been proposed to the market by the organisation	.931			
Over the past three years, at least one product has been improved by the organisation			.911	
Over the past three years at least one new process used for products has been optimised or improved by the organisation			.911	
Over the past three years the organisation used new technology for its products or services		.653		
The organisation invests at least 10% of annual returns on research and development		.810		
The organisation considers future market needs when developing strategies for product or process innovation (such as changes in customers wants, competition, substitute products, new entrants)		.879		
Formulating innovation strategies increases our employee skills	.591			
Formulating innovative strategies increases our annual profit	.931			
Innovative strategies increase our customer acquisition	.931			
Innovative strategies increase our customer retention	.931			
Our technological capabilities are top class		.777		
The success of Research and Development activities in the organisation is based on long-term know-how	.931			
External threats affecting successful innovation are effectively identified in the organisation	.931			
External threats affecting successful innovation are effectively managed by matching available internal resources in the organisation		.777		

The organisation ensures that previous employees adequately introduce new		.879		
employees to design processes				
Various knowledge sources (such as databases) are administered by the			.911	
organisation to allow employees search for information relating to product design				
Knowledge is shared throughout the organisation to all relevant employees for		.777		
use				
We try to store expertise on new tasks design and development in the	.931			
organisation				
We document customer and task-related databases to obtain knowledge				.723
necessary for the tasks in the organisation				
We developed information systems, like intranet and electronic bulletin			.911	
boards, to share information and knowledge and improve task efficiency in the				
organisation				
Our employees are given educational opportunities to improve adaptability to new tasks			.797	
Knowledge made available for use throughout the organisation are updated regularly and maintained well	.931			
It is easy to extensively search through customer and task related knowledge	.931			
documents from databases for reuse in the organisation				
Effective knowledge management increases our employees' skills on handling tasks	.931			
Effective knowledge management increases our annual profit	.931			
Resources required			.872	
Time span required		.715		
Competitive advantage	.805			
Change demand		.708		
Ability to meet success factors	.887			
Objectives	.931			
Right fit for the environment	.655			
Simplicity			.664	
Culture	.604			
Financial	.931			
Customer	.700			
Internal Consistency	.732			
Learning and Growth	.798			
Revenue	.931			
Growth	.931			
Retention	.931			
Customer Acquisition	.700			
Customer-experience			.793	
Attractiveness		.879		
Friendliness of use		.992		
Validation		.932		
Information Systems Capability		.994		
Knowledge Management		.916		
Employee Productivity		.992		
Appropriateness of a strategy is relevant for its success	.931			

The strategy measurement metrics assessed in the questionnaire were in two parts. The first part referred to the factors taken into consideration when developing strategies, and therefore form the basis of a checklist when assessing the success or failure of strategy implementation.

The second part included factors which were found in the literature review to be crucial to the success of achieving good customer-experience. Both parts have metrics in three factors of the analysis. Competitive advantage, ability to meet success factors, objectives, right fit for the environment, and business culture, are included in the first factor. The nature of these metrics form basis for outcomes of a strategy when implemented. Of this basis, the results show that the organisations sampled do not consider metrics to measure if the strategy was appropriate for the environment after implementation, and they do not measure the resulting impact on business culture.

The first factor also includes metrics from the second part of the assessment. Financial measures, Customer measures, Internal Consistency measures, Learning and Growth measures, Revenue measures, Growth measures, Customer Retention measures, and Customer Acquisition measures are indicators of performance and the strategy outcomes. The results show that the companies sampled consider all these metrics in their measurement processes. The second factor included relates to information systems. The variables included in the second factor from the first part are the time span required to execute a strategy, and change demand for the implementation of the strategy. Both metrics are not adequately measured by the sampled organisation.

The variables included in the second factor from the second part are Employee Productivity, product/service attractiveness, Information Systems Capability, Friendliness of use of product/service, Knowledge Management, and Validation. Similar to the first part, these variables are also not adequately measured by the sampled organisations. The third factor relates to the actual strategies developed and implemented. The first part includes the simplicity of the product or service, referring to aesthetics strategies, and; the resources required for the product or service, referring to the pricing, marketing and sales and distribution strategies. The results show that these factors are not sufficiently considered in product development and service design. The second part includes only customer-experience, and can be said to mean that the strategy should aim to achieve customer-experience. The types of strategies with this goal are customer-centric strategies.

The factors in the innovation variable are also performance, information system, and strategy. The performance factors include the ability to introduce new products within 3 years, increase in employee skills, increase in annual profit, customer acquisition, customer retention, successful R and D, and effective identification of threats. The results show that the sampled organisations achieve these factors except the improvement in employees' skills.

The technology variables include the introduction of new technology for product and service development within 3 years, investment in R and D, consideration of market needs in the development of innovation strategies, use of top class technology, and management of external threats with internal resources.

The strategy variables relate to product and service development strategies, and innovation strategies. This includes development of strategies to enable the development of new processes, improvement of products, and optimisation of processes.

For knowledge management, the performance factors include employees' skills in handling tasks, annual profit increase, customer acquisition, customer retention, and identification of external threats. The outcome factors include storage of expertise on task design, learning enabled through the availability and maintenance of knowledge throughout the organisation, and reuse enabled by extensive search of knowledge databases. The sampled organisations performed well in all these factors. The information system factors include knowledge creation from previous employees, and knowledge shared for use in the organisation. The sampled organisations did not meet the benchmark for these factors. The strategy development factors include knowledge management strategies to create knowledge from internal and external sources; IT strategies to share knowledge in the organisation, and; operational strategies to enable learning to improve employees' adaptability to change and new tasks. The sampled organisations did not meet the benchmark for these factors. It includes Customer Relationship Management (CRM) strategies based on customer knowledge stored for use in the organisation. The sampled organisations performed well in this respect. In the next section, the strategies identified are discussed and included in the model.

4.5 Evaluation: Research Question 1- Effectiveness of Existing Strategy Measurement Tools and Processes

This section shows how the survey data answers research question 1: 'How effective are existing strategy measurement processes and tools in improving service design and product development'. In the literature review, it was identified that there is need to develop a framework to address the gaps in existing strategy measurement processes. This section looks at the relevance and shortcomings of existing strategy measurement processes and tools in product development and service design in manufacturing and service companies, and how usability can be applied in solving the problem identified.

Product and service design, if aimed at improving interaction between organisations and customers as suggested by Shekar (2007), should be customer-centric, and should therefore aim to achieve the goal of providing positive user-experience. To provide improved user-experience therefore, product and service design should aim to achieve product usability targets to meet customers' needs, thereby enabling organisations to retain and acquire new customers. The results of the survey validate findings by Fader (2011), as there is proof that many organisations that claim to be customer-centric are not.

This is because, as found in the survey, they fail to adopt processes relevant and specific to the measurement of customer-centric strategies. This also confirms a major gap found in the literature review, that there is no effective method for measuring the relevance and outcomes of strategies. This is because if businesses had an appropriate method for this purpose, they would be aware of relevant processes and targets for improving user experience, and implementing them to improve customer experience.

From the 15 tools assessed in the questionnaires distributed to managers, the balanced scorecard and the cost benefit analysis are the strategic management tools found to be relevant in measuring the appropriateness and outcomes of customer-centric strategies. The other tools are not used by managers either because of their lack of experience or knowledge in using the tools to measure strategies, or time required in using the tools, or mostly because they were inappropriate for measuring appropriateness and outcomes of strategies. The balanced scorecard is originally a strategy implementation tool. The cost benefit analysis which is an internal tool, has been found to be relevant, with limit, in the measurement of strategies.

Balanced scorecard comprising of financial, customer, learning, and internal process perspectives is used in qualitatively and quantitatively assessing the quality of the strategies. Following the balanced scorecard principles, studies could show that some companies already consider few usability factors in the development of strategies, especially in the areas of internal consistency, and learning and growth. Balanced scorecard was found to be an effective tool for generic strategy measurement, but does not provide a detailed basis for customer-centric strategies. With focus on bringing balance to the 4 perspectives, the balanced scorecard takes into consideration the external and internal business environment, which could be why Tyne (2010) suggested user-experience be assessed based on the metrics of the scorecard.

The cost benefit analysis is also widely acknowledged and is employed by quantitatively analysing costs related to the implementation of a strategy, against the quantitative benefits. The strategy frameworks are also relevant in achieving competitive advantage, meeting success factors, and meeting business objectives. Several shortcomings were however found with these tools when considering user-experience strategies. In the measurement of customer-centric strategies, the cost-benefit analysis and the balanced scorecard have more shortcomings than benefits. In assessing the appropriateness and outcomes of customer-centric strategies, they are unable to determine if customer-centric strategies are the right fit for the environment. They also fare poorly in assessing the resources required for implementation of customer-centric strategies in terms of employees and technology. The methods fail in adequately considering the time span required for execution and realisation of customer-centric outcomes.

They fail in assessing the embodiment of organisational culture for positive experience, and ensuring the product and service design are simple. Most of all, the methods do not consider change demand required for strategy implementation. Though the balanced scorecard and cost benefit analysis are effective to an extent in measuring the success of a generic strategy, they do not measure customer-experience. Customer-experience is the major goal of customer-centricity and target for service design and product development. Based on these results therefore, it was found that customer-centric organisations do not appropriately measure their customers' experience. They base success of product development and service design on the generic outcomes used in non-customer-centric activities. This is not surprising considering yet again that Fader (2011) suggested that many organisations that claim to be customer-centric are not.

This could be due to a number of reasons, such as: inability to link customer-experience strategies to corporate vison and mission; inability to commit key resources to customer-centric product development and service design on a full-time basis; underestimating the criticality of change management for customer-centricity; lack of appropriate executive alignment; taking a 'piecemeal' approach to customer-experience management, and most especially; lacking discipline in measuring results of their customer-centric strategies, some of which were also suggested by Reise (2014). Furthermore, it was found in the research that the balanced scorecard and cost benefit analysis do not assess the friendliness of use of the products and services, the information systems capability of the organisation, the effectiveness of knowledge management, employee productivity, attractiveness of the product or service, and validation of the product or service. All of which are crucial for product development and service delivery. This presents room and opportunity for the implementation of usability processes and tools in improving the product and service development. Implementation of this system however would require some organisations to change their service delivery.

delivery behaviour and lean towards better and improved customer-centric strategies, focusing, in addition to existing processes used that consider other factors, on improved product attractiveness, friendliness of use, validation, information systems capability, knowledge management, and employee productivity.

This is where the framework presents its benefits, as it aids organisations to focus on improving these areas. Tyne (2015) also considers this important, stating how user-experience through usability testing ensures 100% profit returns, making it a good concept on which strategies can be developed. However, in agreement with researchers, the application of usability is more than just meeting customers' needs. Also, compared to market research, which authors (Nielsen 1994, Schade 2016, Walji and Piotrowski 2008) also argue is only a part of the picture of what usability testing is about, usability testing is more than just understanding the voice of the customer, but understanding how they think. This cannot fully be achieved with the ordinary research methods.

Through customer participation and co-creation, usability targets are relevant in reducing costs related to product and service development and support, gaining more understanding of customers' behaviour, improving company's knowledge management and innovation, decision making on product development and service design, making more effective products, identifying strengths and weaknesses of products, and achieve goals towards product improvement. Using the targets developed in this research, the customer-centric strategies can be developed or improved. As illustrated in figure 6.51, this would also require improved processes which would help develop better quality products and services.

The goal of improving customer-experience would be achieved in the short run, leading to improved business outcomes in the long term. These outcomes would be reflected in the business performance. As a flexible concept, and applicable in various ways as seen in various studies (Bevan, Carter, and Haker 2013; Babbar et al. 2002; Hasdogan 1996; Margolin 1997; Peter and Bevan 2009; Quesenbery 2004), Usability principles can be used to provide qualitative and or quantitative metrics for assessing how appropriate or how well the customer-centric strategy performed considering external and internal business factors. Considering macro environmental factors, a framework based on usability for product or service development could still assess and include drivers such as government regulations and standards, price effects, social acceptability, and even technology turbulence, all depending on the metrics used. Usability testing can also be applied to assess how the organizations strategy meets the requirements of the industry forces (buyers, substitutes, competitors, new entrants, suppliers).

Metrics could also be provided to assess interdependencies within the industry forces. Depending on the goal the organization wishes to meet, the metrics can be used to assess the outcomes of the strategy based on tasks given to users to interact with the product, as they are the ultimate factor required to be satisfied. Assessing user-experience through user testing can aid in the identification of how an organizations resources and capability improved the users' experience.

This would largely be based on the nature of the tasks given to the users during the test, and how these tasks are assessed. Customer participation in prototyping as well can yield effective outcomes in measuring the outcomes of the company's strategy. In section 2.8.3 methods that can be applied for successful customer participation are identified. In this process, resources and capabilities that need to be improved on can be identified, as well as areas in which the company is lacking. On a positive note, the process can also identify resources and capabilities that yield positive outcomes for the company. By employing different methods of user testing, it is possible to measure customers experience considering whatever strategy the organization employed. The tasks will be aimed at evaluating the success of the strategy in relation to what it was intended to do.

Findings from chapter 5 of this research will enable the modification of the framework developed in this study to take these points into consideration. Section 6.4 contains more detailed description of the ways by which businesses can include Usability in their strategic management processes to improve product development and service design.

4.6 Evaluation: Research Question 2- Impact of Strategic Fit on Innovation and Knowledge Management

This section shows how the survey data answers research question 2: 'How does strategic fit influence the success of an innovation and effectiveness of knowledge management, which serve as the basis for business performance?' In the literature review, it was identified that there is need to determine how a balance in entrainment or strategic fit can impact the success or failure of innovations and knowledge management in manufacturing and service companies. This was based on the conclusion that innovation and knowledge management are directly linked to business performance, and can therefore serve as measures of business performance. To address this gap, this section considers the impact of strategic fit, first on successful innovation, and then on effective knowledge management, both as measures of business performance.

The benefits of innovation enjoyed by customer-centric organisations found in the research are similar to some of those enjoyed by non-customer-centric found by other researchers (Margarida et al. 2014; Tohidi and Jabari 2012). They include increased customer acquisition, increased customer retention, long term know-how, and increased profit. For customer-centric manufacturing and service businesses, this good performance has been attributed to the effective identification of external threats in the organisation. The identification of external threats would usually be done in the analysis of the macro and the macro environment while strategy is being developed. However, owing to certain possible reasons, increase in employee skills and new product development on 3-year basis or less is not included in these benefits enjoyed by customer-centric organisations. This can be attributed to the fact that the external threats identified in analysis are not properly managed. This could be due to the development of inappropriate customer-centric strategies in managing these threats, or poor implementation of innovation strategies. However, it is more likely to be that the internal resources are not properly aligned to achieve expected results, resulting in a lack of new processes, lack of improved products, and lack of improved processes.

Furthermore, these organisations fail to upgrade technology regularly, invest enough in research and development, and consider future market needs when developing strategies. Innovation only occurs and is successful when appropriate strategies are developed and implemented. This is achievable by properly managing internal competencies of the organisation, especially technology, employees, and processes.

Proper management could lead to successful outcomes of innovative customer-centric strategies, including product development strategies, operations strategies seen in employees' skills, pricing strategies seen in annual profit, aesthetics strategies seen in customer acquisition, customer relationship strategies seen in customer retention, and knowledge management strategies seen in long term know how.

Some benefits of effective knowledge management to customer-centric businesses also correlate with findings by other researchers (Ghani et al. 2014; Sofianti et al. 2012; Yin et al. 2014). These include: storage of expertise for reuse; organisational learning; accessible databases enabling knowledge reuse; improved employee skill; increased profit; customer acquisition, and; customer retention. However, these benefits could be improved if the processes employed in effective knowledge management are improved. Of the 6 knowledge management components, knowledge storage is what many customer-centric organisations excel at. However, they tend to not make adequate use of the knowledge, and have problems creating knowledge from previous employees. Similar to problems with innovation, this could be because of the development or implementation of inappropriate knowledge management strategies resulting from the flawed process of explicit and tacit knowledge creation from internal and external sources.

The problem can further be said to stem from the development and implementation of inappropriate Information System strategies which affect the ability to share knowledge in the organisation. Essentially creation of knowledge in the customer-centric organisation proves difficult. This is the first step in knowledge management as described by Nonaka and Takeuchi (1995): socialization (tacit to tacit knowledge); externalization (tacit to explicit); combination (explicit to explicit), and; internalization (explicit to tacit). More so, the customer-centric organisations do not foster an environment for learning especially with the provision of educational opportunities, affecting the success of operations strategies. However, they do excel at the storage of customer and task related knowledge, making CRM strategies successful. Basically, the organisations do not make adequate use of their knowledge, IT, and employee resources in order to achieve strategic fit, thereby affecting the appropriateness and outcomes of their strategy, innovation, and performance. According to researchers, these are relevant, as they represent the factors of KM: people; processes, and; technology.

This research proposes user-experience targets in the model that should be embedded in a customer-centric strategy, making it applicable where organisations do not have targets for all the outcomes, and to assess the outcomes of targets set. To achieve the desired outcome, it is important to concentrate on the process through research, iterative design, validation, and usability testing. However, to achieve set targets, it is necessary to properly align internal resources to meet customer needs.

4.7 Conceptual Framework Version 2

The second version of the framework introduces the customer-centric strategies, and matches them to the usability targets and measures.

Customer-centric strategies influence organisations' interaction with their customers, reflected in their products and services they provide. The second version of the framework from this research in figure 4.35 introduces customer-centric strategies that could be appropriate and implemented in achieving the results expected, which are displayed on the first column of the framework. These then are measured by the factors shown in the fourth second of the framework, and to achieve expected usability goals in the third column. These outcomes are measured by the customers experience with the product and services. The organisation can rate their success by their ability to meet all 4 usability goals. It can therefore be noted that the conceptual framework addresses the implementation of customer-centric strategies, aiming at sales, marketing, customer service, product and service design, and operations management. Therefore, at this stage the model is aimed at the tactical level of management for appropriateness of strategy for implementation, and outcome of the strategy when implemented. It has value when strategy is formulated with both the prescriptive and emergent perspective, and when used in the implementation phase. The conceptual framework can be used in assessing the appropriateness of a strategy for implementation when developed, the outcomes from implementation.

Customer-centric Strategy	Product and Service	Usability Goal		
1. Sales and Distribution Strategy	Product and Service Accessibility	Effectiveness		
2. Aesthetics Strategy	Design Effectiveness			
3. IT Strategy	Source Communication	Error Tolerance		
4. Innovation Strategy	Product and Service Quality			
5. Knowledge Management Strategy	Product and Service Support			
6. Innovation Strategy	Product and Service Innovation and Uniqueness			
7. CRM Strategy	Product and Service Engagement	Engagement		
8. Aesthetics Strategy	Customer Expectations			
9. Operations Strategy				
10. Product and Service Development Strategy	Product and Service Interaction	Efficiency		
11. Product and Service Pricing Strategy	Cost Efficiency			

Figure 4.35: Second Version of the Conceptual Model

A telecommunications organisation could measure the effectiveness of their variety of channels for providing a service by measuring customers experience through the number of times the customers try to perform a task using the platforms provided to them.

For instance, considering they employ knowledge management strategies, a possible scenario could be when a customer needs assistance with a network or a top-up problem. The inability of the customer to get assistance on their platform of convenience shows a flaw in service design, due to the ineffectiveness of accessible channels. Therefore, the organisation has failed to integrate necessary knowledge required to improve customers experience in this instance. This could be a lack in support available on the website, over the phone, or in the store in person.

If the customer chooses to get help on the website, but is unable to, that serves as an error, and marks negatively against accessibility of the product and service, and generally showing poor effectiveness of the service and the strategy as well. However, whether expressly stated or not, it is expected that knowledge management be effective in organisations to improve customers' experience. Organisations may fail to achieve this possibly because it was not properly planned for, as could be the case mostly in emergent strategies. In light of this, the poor performance of the organisation would most likely result from their poor implementation of their strategy, not noting the need to provide and equip multiple channels to meet customers' needs.

For this reason, the research advocates for proper planning of strategy whether with the prescriptive approach or the emergent approach, as it gives structure, and has been found to improve the possibility of proper implementation of a strategy. This however does not write off emergent strategies, but suggests that the appropriateness of an emergent strategy be assessed when developed.

Another instance is a retail organisation employing innovation strategies for product differentiation. The differentiation of the product or services can be assessed based on the opinions of users who actually use these services from other competitors and can testify based on experience the uniqueness and innovation in the products and services developed by the retail store. Where a research is conducted, and the customers find these services to be similar, worse, or better than their competitors, the organisations will be able to ascertain the appropriateness of their innovation strategy or the outcome.

4.8 Financial Analysis of the Effect of Customer-centricity on Profitability

The goal of this financial analysis is to determine whether the customer-centric model developed in this research can help improve business financial performance. Customer-centricity improves knowledge management and innovation, which are the performance measures for this research and the key standards for customer-centric business performance. However, to take the research a step further, financial performance is also assessed. It was difficult to determine the best financial representation for customer-centric factors and business performance. Financial management experts were consulted for guidance, and appropriate variables were selected. At first, a regression analysis was conducted to show the relationship between share price and research and development, customer numbers, and number of employees. It was concluded however that this method could not sufficiently prove the relationship between company performance and customer-centric strategies. A different approach was adopted, therefore. The companies selected for the analysis are from the 2017 top 100 organisations in the UK Customer-experience Index by KPMG Nunwood (2017), a complete list of which can be found in nunwood.com. 44 of the 100 companies were chosen based on their relevance to the 10 sectors being used in the research, and availability of financial data. The financial data for the companies in table 4.21 were from the recent statements published by the companies for year 2016 or 2017 as was the most current.

S/N	CEI	Companies	Year	Sector
1.	1	QVC	2016	Retail
2.	3	First Direct/HSBC	2016	Bank
3.	4	John Lewis	2017	Retail
4.	5	Lush	2016	Cosmetics
5.	8	Ocado	2016	Retail/Food
6.	9	M&S	2017	Retail
7.	10	Amazon.co.uk	2016	Online Retail
8.	11	Nationwide	2017	Bank
9.	13	Apple	2017	Electronics
10.	17	GiffGaff	2016	Telecommunications
11.	21	Coventry Building Society	2016	Bank
12.	24	Next	2017	Retail
13.	27	Boots UK	2016	Health
14.	28	AO	2017	Electronics/Retail
15.	30	Iceland	2016	Food
16.	34	Clarks	2017	Retail
17.	38	Wilkinson	2016	Retail
18.	40	Sainsbury's	2017	Retail/Food
19.	42	Debenhams	2016	Retail
20.	48	Wagamama	2017	Food
21.	50	Ted Baker	2017	Retail
22.	52	Tesco Mobile	2016	Telecommunications
23.	53	Ikea	2016	Retail
24.	55	Asda	2016	Retail/Cosmetics/Food
25.	59	Morrisons	2017	Retail/Food
26.	60	Krispy Kremes	2016	Food
27.	61	Littlewoods	2017	Retail
28.	62	Toby Carvery	2016	Food
29.	64	ASOS	2017	Online Retail
30.	66	Tesco Bank	2016	Bank
31.	70	New Look	2017	Retail
32.	71	TSB	2016	Bank

 Table 4.21: Customer-centric Organisations based on CEI (KPMG 2017)

33.	72	House of Fraser	2017	Retail
34.	77	eBay	2016	Online Retail
35.	78	Dunelm	2017	Retail
36.	80	B and M	2016	Retail
37.	82	Matalan	2017	Retail
38.	86	Costa Coffee	2016	Food
39.	87	Yorkshire Bank	2016	Bank
40.	88	Mothercare	2017	Retail
41.	89	NHS	2017	Health
42.	91	Primark	2017	Retail
43.	96	Halifax	2016	Bank
44.	97	Ask Italian	2016	Food

4.8.1 Financial Performance and Customer-centricity

The analysis involves a number of financial ratios. Financial ratios were used because they interpret financial statement results and apply information derived (Wood and Wood 2016). The results found in appendix 18 show positive performance for at least 89% of the organisations considering each of the financial ratios applied in appendix 18. Wood and Wood (2016) identify 5 types of financial ratios: profitability ratios, solvency ratios, efficiency ratios, shareholder ratios, and capital structure ratios. The analysis involves the use of profitability ratios to assess the performance of the organisations to indicate satisfactory performance of organisation. This analysis included the

Gross profit: sales ratio= $\frac{Gross \ profit}{sales}$

The GP:S ratio shows how much profit is derived from the sale of product. All the customer-centric organisations had positive results showing they were all able to create sellable products and services in a cost-effective and profitable manner.

Net profit after tax: revenue=
$$\frac{Net \ profit}{sales}$$

The NPAT:R ratio shows how much money an organisation earns per pound/dollar of revenue. 89% of these organisations had positive results.

Return on capital employed=
$$\frac{Profit \ before \ interest \ and \ tax}{(current \ assets-current \ liabilities)}$$

The ROCE ratio shows the influence of leverage on a company's profitability. 89% of the organisations had positive results.

Net profit after tax: total assets =
$$\frac{Net \ profit \ after \ tax}{non \ current \ assets + working \ capital}$$

The NPAT:TA ratio shows if organisations effectively use their assets to generate profit before they pay their contractual obligations. 86% of the companies had positive results.

Gross profit margin =
$$\frac{Gross \ profit}{cost \ of \ goods \ sold}$$

The GPM ratio measures the efficiency of organisations manufacturing and distribution during their production process. 98% of the organisations had positive results.

Net profit margin= $\frac{Net \ profit}{cost \ of \ goods \ sold}$

The NPM ratio shows how well companies convert their sales to profit. 89% had positive results. These companies tend to have better results before operational and contractual expenses set in. Solvency ratios were not used because being solvent means having sufficient resources to meet your debts when due. When it comes to the solvency of a business, both its own ability to pay its debts when due and the ability of its debtors to pay the amount they owe to the business are of great importance (Wood and Wood 2016). This does not directly affect customer-experience with products and services. Efficiency ratio was used because profitability is affected by the way that the assets of a business are used (Wood and Wood 2016). The efficiency ratio used was the

Asset turnover = $\frac{Revenue}{total assets - current liabilities}$

The AT ratio calculates the number of times an organisation can use its assets to efficiently generate sales. 89% of the organisations had positive results. Shareholder ratio was used because it indicates how well a company is performing in relation to the price of its shares and other related items including dividends and the number of shares in issue (Wood and Wood 2016). The shareholder ratio used is

Price/earnings ratio = $\frac{Market \ price}{earnings \ per \ share}$

The PER shows the price an investor is paying for one pound/dollar of a company's earnings per share profit. 98% of the organisations performed well. Capital structure ratios were not used because they assess the way in which a company finances its activities (Wood and Wood 2016), and this does not directly influence the relationship with customers. These financial ratios chosen are the regular financial ratios used in assessing business performance, and the performance result for each company assessed is shown in appendix 19. The financial analysis of the customer-centric organisations showed positive results in term of net returns, and much higher results in terms of gross returns.

However, when the net return on capital results are compared with industry average results in the UK, only 55% of the customer-centric organisations meet or exceed the manufacturing and service industry average. A 3-year trend analysis however shows major improvements over the years in both net and gross profit results, with gross profit returns exceedingly high.

For some of these organisations, return on capital employed and other profitability assessments tend to be below the industry average of 13% as shown in table 7.35 below for manufacturing companies, and 19% for service providing companies. The low net profit margin shows that there could be issues with the pricing of their products, and with effective cost control. The low ROCE shows that the organisations are not efficiently using debt and equity to generate a return. This leaves the organisations with a reduced of profit to be invested back in the company for the benefit of shareholders and capital investment. The net returns as derived from ONS.co.uk (Office for national statistics) is shown in the table 4.22 below.

	- · · ·		(0.10 0010)
Table 4.22: Return	on Capital	Employed	(ONS 2018)

RETURN ON CAPITAL EMPLOYED				
	Net	gross		
Manufacturing PNFC	12.7	10.9		
Service PNFC	18.8	16.7		

Organisations would be unable to reinvest the capital at a higher rate of return, to enable them produce higher earnings per share growth.

Though the gross results show that the organisations have enough money left over for operations, expansion, debt repayment, distributions to owners and shareholders and other miscellaneous expenses, the low ROCE shows that these organisations are not so successful. On the basis of this evidence, and within the limitations of ratio analysis it appears that good financial performance or profitability is not an automatic outcome of customer-centricity. Though 73% of the organisations meet and exceed industry gross average on ROCE, the results show that which organisations have the performance levels of other non-customer-centric organisations.

The analysis shows that though there is the prospect of good financial health up to the point of making gross profit, most likely owing to customer-centricity, improvement in net returns of an organisation does not solely depend on customer-centricity. Therefore, it can be said that customer-centricity, an obviously good practice in improving business performance of innovation and knowledge management for customer experience does not by itself guarantee business financial performance in terms of profit. This financial analysis is novel, within the limitations of the analysis, as it demonstrates that there is no direct relationship between customer-centricity and net returns of organisations. Profitability of the customer-centric organisations can be seen in their gross profit. 80% of the customer-centric businesses had very good gross profit margins above the industry standards. the surveys from this research show that innovation and knowledge management improve business profit. Customer-centric businesses have successful innovation and effective knowledge management. Following this logic, customer-centric businesses should be profitable. The reason for the average net returns could be due to size of expenses.

That is, a measure of how management controls expenses. This could include their control on dividend policies, control on expenses, under-appreciation, but not necessarily customer-centricity.

4.8.2 Determinants of Profit made by Customer-Centric Businesses

CCS is proposed in this research to be composed of activities within IS, KM, Innovation, Aesthetics, Operations, Product development and service delivery, CRM, Marketing, Sales and Distribution, and Pricing strategies. To show the relationship between these strategies and the performance of the companies in the top CEI ranked organisations, the investments and costs attributed to these strategies were identified and calculated from the financial statements of the companies. The components were decided based on the description of the individual customer-centric strategies in section 5.4.

- IT asset = Software found in tangible assets of the balance sheet + computer hardware found in property plant and equipment in balance sheet. This is because IT strategy involves software and hardware spend on resources used in achieving business objectives.
- Knowledge management asset = IT asset + staff cost found in operating expenses of the income statement. This is because KM involves technology, process and staff.KM is a factor of IT Strategy.
- Operations expenses investment = operations expenses in the income statement + Research and Development investment + IT +staff. This is because operations involve all indirect costs associated with product development.
- Relationship asset turnover = customer relationship assets found in the balance sheet+ goodwill found in intangible assets+ marketing cost + research and development investment +Software + staff.
- 5. Innovation and aesthetics investment= intangible assets comprising of goodwill, brand, software, etc. + computer hardware +RD + staff cost. This is because innovation and aesthetics result from these intangible assets, technology, and efforts of staff. Staff costs include salaries, trainings cost, bonuses and other expenses attributed to labour.
- Pricing was not analysed because of the other variables that can affect price (e.g. competitive advantage price match), it is impossible to include price in this assessment.
 Pricing is a factor of IT, KM, and aesthetics strategies.
- 7. Product Development and Service delivery = Direct cost + research and development investment + staff cost + technology cost + operating expenses. This is because product development in manufacturing companies, and service delivery in manufacturing and service companies involves direct labour, direct materials, direct overhead, research and development, and IT.

8. Return on Sales and distribution = Sales – distribution cost –direct labour –IT.

The table in appendix 19 shows the computation of investments in these strategies by the organisations included in the assessment.

The result is used in the next section to determine the relationship between customer-centric strategies and business performance. Rather that calculate the ratio of CCS to profit or revenue or price: earnings, which would have been difficult to interpret, a regression analysis was conducted. This is because regression analysis shows the relationship between performance and CCS, and the degree to which CCS contributed to the performance of the companies. CCS was compared to profit in this regression analysis.

Price earnings ratio was the first choice, but the figures could not correspond for the analysis. Profit figures were more suitable for comparison. The aim of this analysis is to support on the assertion that the model will help business performance improve. Profit, which represented business performance, was the dependent variable. CCS which was represented by the outcomes of the calculation in the previous section 4.8.1 and presented in appendix 19 was the independent variable. The analysis was also conducted with each of the CCS figures to show how each of them individually could improve business performance.

The results which are summarised in table 4.23 below show that a strong relationship exists, and performance is highly influenced by CCSS, especially when they are combined to implement a CCS.

		Profit				
	R	R2	P Value (%)			
	Correlation	Degree of explanation/prediction				
CCS	91.4	83.5	0			
IT	76.3	58.2	0			
KM	72.2	52.1	0			
Innovation	82.6	68.3	0			
Operations	78.5	61.7	0			
Product development and service	31.7	10	3.6			
delivery						
Relationship and marketing	72.2	52.1	0			
Sales and distribution	77.1	59.4	0			

Table 4.23: Relationship between Profit and Customer-Centric Investments

The result shows that these customer-centric areas of the business contribute to the profit of the customer-centric organisations achieve the high-level customer-experience. Studies by UKCSI shows that compared to other companies, companies with high CEI better handle customer complaints. These companies are easier to reach on phone, and the staff is helpful and competent. These companies have made a reputation for themselves, and achieved customers trust, making it easy to do businesses. With the products and service of these companies, customers face fewer problems compared to other companies. When they do have complaints, their complaints are understood and handled fast. 90-96% of customers are highly likely to be loyal, recommend and trust these companies based on their reputation. Customers will choose better services even though it may cost more, if it has higher satisfaction.

Furthermore, just over a third of customer-experiences take place through "digital" channels such as websites, apps, email, social media, text, or web chat, and just under two thirds through the "traditional" channels such as over the phone, in writing, or in person. The CEI research by KPMG Nunwood (2017) shows that these companies make use of customer journeys helping them reduce cost and improve revenue.

4.9 Summary

Research question 1 was answered in this chapter based on the responses from the surveys analysed, showing the shortcomings of existing strategy measurement tools, and the gaps that can be filled by usability. Research question 2 was also answered, showing the influence of strategic fit on innovation and knowledge management. The questionnaire results were presented and analysed using Factor Analysis. The components deduced were strategy outcome and performance, information systems and technology, and strategy development. The analysis categorised the results from the questionnaires relating to innovation, knowledge management, and strategy metrics, into these components. Organisations employ a number of generic strategy development tools to develop, implement, and measure customer-centric strategies. However, these tools do not address user-experience targets. This is essential because the goal of customer-centricity is to improve customer-experience.

Customer-experience is made up of individual user-experiences at all points of interactions with an organisation. The poor implementation of customer-centric strategies excludes relevant sub strategies, affecting the outcomes of these strategies. These strategies were identified and included in the model for assessing the appropriateness and outcomes of a customer-centric strategy. The findings from the questionnaire led to including the types of strategies found to be relevant to customer-centricity to the framework. A second version of the model was then developed. In the next chapter, the framework is used as a template for data collection in the 2 phases of usability testing.

Chapter 5: Data Gathering, Analysis, and Evaluation- User-Testing Data

5.1 Introduction

This chapter describes work done, describing the process of data collection using the user tests, describing in detail the think-aloud method implemented. This chapter of the research contains the analysis of data as discussed in the methodology chapter, to answer the third research question "How can usability methods be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience."

First, the data gathering process for the 2 usability studies is described. The first study was a preexperiment that was conducted to narrow the scope for data collection, with 100 usability tests conducted. The second study of 28 tests and interviews was based on the products identified in the first usability study. The processes for both studies are described in the data gathering section of this chapter. The data from the first phase (pre-experiment) are analysed using Content Analysis and discussed in the next section, after which the main usability study results are analysed using Template Analysis. These results are evaluated in 5.6. Results from chapter 4 are also evaluated with results from this chapter in section 5.7 to determine the feasibility of incorporating usability in the strategy development process. In section 5.8, the third version of the conceptual framework is developed following the evaluation of user testing data.

5.2 Data Gathering

This research looked to determine the applicability of usability in industry design, in the development, implementation, and measurement of strategies. This helped in answering the third research question, which is to determine how usability testing method can be applied in measuring the appropriateness and outcomes of a strategy. The user testing process involved two phases. The first phase involved observations and user tests to narrow down the product and sector selection for data collection and analysis. This was based on the targets developed in section 3.2.1 of the methodology, developed from the literature review. The second phase involved semi-structured interviews with the users from the reduced sample size. This section discusses the processes involved in collecting the user test data in both phases. The overall objective of the interviews was to develop and apply usability methods in assessing the appropriateness and outcomes of a customer-centric strategy in order to help enhance products and services for improved customer-experience. To answer the main research question 'to what extent can usability serve as a basis for customer-centric strategy measurement', the test goals were to:

- Identify obstacles to positive customer-experience with products and services and interactions with customer-centric manufacturing and service organisations;
- Assess the effectiveness, ease of use, efficiency, and error tolerance of products and services from customer-centric manufacturing and service organisations, and;
- Create a repeatable user-experience measurement protocol

The underlying questions for the user tests, based on the framework which served as the template for analysis were:

- 1. What constitutes positive customer-experience?
- 2. How important is ease of use in improving customer-experience?
- 3. How does effectiveness influence customer-experience?
- 4. How does error tolerance influence customer-experience?
- 5. How important is efficiency in improving customer-experience?

5.2.1 Phase 1: Pre-experiment Usability Study

A trend analysis was conducted to determine which sectors could give more depth for the work and define the nature and scope of the work. Data was collected in this phase through user tests consisting of 100 observations, interviews, and surveys that were quantified for analysis (Content Analysis method). The multiple methods used also aided ensuring validity of the results. The assessment found difference in user-experience factors in sectors, from which the sectors with the least and best results were selected for the main analysis of how usability methods can be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved customer-experience. The use of the companies with the best and worst results provides understanding on why they have the extreme performance results, to be incorporated in the model. The metrics used in assessing the results were set from literature review, and developed in section 3.2.1 of the methodology chapter. The first set of data provided results on user preferences. The first version of the framework was used in this stage. They also aided in demonstrating the link between user-experience and customer-experience. In the trend analysis/pre-experiment/pilot research 100 participants were involved in the user test. These results from the pilot research are compared to the aggregate of the benchmarks set by the respondents on how they expected their experiences to be. The results were quantified and analysed as shown in this chapter, after which the recordings were disposed for ethical reasons.

Pre-Test Information

The participants were given information prior to the test in order to prepare them for the tests. The participants were made to understand the nature of the research and were told they could use any preferred method of interaction (digital and non-digital) for the assessment. All 100 of the participants chose to use online platforms accessed either through their laptops, tablets or phones, or one provided by the researcher. The participants were given the pre-test information and participant information sheet, and they gave their consent to participate in the research. Before the test, the participants were made to know that they were not the subject of the test, the products and services were. Therefore, they could not fail or pass the test, only the products and services could.

They were informed that they were helping identify the design flaws of the products and services. Participants were asked to attempt every task and leave any frustrating task. They were also told it was necessary to point out what made the task frustrating. After 10 minutes, all incomplete tasks were to be abandoned. Also, participants were asked to give positive or negative comments while using the products and services to help with the analysis of the tests. Once it was confirmed that the users understood this, the user tests were conducted based on the tasks listed in the next section.

PACT Analysis

The acronym PACT (People, Activities, Context, Technologies) aims at illuminating in each situation the **people** the design is aimed at, in what **activities**, in what **context**, and using what **technologies** as illustrated in Figure 5.36 below. Therefore, as applied in this research, the relevant characteristics and skills of the users are evaluated, the activities they carry out with the products and services are evaluated, the environment of the activities, and what tools are used are also evaluated. The purpose of this analysis in this research is to determine the sample of users to be included in the user tests, and to develop appropriate and relevant tasks to aid in assessing the experience of users with products and services of the selected organisations.

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Figure 5.36: PACT Analysis (Benyon et al. 2005)

The PACT analysis, which can be found in appendix 5 was used in developing the tasks for the research. It is defined by Benyon et al. (2005) is a framework for thinking about a design situation that provides more understanding on the features of interactive technologies and how to approach designing interactive systems. Using a review strategy, the research follows the principles provided by Benyon et al. (2005), in evaluating the' People' that make use of the products and services, psychological characteristics, physical characteristics, experience, education, language, and usage differences are evaluated.

The 'activities' are identified based on frequency, individual vs co-operative work, complexity, security critical, and nature of content. The 'contexts' are categorised into physical environments, social environments, organisational context, and amount and type of support for activities. The 'technology' is assessed based on input, output, and communications. The analysis is done on the five manufacturing and five service sectors being used in this research. Being a general analysis on their products and services, the PACT analysis is done on the academic sector on students learning experience in higher education, the retail sectors on customers shopping experience, the telecommunications on user-experience with broadband, TV, and mobile phones, healthcare on patient experience, and banks on customer-experience. For the manufacturing sectors, food, cosmetics, mechanical, electronics, and car manufacturing sectors are assessed for user-experience. The sectors were randomly chosen to ensure a variety of products and services shown in table 5.24 were included.

	Sector	Product
1.	Education	Academic and non-academic services
2.	Retail	Groceries
3.	Telecommunications	Tariff Plan
4.	Healthcare	Medical consultation
5.	Bank	Current account
6.	Food Manufacturing	Beverage
7.	Cosmetics	Skin Care Products
8.	Mechanical	Heating and Cooling systems

Table 5.24: Products and Services Tested

9.	Electrical	Television
10.	Automotive	Cars

Sample Size of Pre-Experiment Usability Study

The choice of participants for the pilot research was 5, going with the Nielsen (2000) curve, 6-9 participants will not yield more useful information; therefore, 5 participants are used for each product and service, taking all the arguments (Charters 2003, Nielsen 2000; Six and Macefield 2016) into consideration. In this research, TAP was employed with 2 companies' products and services in each of the 10 sectors, with 5 participants each. The use of 20 products or services with 5 tasks for each company and 5 participants makes a total of 500 tests with 100 users. Results from the trend analysis helped to reduce the product/service selection for user-testing in the second phase. The user-testing process was video recorded for analysis. The choice of test equipment is important in ensuring user behaviours are interpreted correctly during analysis, and to ensure all necessary movements are captured. The test equipment used was a Sony HD camcorder. The device was chosen because of its intelligent-scene mode feature, and optical image stabilization, which was important especially for the user tests conducted on services in outside environments. The participants were recruited via emails and word of mouth. Table 5.25 shows the distribution of participants.

	Male		Female			Total number of participants		of	
Gender	48			52			100		
	18-30	31-4	40	41-50		51-60			
Age	70	19		4		7	100		
	Beginner		Intermedi	ate	Exp	pert			
Technological	18		40		42		100		
Expertise									
	Regular User			First Time	Use	r			
Frequency of Use	61			39		100			
	Birmingham	Cov	entry	London		Manchester			
Location	15	50		25		10	100		
	Undergraduate		Masters	PhD					
Education	53 39		39	8			100		
	Only English			English and other					
Language	16			84		100			

Table 5.25: User Test Phase 1 Distribution

The Tasks set for Users

Based on the PACT Analysis in appendix 5, the following tasks were developed. In Table 5.9 According to Nielsen (2014), turn user goals into task scenarios for usability testing.

The names of the manufacturing and service companies are not included for ethical reasons, as the research was done on a customer level, not the organisations. Due to ethical requirements of the research, no disabled or at-risk individuals were included. The products and services used belonged to companies that identify as customer-centric. All the participants were above 18, spoke English and another language, either in full or part time education, or partly uneducated, and were male or female. Tests were done at the locations chosen by the users. The technology used for the tasks included In-store machines, mobile phone, Tablet, or PC, depending on the Users preference. The tasks were selected based on the expected duration for testing, availability of the product and service, and relationship to everyday activities. The tasks were semi-guided, leaving the users to choose the methods they preferred in carrying out the activities listed in table 5.26.

The research involved 10 product domains from 10 sectors. This was to ensure that the research captured the different characteristics of various products/services/sectors, thereby ensuring that the framework developed is suitable and relevant to different sectors and different activities with products and services. These 10 sectors are only used for the pre-experiment phase. The second usability test involves only 2 sectors, based on the results from the trend analysis.

	Product	Activities
1.	Education sector: academic and non- academic services	 Find information on the list of books for a module Get information on funding and tuition fees Get help for a presentation/coursework Get help to update your CV Apply for a postgraduate research course
2.	Retail sector: Groceries	 Locate a value-for-money product Locate a store close to your home Get information on a product Book a delivery Purchase a product
3.	Telecommunications: Call tariff	 Find the nearest office Find a suitable data plan Find contract terms on a phone plan Information on data speed Get help on a network problem
4.	Health care: Consultation	 Locate it How to get a prescription How to book an appointment for Get help without an appointment Find information about services
5.	Banking: Current account	 Open an account Internet banking Locate nearest branch

Table 5.26: Participants' Activities

		4. Information on charges
		5. Customer service help
6.	Food manufacturing:	1. Information on allergies
	Beverage	2. Find a variety of the product
		3. Find the product in a store close to you
		4. Eat the product
		5. Make a complaint or return
7.	Cosmetics	1. Find a product for acne
	manufacturing: Skin Care	2. Find and use product for your skin type
	Products	3. Find the product within your acceptable price range
		4. Take off the product
		5. Get information on the product online
8.	Mechanical: heating or	1. Change temperature on a product
	cooling systems	2. Get help on fixing a product
		3. Get help on installation of a product
		4. Return a product
		5. Request help from a technician
9.	Electrical: Television	1. Turn on the product
		2. Connect to Wi-Fi
		3. Set up email account
		4. Enter your details on a web page form
		5. Change password or security detail
10.	Automotive	1. Find help with a car problem online or over the phone
	manufacturing: Car	2. Open the boot
		3. Turn up the heat in the car
		4. Use the GPS to get to a location
		5. Fix a baby's car seat

For each task, the assessment metrics were reviewed with the participants, to give their preference and expectations on their experience with the products and services. The respondents were then given the tasks to perform while being video recorded. While the respondents made use of the products and services, the researcher observed their behaviour and expressions. The participants were also aware that they needed to think aloud while making use of the products and services, which they did.

In instances where they grew quiet, the researcher would ask them questions in order to encourage them think aloud and express their opinion on their ongoing experience with the products and services. The tests ended either when the participant was frustrated with the tests, or when they had completed the task, or when the apportion time of 10 minutes elapsed for each task. The 10 minutes was given for each task in to ensure each test sessions lasted 50 minutes, reason being that long tests would bore the participants. This phase- the pilot research- was completed within 9 months.

Post Task Questions

In form of a survey, the users were asked further questions in order to assess and provide more explanation on their experience with the products and services used. The users were asked to assess the questions in Table 5.27 below based on their personal experience with the products and services.

Table 5.27: Post task questions

Post Task Questions						
		1	2	3	4	5
	Difficulties experienced					
	Ability to determine where you were on each task					
	Level of organisation of product and services					
	Willingness to recommend to other users					
	Willingness to use again					
Reco	mmendation by users					

The respondents were thanked for their participation, and assured of data privacy, anonymity, and confidentiality. After the test sessions the video tapes were watched for analysis. This involved the transcription of the observation, the thoughts of the respondents, and the collation of the survey results.

5.2.2 Phase 2: Usability Study

This phase of the usability research is exploratory, allowing deeper data assessment of the effectiveness, efficiency, error tolerance, and engagement of product and services of customercentric organisations. The second phase of user-experience data collection involved another 24 participants. The user tests were conducted with the 24 participants on each of the 4 products tested, making a total of 96 tests and interviews. The observation and interview results were assessed based on the measures set in the methodology chapter, and metrics set by users' preferences in the previous section. Participants responded to questions on 2 categories of products and services: a cleansing clay mask from the cosmetics sector, and; a tariff plan from the telecommunications sector. The tasks include actual use of the products and services and seeking for support for the products and services on their company's websites. Before the tests were conducted, the users were asked if they had any skin allergies, and gave consent to use the products. The participants also made use of similar products and services from competitors for comparison. Products used were purchased from acceptable pharmacies. All data collected is qualitative, based on the users' opinions on their experiences in carrying out these tasks. The participants were first given the tasks to carry out for a product/service. At the end of the set of tasks for the product or service, the interviews were conducted, followed by the next set of tasks for the next product or service. The routine goes on till the interviews are completed for the 4 products and services.

Session outline and timing: the interview sessions lasted for 1 hour per participant. 5 minutes of each session was used to introduce the research, and another 5 minutes for the post-test remarks.

Pre-test arrangements: the interviewees were given an information sheet to review and sign permiting audio recordings of the tests. They were also given background questionnaires to fill.

Time plan: 5 minutes to discuss the goal of the research, process, and fill the background questionnaire.

20 minutes to carry out tasks

30 minutes interview

5 minutes post test questions and debriefing.

Test Environment

The interviews/tests were conducted in convenient locations agreed on by the interviewees and the researcher, or buildings owned by Coventry University. The research took place in Coventry, UK. The interviews were recorded and transcribed. The websites of the organisations served as the method of direct interaction with the companies as chosen by all the participants. The online tasks were done on gadgets (laptop, tablet, or mobile phone) chosen by the participants. The moderator's role was to ask the interview questions and give directions on the tasks.

Task List

Skin care (face mask) – cosmetics

- 1. Apply and take off the face mask,
- 2. Go to website to get support for product
- 3. Find where to purchase the product

Tariff – telecommunications

- 1. Browse with tariff/network
- 2. Go online, attempt to get support for product
- 3. Find where to purchase the product

Sample Size of Usability Study

Proposed user characteristics data to be collected: Gender (M/F), age (18-60), experience (novice/intermediate/expert), and frequency of use (first time/regular), shown in table 5.28.

	Male			Female			Total number of participants			
Gender	12			12			24			
Age	18-30 31-40		10	41-50		51-60				
	13	6		3		2	24			
Technological	Beginner Intermedia		te Expert							
Expertise	4 12			8		24				
Frequency of Use	Regular User		First Time User							
	17			7			24			

Table 5.28: Participant Characterization

Interview Questions

Participants first assessed the products based on the questions listed in Table 5.29 below. The questions were derived from the first version of the framework in section 3.2.2. These questions served as the follow-up post task questions, and participants were asked to rate their experiences with the products or services based on the questions. This was also done to ensure the validity and reliability of the results.

Table 5.29: Framework-based Assessment Questions
Assess the ability of the product to meet your needs?
Assess your engagement with the product?
Assess the uniqueness of the product/service?
Assess the ease of learning of the product/service?
Assess the accessibility of the product/service and assortment of channels in accessing it?
Assess the need for support with the product/service?
Assess the availability/access to support when using the product/service?
Assess the response from support?
Assess the need for minimal resources when using the product/service?
Assess the interaction- delivery/problems encountered with the product/service?
Assess the interaction- speed/timing of the product/service?

The interviewees were then guided by the following questions for all four products/services. These

interviews were guided by the targets in the first version of the framework in section 3.2.2. however,

these targets and their categorisation were improved based on the user tests.

- 1. What do you consider good experience with a product/service?
- 2. What did you think about the product/service?
- 3. What were your expectations from the product/service?
- 4. How did the product/service meet your expectations?
- 5. How did the product/service fail in meeting your expectations?
- 6. How could your experience have been improved?
- 7. Thought of suitability/satisfaction
- 8. Thought on ease of use
- 9. Thought on time
- 10. Thought on support provided
- 11. Clarity of the instructions
- 12. Ease of finding information

The interviews were analysed qualitatively using thematic analysis. As described in the methodology, One-way ANOVA tests were also conducted on the interview data.

5.3 Phase 1: Pre-Experiment Content Analysis Results

Results from the user tests conducted in phase 1 were obtained from a trend analysis to aid in the assessment of outcomes of the organisations strategy on product development and service design. The users were recruited based on PACT Analysis conducted, which can be found in appendix 5. The user distribution can be seen in table 5.26 below.

The Content Analysis involved turning the responses of the participants into quantitative variables. The think-aloud protocol resulted in both quantitative data used in determining user preferences, and sectors with the best and worst customer-experiences. Based on the opinions of the users, the benchmarks for measurement are in table 5.30 below. On average, the users agreed that the maximum attempt on a task with a product or service should be 3 trials, and would prefer to complete a single task with a product or service within 5 minutes. The users also stated that they would prefer to spend no extra cost on a product or service after purchase. Furthermore, despite the number of attempts, the users stated that they would prefer to complete each activity on a product or service, allowing a maximum of 1 error.

The users further stated that they would prefer to complete the task without support, but however expect support to be available. Furthermore, based on their responses, the average acceptable attempt to accessing help is one successful trial, and all the users expect response from the handlers within the first attempt. All the users expected the products or service to meet their needs, and should be able to reuse, and the products or services should either be similar to their competitors or better than the competitor's products.

Task	Users preference	Comment
Attempts on tasks	At most 3 attempts	On average, participants suggest that the average number of attempts on a given activity with a particular product or service should not exceed 3 times. According to the users, an excess of 3 attempts translates to poor usability whether for first time users or frequent users, and as such, negatively affects their experience with the product or service.
Average time on task	At most 5 minutes	Participants suggested that the maximum amount of time that should be spent navigating through a product or service in order to carry out a task should not exceed 5 minutes. According to the users, time spent understanding and navigating a system in order to carry out a task largely influences their experience with the product or service.
Monetary expenses on the task	£0.00	According to the participants, there should be no necessary additional costs after a product has been purchased. Usually, businesses include certain add-on features to their products and services that need to be purchased. On average, users find that they lose interest in many of the products when they find that they need to spend more in order to use the product or service.

Table	5.30:	Users'	Preference
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Correctly accomplished task	1 user average	It was expected that every user that attempts to carry out a task on a product or service should be able to do so correctly.					
Errors encountered in task	2 errors at most on average	It was also expected that the maximum number of errors allowed with the use of a product or service should be 2 errors. The participants, on average, were of the opinion that when the product has multiple errors, then it is not reliable, thereby having poor usability, and affecting the quality of their experience with the product or service.					
Completed without support	1 user average	All participants suggested that products should be easy enough to use without support for all customers.					
Access to help (Attempt)	1 user average	All Participants suggested that in as much as there should be no need for support, support should be made available. On average, it was suggested that support must be accessible by all users for a product to meet usability goals.					
Response from guide	Yes	All the participants believed that when users attempt to access support or help with the use of a product or service, there should be a timely, reliable, and satisfactory response from all sources of support provided.					
Customer expectations on needs (Thought)	Yes	Participants were of the opinion that the products should meet their expectations, based on what the service or product has been described to do, and general knowledge of what such products and services should do.					
Customer adaptability to product (Thought on reuse)	Yes	Participants find that their willingness to reuse a product is usually because of a positive experience with the product or service.					
Comparison to competition (Thought)	Similar	Participants were also of the opinion that when a product or service goes beyond what competition or substitute products can offer, the product is innovative and positively affects their experience.					

In the following sections, the results from the user tests are analysed based on the average results for each task. The average on each task was obtained by adding the findings for each task and dividing by the number of users for each product or service, 5. These metrics are applied to the results of the user tests, to assess user-experience with the products and services. The products and services used are everyday products and services that are easily accessible to the users. The users do not belong to any particular group based on the ethics requirements of the research.

Metric	Measures	Average: Performance of Sectors based on 100 user tests									
		Academic	Bank	Health	Telecom	Retail	Food	Mechanical	Electronic	Cosmetics	Car
Efficiency	Number of attempts on tasks	Good	Good	Good	Poor	Good	Poor	Good	Poor	Good	Poor
	Average time in using product or service	Poor	Poor	Poor	Poor	Poor	Poor	Good	Poor	Good	Poor
	Resources spent after purchase of product	Good	Good	Poor	Good	Poor	Good	Good	Good	Good	Good
Effectiveness	Ease of learning	Poor	Poor	Poor	Poor	Poor	Poor	Good	Poor	Good	Poor
	Easy access to sources available	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Engagement	Customer expectations on needs	Poor	Poor	Good	Poor	Good	Poor	Good	Good	Good	Poor
	Customer adaptability to product	Poor	Poor	Poor	Poor	Poor	Poor	Good	Good	Good	Poor
	Comparison to competition	Poor	Poor	Good	Poor	Poor	Poor	Good	Good	Good	Good
Error	Efficiency of use for the first time	Poor	Poor	Poor	Poor	Poor	Poor	Good	Poor	Good	Poor
Tolerance	Access to help or user guide to recover from errors	Poor	Poor	Good	Poor	Poor	Poor	Poor	Poor	Poor	Poor
	Number of errors encountered in accomplishing	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor
	each task										
	Response from guide in solving problem	Poor	Poor	Good	Poor	Good	Poor	Good	Good	Good	Poor

Table 5.31: Usability Problems in Manufacturing and Service Sectors
The results for each sector can be found in appendix 7-16, and a summary of the results is discussed in the next section. The findings for each of the sectors were summed up, and the average was used in making conclusions on the findings for the sample of manufacturing and service companies' customer-centric strategies in the UK. The appropriateness and outcomes of strategies used by of the sample of manufacturing and service companies in the UK are poor in relation to userexperience. This is a significant finding and will be referred to in the discussion section (7.3) of the conclusions chapter. From the table 5.31 above, it can be seen that some sectors perform better than others in certain aspects of their strategy. It shows the sector with the best performance was the cosmetics sector, and the sector with the worst performance was the telecommunications sector. These sectors were used as the basis for the interviews, which are analysed in the next section.

5.4 Phase 2: Usability Study Results

From the questionnaires analysed, the results show that the sampled manufacturing and service companies' have poorly developed and implemented customer-centric strategies. The aim of this section is to present and analyse data collected to determine what aspects of their customer-centric strategies fail, based on customers' standards, by conducting interviews to explore and assess customers experience with products and services. In this section, user tests are analysed, with regards to Efficiency, Effectiveness, Engagement, and Error Tolerance of the products and services from selected customer-centric organisations, as discussed in the methodology chapter. This section aids in achieving objective 3 which is to *construct and apply usability methods for assessing appropriateness and outcomes of strategy to help enhance products and services for improved user-experience*.

Aside from identifying user-experience problems, the aim of the interviews is to demonstrate how the user-experience measures can be applied in strategy measurement. Over time, problems evolve with products, making users feel less interested in the product or service as was found by Sonderegger et al. (2012). For this reason, the products and services were assessed both with first time users and regular users. It is impossible to change human feelings; however, it is possible to have a process that checks when and how these feelings can change over time (Lesaigle and Biers 2000). This has been identified as a driver of the business environment in the literature review, under the dynamism of the business environment. The usability testing process can be applied over time to assess user-experience with products and services (Tyne 2010). For the purpose of clarity, the research does not seek to measure the process of developing the strategy.

Rather measurement in this sense applies to the strategy after it has been developed- in terms of appropriateness of the strategy, and after it has been implemented- in terms of outcomes of the strategy. The research is about product and service design, not process design. Therefore, the research is about the users and the use of the product, and not the employees and the implementation of a strategy.

5.4.1 One-way MANOVA Multivariate Tests

The interviews were conducted with 24 participants on each of the products and services, making a total of 96 user-tests and interviews. The product with the best usability assessment based on the initial analysis was from the cosmetics sector, and the worst performing was from the telecommunications sector.

The results were analysed using one-way MANOVA, to determine significant differences between user-experience and factors such as age, gender, technological expertise, and frequency of use of the products and services. The gender variables (male/female) were coded and represented with numbers (1, 2 respectively). These were also set as nominal measures. Frequency of use was also coded for beginner and intermediate (1, 2 respectively), and were set as ordinal measures. Age was set as an ordinal measure (18-30=1, 31-40=2, 41-50=3, 51-60=4), as well as the level of technological expertise ranging from beginner to intermediate, to experts. The Wilks' Lambda multivariate test was conducted, and can be found in appendix 17. The results show a statistical difference in user-experience based on users' age, *F* (33, 192.06) = 1.681, *p* < .0005; Wilk's Λ = 0.474, partial η_2 = .220; and technological expertise *F* (*22, 130*) = *2.582, p* < .0005; Wilk's Λ = 0.484, partial η_2 = .304, but not gender or frequency of use. Further analysis was conducted to determine the extent of these differences. The complete analysis can be found in appendix 17.

5.4.2 One-way ANOVA

The results were analysed using one-way ANOVA, to further determine significant differences between user-experience and factors such as age, gender, technological expertise, and frequency of use of the products and services. One-way ANOVA results as shown in appendix 17 were conducted using SPSS. The independent sample tests were conducted using Mann-Whitney U test for gender and frequency of use, and; Kruskal-Willis tests for age and level of expertise. Both tests however displayed asymptotic significance, showing the sample size was adequate, with significance levels of 0.05. The results show no significant difference in Gender across all user-experience factors except product interaction measured by speed/timing of use (p = .002), unlike the MANOVA analysis.

This would mean that there is a statistical difference in the results of male and female participants in their interaction with the products and services in relation to speed and time of the products and services. Age however is same across all factors, no exceptions, unlike the MANOVA analysis. This means experiences were the same for the respondents irrespective of their age grades. The complete results can be found in appendix 17.

Similar to the MANOVA analysis however, the level of technological expertise is same across all except access to products/assortment of platforms. There was a statistically significant difference between groups of technological expertise as determined by one-way ANOVA (p = .020). Beginners, intermediate users, and expert users of technology have different experiences with products and services when attempting to access the products and services, and locating channels for access. Contrary to the MANOVA analysis, frequency of use is same across all groups except need for support, access to support, need for minimal resources for use, and interaction- delivery/problems. There was a statistically significant difference between first time users and frequent users as determined by one-way ANOVA (p = .003), ANOVA (p = .020), ANOVA (p = .006), ANOVA (p = .021) respectively. The complete results can be found in appendix 17.

5.4.3 Tests of Between-Subjects Effects

The test of between-subjects effects was carried out to determine how the dependent variables differ for the independent variables. The results show no significant difference between dependent variables age and frequency of use, and the independent variables representing user-experience. However, there was a significant difference in need for support with products and services based on gender (p=0.19). There was also a significant difference in the uniqueness of products and services based on technological expertise (P=0.38), and a significant difference between accessibility of products and variety of channels and technological expertise (P=0.38). The complete results can be found in appendix 17.

5.4.4 Interview Results Post Hoc Test

To show which groups differ from each other, the post hoc test was run. The significance levels found in this test were the final recognized results. Tukey post hoc tests were carried out. A score of 0.58 (male, female) in mean difference in gender for product interaction-speed explains the significant difference found in the post hoc test. Speed was rated higher by male respondents than female respondents.

The post hoc test found no significant difference in age grades and user-experience factors. A score of 0.43 (intermediate, expert) in mean difference in technological expertise for accessibility of product and variety of platforms explains the significant difference in post hoc test.

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Accessibility was rated higher by intermediate users than expert users. A score of 0.66 (first time users, regular users) in mean difference in frequency of use for needing for support with product explains the significant difference in the post hoc test. Minimal need for support was rated higher by first time users than regular users. A score of 0.55 (first time users, regular users) in mean difference in Frequency of use for access to support explains the significant difference in the post hoc test.

Access to support was rated higher by first time users than regular users. A score of 0.65 (first time users, regular users) in mean difference in Frequency of use for needing minimal resources explains the significant difference in the post hoc test. Minimal resources required was rated higher by first time users than regular users.

5.4.5 Factor Analysis

The respondents weighed the following on a scale of 1-5. The results were analysed using the Factor Analysis and shown below, to determine how best to organise the targets and goals on the framework. The analysis resulted in four components which were termed error tolerance, ease of use, effectiveness, and efficiency. When rotated and grouped by highest correlations, the following factors are used for the third version of the framework developed in section 5.8.

Table 5.32: User Test Factor Analysis

	Component				
	Error	Ease of	effective		
	tolerance	use	ness	Efficiency	
	1	2	3	4	
Ability of the product to meet your needs		.605			
Engagement with the product		.911			
Uniqueness of the product service		.917			
Ease of learning of the product service			.748		
Accessibility of the product service and				.917	
assortment of channels					
Need for support with the product service	.501				
Availability access to support	.915				
Response from support	.899				
Need for minimal resources			.829		
Interaction delivery problems	.790				
Interaction speed timing				.663	

Rotated component matrix^a

5.4.5 Template Analysis

The interviews conducted with the 24 participants for each product. They were asked questions regarding their views on good experiences with a product/service and interaction with a company.

The interviews were also more detailed to assess the products and services in terms of how they met or failed to meet the users' expectations, and how these experiences could be improved. The respondents were also asked to define factors that they expected from the products/services that could form efficiency, effectiveness, ease of use, or error tolerance. The responses are analysed in the following subsections. The data aided in refining and defining the usability measures, as well as assessing the experience of users with customer-centric organisations. The data showed how user-experience reflects the outcomes of organisations customer-centric strategies, and will be used in improving the model developed in this research.

Efficiency

The major defining term attributed by participants to efficiency was speed. According to participants, speed of a product or service or support being rendered by the organisation directly or through a third party is very important in defining experience with the product and directly influences interaction, not only with the product or service, but also with the organisation. This was one major area the product with the least results failed. The telecommunications company could not necessarily compare with the competing company because of poor quality network. The problem was beyond their primary service (network). The users found problems with the online top up, which they felt affected the efficiency of the product. This is because they would have to leave the comfort of their technology, and get recharge cards from the stores. The lack of this variety of options significantly displeased the interviewees, and shows the performance of the sales and distributions strategy of the organisation.

According to the interviewees, this strongly affects the ability of the service provider to meet users' needs, which is important to users to be able to assess a product as efficient, and able to provide a good experience. Therefore, according to users, interaction with a company is largely influenced by the efficiency of the products and services they provide in terms of speed, and ability to meet users' needs through numerous platforms and substitutes. This can significantly be achieved by developing and implementing appropriate service design and product development strategies. Users find that the ability of a service or product to give options while tasks or activities are being carried out speaks to the efficiency of the product or service. Some users however still found the telecommunications provider good enough to provide basic services, even with the speed of their network, support, and general service provision, reflecting the operations strategy of the organisation.

This was because their expectations from the providers is limited to the basic provision of a method of communication. This proves that customers' experience is basically influenced by the ability of the product and service to need their expectations. This was verified with responses to users experience with the products and services from the cosmetics sector.

An important lesson from this finding is that expectations differ. These users found the product effective in the sense that it provided basic services, so were not bothered by the problems with efficiency. However, more users prefer the product to be efficient as well as effective. The product from the best sector (clay mask) dried faster than the product from the second organisation in the sector, making the users find it more efficient than not only the product from the other cosmetics company, but also both services from the telecommunications sector.

It was found that users want to spend little time executing tasks with products and services, few attempts on these tasks, and variety of channels to access the product, perform tasks, get information and support for using the products and services, and variety of the product or services so they have the option to choose. However according to a user, manufacturing and service companies in the UK do not give the level of customer-experience and this can generally be attributed to the in ability of the organisations to apply customer knowledge in designing the products and services. The users find that when they call the customer care for the company with the least experience, the wait times are long, and their problems recur. They also find that the telecommunications company actually has a variety of services, but these do not capture all their calling and data needs, compared to some other service providers. The product from the cosmetics they expected from a clay mask. Users were more impressed by the fact the product was accessible from the cosmetics retailers of their choice, and according to users is a major influence in their decision to try other brands.

Effectiveness

The second theme of the interviews was effectiveness. Similar to efficiency, users find a product effective when the product meets their needs and expectations. However, rather than speed and accessibility, the user referred to the ease of learning and the lack of errors when using the product or service. The users found the telecommunications services easy to learn. This was the basic activities such as topping up of airtime and data, checking data and airtime balance, calling customer care, using my accounts to find information on their contracts or mobile usage. A few users however had contrary experiences. According to these users, the top up steps were not always easy to remember, especially the data plan top up. According to one user, this is a major reason why the product from the other telecommunications provider is preferable. The second telecommunications service allowed contract plans, thereby eliminating the need for regular airtime and data top up.

The user who had been a regular user of both mobile plans found that this method to be more effective, especially with the fact that the contract plan was cheaper, and also reduced the frequency of lack of airtime or mobile data. This reflects success in both the pricing strategy of the organisation and the operation strategy as well. User also found that the cosmetic products were easy to learn to use because the directions for use were simple and easy to remember and understand without constantly referring to the instructions. This relates to the design and aesthetics of the products and services, and thereby would require the development and implementation of appropriate product development strategies and aesthetics strategies.

According to the users they also had good experience with the cosmetics products especially because they were not falsely advertised, thereby meeting their expectation in terms of texture, features, and design. The users find that the product was also reliable based on this effect. This simply relates to the marketing strategies of the organisations. According a user, because I knew what exactly the product could do for me, the inability to yield further results was not considered an error or problem, and in a sense made it easy for me to understand and use. However, the telecommunications provider with the worst result gave assurance of speedy network and good coverage, but was unreliable because this was not the case in most areas the users attempted to make use of it, reflecting not only poor marketing outcomes, but also poor operations results. The users also found their customer service unreliable because they were unreachable, which was unexpected for an organisation that claimed to be customer-centric. This also related to the responses from users on minimal resources required for use. The users were of the opinion that the telecommunications company that provided contract plans also had normal plans that did not require direct debits, giving users options which refers back to accessibility and variety, but strongly shows effectiveness in the organisations operations strategy.

The point to be made here is that the contracts or plans from this organisation are sufficient, for monthly use, and would not require frequent airtime recharge, thereby allowing minimal resources for use. The users referred to resources in terms of mental resources, linking to the ease of learning, and ease of use in the next section. According to users, when I do not have to exert much mental power to learn or use a product, I enjoy my experiences with the products or service. The products should not create additional tasks, but aid in carrying out tasks. The minimal resource required for use was linked to the value of the product, meaning price. According to the users, a product that does not require more payment after purchase or extra mental effort than should normally be required, can be called cost effective and gives the expected value for money. The cosmetics products were found to be cost effective because they were sufficient for reuse, provided expected results within one use, and did not require extra mental effort to learn how to use.

Users find that manufacturing and service companies generally lack the ability to meet their userexperience needs in terms of providing easy to learn product and services, reliable products and services, and valuable products and services.

Ease of use

Ability to meet needs was also the underlying factor behind ease of use of a product or service. Users find the product easy to use if it is satisfying, engaging, and unique. The users found the product from the second cosmetics provider and both telecommunications organisations to be similar to those of other organisations in their sector.

According to the users, the product from the best cosmetics company was unique in design and performance. Users found the concept of a 'clay' mask different from the usual face masks. More so, they liked the feel of the product, and the results. Users generally considered the product innovative. This can largely be associated with innovation strategies in terms of product and process of product development. However, the users found the other cosmetic company's product basic, and some compared it to regular soap. However, they also suggested that this made it easy to use. On the other hand, they found the unique product to be engaging due to the difference in texture and feel. This made the users touch their faces continuously, or read the packet frequently. They found the nature of the product interesting, and thereby satisfying. According to the users, a *product is also easy to use when it is easy to understand with little or no assistance necessary.*

In reference to error tolerance in the next section, users find that when said help is easily accessible, they tend to be satisfied with the product or service. Users add that a *product is easy to use when it is the right size, portable, with good visuals and design, and reliable.* According to the users, the *uniqueness of a product can make me switch brands; however, this depends on how engaging the product turns out to be.* The users find that ease of use of a product or service is linked to its design or aesthetics. This can be achieved by developing and implementing relevant and appropriate aesthetics strategies for their products and services. The users find that a product or service is easy to use when it is interesting and engaging. According to users, a product is interesting to use when manufacturer or service provider to understands their needs, and can be seen in organisations that maintain adequate customer relationships.

Users find that a service provider with a good relationship with their customer tends to produce more engaging products or services. In addition to this, poor services lacking politeness, patience, promises, and call-backs affect users' experiences with the services, and therefore their perception of the organisation. Generally speaking, this would require the development and implementation of appropriate customer relationship strategies, in order to understand the nature of users, and what they would expect from the product and services. With regards the telecommunications company, the users' needs included good network connection, customer care, internet, and coverage everywhere, and as a result rated the second telecommunications company better than the first. Engagement according to users includes promotions, services, bonus plans, and are reasons for reuse. Customers find that these factors of engagement, uniqueness, and satisfaction differ for products and services, but can be centred on the abstract factor of meeting users' needs. According to the users, most products and services in the UK do not give the kind of experience expected, usually due to unfriendliness of use, and unattractiveness of the products and services, which largely influence their decision to remain loyal to a brand.

Error tolerance

An error tolerant design allows a product to continue functioning even in the presence of faults. This means that errors are not completely zeroed out, but are 'friendly', 'simplistic', or having relevant 'assistance'. This definition was discussed with the users generally, and specifically to the products/services that were tested. The users agreed with this definition. Based on users' expectations, products/services do not need to be error-free, however the less the errors present, the more preferable the product/service is to users. Achieving this would require the implementation of appropriate operations strategies especially for services, but more importantly, the implementation of realistic product development strategies will significantly aid in reducing errors in the product and service. According to users, product/service interaction is reflected in the error tolerant performance or delivery of the product or service. In reference to the telecommunications service with the least results, most of the users (frequent users) found their performance poor in the sense that the network is good in some areas, but poor in others. Some of the locations in which the users attempted to receive calls using that network provider yielded poor results. This was found to be a significant problem because the service delivery was really below user expectations, and the errors encountered were beyond tolerable by the users. A few users also found some performance problems with the cosmetics, but ruled them as tolerable. The users found that the products left their skin dry, but were of the opinion that they could solve that problem with moisturisers. However, the users were of the opinion that this should have been included in the instructions. Users say that products/services with good performance would still be expected to have some form of support which could come in form of instructions of the product, online/email/website support, or phone call support. Users found that the cosmetic products did not necessarily state the amount of the product to be applied. This was a common problem found by first time users. Frequent users found that because the product was easy to learn, the problem of quantity in application did not recur.

The users found the first telecommunications service to be poor because their customer service was slow to reach both in the case of emails and phone calls, reflecting poor IT support and systems. Furthermore, users add that this support provided by the manufacturers or service providers should be easy to understand, quick to respond especially in the case of emails, phone calls, and in-person support, and easy to navigate websites. Users prefer that this support should be reliable and give the assurance that the problem would not recur. Frequent users found the second telecommunications service to be poor because though I was able to get through to their customer care, and satisfied with the solution in that time, I still had to deal with the same problems over time. Another user actually found that the service provider has a link on the portal that users can click for a 'network quality assessment'. The assessment identifies the network problem and solves it, thereby improving the quality of the network.

The users also find that sometimes, the customer care representatives do not seem to have solutions to their problems. Users find it most annoying when a similar problem had been solved previously by another customer care representative. This would mean that the organisations have a poor knowledge management system reflected in knowledge sharing and knowledge reuse. In general, however, users prefer that these products or services being rendered have fewer errors or problems, requiring less need for support. Most users suggest that the better the design of the product or service, the fewer the errors that would ensue. A good design can be achieved by developing and implementing appropriate aesthetics strategies. Users find that manufacturing and service companies in the UK fail in ensuring this level of error tolerance, thereby hindering good user-experience. Users find that products, especially services are unreliable, and have poor communication capacity especially from employees.

5.6 Evaluation: Research Question 3- Application of Usability in Assessing Strategies

This section shows how results from both usability studies answer research question 3: 'How can usability methods be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience?' The development and application of usability methods in assessing the appropriateness and outcomes of a customercentric strategy in order to help enhance both products and services for improved user-experience is evaluated in this section. The section covers the description of appropriateness and outcomes of a strategy, how usability methods can be applied in the measurement process, and the userexperience factors that can be used in measuring customer-centric strategies.

The results from the survey correlate with research by (Kaplan and Norton 2006; Netshitomboni 2014; Rajasekar and Khoud 2014; Raps 2004; Slatar, Olson and Hult 2010) that suggests that strategies fail because of poor execution/implementation, and or weak/inappropriate strategy.

The development of weak/inappropriate/unachievable strategies usually arises due to the lack of realistic and honest assessments of the firm. This could be as a result of findings by Bell, Dean, and Gottschalk (2010), that organisations find strategy implementation to be complicated and time consuming, and are delayed by organizational culture, uncertainty, leadership style, human resources, information availability and accuracy, organizational structure, and technology. It is therefore necessary to determine how strategy can be developed in order to be appropriate, and implemented effectively to enable successful outcomes.

The survey data suggests that a customer-centric strategy is appropriate if it reflects the business objectives and business culture, when it is simple, adequately employs resources available, can provide competitive advantage, meet success factors, and is the right fit for the environment. The usability studies data further suggests that a customer-centric strategy is successful when the products and services are attractive and friendly to use, reflecting product and service engagement; when the products and services meet feature and design requirements, reflecting efficiency; when knowledge management is effective, and employees are productive, reflecting product and service error tolerance, and; when the information systems capabilities are properly employed, reflecting product and service effectiveness.

Engagement, error tolerance, effectiveness, and efficiency are the success factors on which this research proposes the model for measuring the appropriateness and outcomes of customer-centric strategies. These factors are linked to the success of customer-centric strategies which relate to key departments of an organization. The usability study suggests that all the stages of interaction with customers to some extent include the use if IT, and for this alone, requires user-experience- even in the sense of human factors. Looking beyond IT as well, usability of the products and services, driven by user-experience is also important for improved customer-experience. Executing a customer-centric strategy therefore requires all fronts of interaction to perform at optimum. In this sense, assessment of product and service in use represents interactions with the company. This would be through the products, services, and communication with the company.

A generic customer journey could be: awareness of product, query, pricing, purchasing, post-sales support, complaint, upgrade, renew, and repurchasing of product. Each of these phases requires the organisation to deliver products and service that are efficient, effective, engaging, and error tolerant. From the usability studies conducted:

- 1. Efficiency could be measured in terms of time, success rate, minimal resources spent on each of the phases.
- Effectiveness could be measured in terms of ease of learning, and accessibility of each of the phases.

- 3. Error tolerance could be measured in terms of response rate, error rate, access to support, and success rate without support in each of the phases.
- 4. Engagement could be measured in terms of ability to meet needs, willingness to reuse, comparison to competition in each of the phases.

The research looked at user-experience both in the sense of product development and service design. User-experience is usually assessed in terms of experience with products and websites, but, importantly in this research, it has been shown that it is applicable to products as well as services. Furthermore, the research showed how the inclusion of customers in improvement of product design helps facilitate an improvement in strategy. This is novel based on the fact that customer participation is carried out separately for the improvement of a product, but not applied in terms of strategy. This also included the three strands of usability testing: Subjective assessment e.g. Interviews, test performance in terms of interaction with the system, the design of the product to make use easier, and; Physiological strand.

This was used in both usability studies alongside the AB test in usability. 'A' is asking customers what they expect in terms of time, attempts, frustration. 'B' would be the change to be introduced in terms of errors, etc. Usability methods could be qualitative or quantitative as applied in this research. The research took user-experience and usability from an operational level to a strategic level, assessing organisations' strategies based on usability principles used in developing performance metrics. This linkage between user-experience and strategy measurement is important because organisations would not only gain by satisfying their customers, which in turn leads to retention and acquisition of customers, but it will improve business performance through an improvement in the quality of customer-centric strategies.

The model in this research aims to solve these problems faced with the development and implementation of inappropriate customer-centric strategies as discussed in section 2.8.7 of the literature review and 3.2.2 of the methodology chapter. The need for the framework therefore is self-evident, based on targets for success, and where elements of strategy have been measured by usability factors. Improving product and service design requires appropriate strategies. The feasibility of incorporating user-experience factors in strategy development tools found to be relevant from the analysis is evaluated in the section.

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5.7 Assessment of Strategic Management Models for Customer-centric Strategy Development and Implementation

The extent to which user-experience can be incorporated in existing strategy development models can improve the product development and service design. If a number of strategy models have usability targets built into them, the criteria can be used in assessing the appropriateness and outcomes of customer-centric strategies, and the likely impact on of user-experience. In this section, a comparison across different strategy models that have low/med/high usability targets integrated within the models will allow for a more detailed analysis of the end-product. The purpose and expected outcome are that the more usability factors that exist within the strategy model, the higher the expectation that the products associated with this approach will possess greater degrees of usability, thereby improving customer-experience. Table 5.33 contains appropriate development and implementation tools of customer-centric strategies.

			Advantages				
	Not used	Low	Time	Popularity	Considers	Appropriateness	Recommended
		factor			resources		
		score					
PEST			Yes	Yes	Yes		Yes
Scenario Planning	х	х					
Porter's 5					Yes		Yes
Customer Journey Map	х						
TOWS matrix	х						
Value chain						Yes	Yes
VRIO		х					
Personas		х					
Cost Benefit Analysis			Yes	Yes	Yes	Yes	Yes
Porters Generic			Yes		Yes		Yes
Bowman's Clock			Yes		Yes		Yes
Ansoff			Yes		Yes		Yes
Strategy Diamond	х	х					
Balanced scorecard			Yes	Yes	Yes	Yes	Yes
Strategy mapping		х					

 Table 5.33: Tools for Customer-centric Strategy Development and Implementation

The ability to incorporate UX targets is evaluated below on a scale of not applicable, low, medium, and high. This assessment in table 5.34 is subjectively based on the targets developed from literature and data collected.

	PEST	Porter's 5	Value chain	Cost Benefit Analysis	Porter's Generic	Bowman's Clock	Ansoff	Balanced scorecard
		Abilit	y to incorp	orate UX fac	ctors (Feasik	oility)		
			Efficiency o	f products a	and services			
Accessibility	Medium	High	High	High	High	High	High	Low
Speed	Low	Low	High	Low	Low	Low	High	High
		Ef	fectiveness	of products	and service	es		
Reliability	Low	Medium	High	High	Medium	Medium	Medium	High
Value	High	Medium	High	High	High	High	High	High
Ease of learning	High	Medium	High	Medium	Low	Low	Medium	High
		E	ase of use of	of products	and service	s		
Engagement	Low	Medium	High	Low	Low	Low	Low	Medium
Uniqueness	Medium	High	High	High	High	High	High	Medium
Satisfaction	High	High	High	High	Medium	Medium	Medium	High
		Err	or toleranc	e of product	ts and servi	ces		
Delivery	Low	Low	Medium	Low	Medium	Medium	Low	High
Availability of support	Low	Low	High	Medium	Low	Low	Low	High
Minimal need for support	Medium	Medium	High	Low	Medium	Medium	Low	Medium
Response from support	Low	Low	High	Low	Low	Low	Low	High
				Average				
Feasibility	Medium	Medium	High	Medium	Medium	Medium	Medium	High

 Table 5.34: Feasibility of Incorporating UX Targets in Customer-centric Strategy Development and Implementation

PEST analysis is found to be relevant in analysing the macro environmental (Political/Legal, Economic/Environmental, Socio-Economic, Technological) targets required to ensure a strategy is appropriate. In order to incorporate UX targets in the strategy development and implementation process, PEST analysis can be highly applicable in ensuring a product resulting from strategy is easy to learn, of value, and satisfying to users, based on an assessment of demographic targets to be considered when developing easy to use products. The PEST analysis would be relevant in trend-scaping. This would involve identifying needs of users and customers, and defining experience principles. It would also very important to identify technology developments and assess current technological environment from the PEST analysis. Porters 5 forces is relevant in assessing micro environmental targets (buyers, competitors, suppliers, new entrants, substitutes) to be considered when developing strategies and considering UX factors. This is especially because of the ability to assess the bargaining power of buyers when using the model. In this sense, it can be highly useful in planning the accessibility of products and services, uniqueness and satisfaction.

Value chain analysis is a diagnostic tool that considers primary and support activities that add value to their products and services.

As a result, it can be highly relevant in planning for efficiency, effectiveness, error tolerance and engagement of products and services. Cost benefit analysis is applied when estimating the viability of strategy alternatives. The model is highly feasible when assessing the viability of the investments to enable accessibility of products and services, reliability, value to customers, uniqueness and satisfaction. Porters generic and Bowman's clock are applied in the major development of business strategies. They consider strategies in the line of cost, differentiation, and target market. When developing strategies in any of these routes, the framework can help plan towards accessibility of the products and services, value and uniqueness. Ansoff's matrix is applied in the making strategic choices before implementation. It considers strategic options such as new product development, market penetration, market development, and product diversification. These broad options can be highly feasible to include the user-experience targets such as accessibility of the product and service, speed, value, and uniqueness.

Balanced scorecard is a strategy implementation tools that considers four broad perspectives: financial, customer, learning and growth, and internal processes. The tool is highly feasible to incorporate product and service speed, satisfaction, all effectiveness targets, and all error tolerance targets.

5.8 Conceptual Model Version 3

Improved customer-experience requires the targets discussed in section 3.2.2: speed; delivery; accessibility; reduced need for support; lack of errors; reduced need for additional resources; easy learning; satisfaction; engagement; uniqueness; access to support, and; response from support. From the research conducted, product/service efficiency, effectiveness, error tolerance, and engagement can measure the ability of customer-centric strategies to achieve these results. From the results, the success and appropriateness of a customer-centric strategy depends on the implementation of the strategies identified in figure 5.37 below. Information systems allow organisations implement business strategies. Information systems strategies are successful when information resources are properly applied to the provision of information services.

Customers' experiences are improved through these information systems when sources of information are reachable and operational. An information systems strategy also influences the successful implementation of an operations strategy in this respect. Information system strategy is most essential, because other strategies perform properly through it. A customer knowledge management strategy relies on information systems, but is crucial to the success of providing positive customer-experience.

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Effective knowledge management is reflected in quality and speed of communication, and reliability of the information given to the users. Both IS and CKM strategy influence the implementation of operations strategies, reducing the need for support. The design and features of the product or service reduces the need for support and reflects the success of the operations strategy.

Product development strategies are successful when the product or service is interactive in terms of speed and delivery, both of which would highly require appropriate manufacturing, information, and knowledge management systems to achieve. Regarding performance or delivery, aesthetics strategies have a role to play. The product, when developed, has to be easy to learn, and satisfying to use. If achieved, an aesthetics strategy is successful, and similar to other targets would require CKM and IS for success. Customer-experience is also defined by uniqueness.

Customer-experience	Target	Con	Company Assessment		Related strategy
		L	Μ	Н	
Access to support	Reachable Operational				IS/IT
Response from support	Speedy response Helpful Communication Reliable				СКМ
Reduced need for support	Design Feature				Operations
Product/Service Speed	Interactive Fast				Development
Performance/delivery	Interactive Functional				Design
Ease of learning	Features Design				Aesthetics
Satisfying	Meets expectations Brand and design				Aesthetics
Uniqueness	Different Functional				Innovation
Value	Mental effort Cost effective Value for money				Pricing
Lack of errors/Reliability	Reliable Functional				Operations Marketing
Product/Service Accessibility	Variety Platforms Channels				Distribution
Engaging	Interesting Reuse Recommend				CRM
Error tolerant	Efficient E	ffectiv	<i>ie</i>		Easy to use

Figure 5.37: Conceptual Model Version 3

A unique experience equals successful achievements of innovation strategies, and is achieved when the product or service provides something new, but yet functional. This shows the link to the product development strategies as well.

A good experience is also derived by the value derived from the product or service. This is defined by the cost effectiveness and the amount of mental effort exerted for use. The pricing strategy of the organisation would be successful when these targets are met. The aesthetics strategy plays a major role in achieving this as well. The operations strategy as well as the marketing strategy is successful when the product or service lacks numerous errors, or is reliable. This would also depend on the product development strategies employed. The success of an operations strategy is also measured by the accessibility of the product or services. When a variety of the product is manufactured to meet diverse needs, the strategy is successful. Furthermore, when they are numerous platforms in acquiring the product or service, the sales and distribution strategy is successful.

An information systems strategy needs to be properly implemented to achieve the targets. Lastly, the product or service engagement equals success of CRM strategies. This is because engagement is defined by how interesting the product or service is. When customers find a product or service interesting at every level, they tend to allow the relationship foster, thereby building commitment and loyalty to the brand or organisation. This leads to product or service reuse and recommendation. Knowledge management, innovation, information systems, and operations strategies would also strongly enable the achievement of these targets

Strategy delivery can be improved by co-creation of products and services. The best way to improve customer-experience is by observing customer-experience. It is possible to conduct a survey asking customer what they would like, but this method where the customer uses the product and give their opinion provides a much better, real time, and real-life view on the outcomes of strategies. Ward (2013) suggests that user-experience is not just about designing products, but the strategic understanding of users and their behaviour. In this sense, usability methods are ideal in not only correcting problems found in products and services, but directly improving strategy delivery to enhance customer-experience. With UX, product and service design can be guided by targets, innovation can be improved, and users are represented (Ward 2013).

The model in figure 6.3 shows how certain user-experience targets reflect the types of strategies to be implemented for successful customer-centric outcomes. Incorporating these targets allows the strategies to be embedded in the products and services. Product design models such as v diagram, waterfall, etc. do not measure the strength of a strategy, but can be followed, implementing other customer-centric strategies, to correct usability problems through an iterative system.

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Though information systems strategies allow proper implementation of customer-centric business strategies, innovation strategies explain the extent by which usability targets embody customer-centric strategies of organisations. Kobie (2017) suggest that organisations be made aware that customer-centricity is an ongoing journey as opposed to a destination. The internal processes should be documented (Aula and Markova 2007), by so doing; they can be referred to in future, when it is necessary to measure strategy again (Oulanov 2008).

5.9 Summary

The user tests were conducted in two phases. The first phase aided in giving preciseness to the work. The second part of the tests involved the main usability study of users. The third research question was answered, showing how usability can be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience. It was found that:

- 1. There is a significant relationship within error tolerance, ease of use, effectiveness, and efficiency targets for measuring customer-experience outcomes.
- 2. There are no significant differences between user-experience and factors such as age, gender, technological expertise, and frequency of use of the products and services.
- 3. Customer-experience is measurable by usability targets in manufacturing and service companies
- 4. Customer-centric strategies is measurable by usability targets in manufacturing and service companies

The performance of customer-centric organisations has been proven by the regression analysis to result from the customer-centric activities as proposed in the model developed in this research. The better the customer-centric strategy, the better the business performance in terms of innovation and knowledge management. However, industry average results show that these results are not up to industry standards in terms of net profit. Two things have been proven. Customer-centricity does not guaranty beyond industry-average financial performance in terms of net profit, however, the strategic activities proposed in this research have been found to be the drivers of customer-centric organisations' financial results.

It was found that:

- 1. A significant relationship exists between high customer-experience with products and services of manufacturing and service companies, and the strategies identified in the research
- 2. Knowledge management improves customer-centricity, and leads to innovation in manufacturing and service companies

3. There is no significant relationship between customer-centricity and net profit in manufacturing and service companies, however there is a significant relationship between customer-centricity and gross profit

The third version of the model was developed in this chapter. This was based on user-experience targets set for the measurement of customer-centric strategies. These targets are relevant in any case of customer-centricity, irrespective of if the strategies were developed using the conceptual model developed in this research. The conceptual model developed is novel because it was developed based on data collected in this research, for measuring customer-centric strategies, an aspect that has not been researched. The next chapter covers the validation and testing of the framework developed.

Chapter 6: Framework Validation, Testing, and Implementation

6.1 Introduction

This chapter aims to answer research question 3, showing how usability methods can be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience. The chapter is divided into 3 main sections. First, it covers the process and results from the validation of the framework, based on the opinions of managers involved in the strategic management of manufacturing and service businesses. The criteria for selection of managers is identified and justified in the section. The purpose of the validation is to ensure the framework is relevant in both sectors. This was done using open-ended and closed-ended questionnaires, which are analysed in this chapter. The second section covers the testing process of the framework, which was done in 2 service companies and 1 manufacturing company in the UK. The trial results of the application of the framework are also discussed in this chapter. The last section of the chapter covers the final version of the framework, which is developed, and its application is discussed for pre-testing data collection, user testing data collection, and post-testing data collection.

6.2 Validating the Framework

The framework was validated using survey questionnaires to seek the opinions of strategy experts in the UK manufacturing and service industries, on the relevance and usability of the conceptual framework in both industries. The criteria for selection of the experts was based on:

- Full time employment of the individual in either a manufacturing or service organisation, because they have a better understanding of current customer-centric issues faced by businesses in the industry;
- Working in relevant department (Sales, Design, Customer relationship, IT, Marketing, Operations, Manufacturing, Human Resource, Quality), because these departments are directly involved in the execution of customer-centric strategies;
- 3. Management level- high and medium levels, because the development and implementation of business strategies are carried out at these levels ;
- 4. Individuals who did not participate in the survey data Collection, to obtain newer and broader perspectives on the applicability of the conceptual framework, and;
- 5. Having at least one year of experience in management of business strategies, because these individuals will be knowledgeable on the dynamism of the drivers of the business environment.

The sample size as determined using the G-Power software illustrated in appendix 20 was 32 respondents. This was based on a priori F-test analysis. The G-Power method as described in an article by Cohen (1992) is a popular and valid method for determining sample sizes. The method has over 28,000 citations. Other researchers (Faul et al. 2007; Faul et al. 2009; Mayr et al. 2007), also agree with the relevance of the G-power tool for determining sample sizes. The framework was validated using surveys distributed to the 32 experts.

6.2.1 Survey Development for the Framework Validation

The research seeks to produce a framework that meets the following criteria:

- 1. Is understandable by mangers that will use it;
- 2. Implementable by manufacturing and service businesses;
- 3. Be able to show benefit to managers in a relatively short period, in terms of improved userexperience,
- 4. Low cost, and;
- 5. Produces short term as well as long term results for customer-centric strategies.

Therefore, managers' opinion to this effect is necessary. Shadowing managers in application of the framework was an option for validation and testing. The method is used in data collection in social sciences by few researchers including McDonald (2005) in a research on actions in context in organisations. However, there was insufficient time to gain authorisation for this method of validation in this research. The use of a survey- which can be found in appendix 21- however was suitable because expert opinions were used to refine the framework. The feedback sheet had a rating of 1 to 5 for less feasible to highly feasible. To assess the conceptual framework in figure 5.58 in section 5.8, the survey was developed based on PRUB method (Driver 2016).

Using the method to ensure the questions included in the survey assessed relevant elements required in a measurement framework, the survey was grouped into Ease of use; Relevance; Customer-centricity; Strategic fit, and Outcome. The PRUB model (Driver 2016) was the basis in developing the survey questions which can be found in appendix 21, to ensure that the questions determine if the framework can aid in:

- 1. Defining a customer-centric strategic idea rigorously;
- 2. Expanding the customer-centric strategic idea into sub strategies;
- 3. Identifying the desired outcome, the strategy should lead to;
- 4. Justifying each sub strategy with evidence;
- 5. Identifying cause and effect evidence that shows the strategy will lead to the desired outcomes, and;

6. Assess the value of the strategy.

The framework was uploaded on British Online Survey (BOS), along with the method for application and user testing. These are improved on in this chapter after the analysis of the validation and trial results.

6.2.2 Conceptual Framework Validation Questionnaire Analysis Results

The goal of the analysis was to determine the degree of variance between responses from manufacturing and service companies, based on the usability and relevance of the model. As shown in Table 6.35 below, 44% of the questionnaires were completed by individuals working in the manufacturing industry, and 56% from the service industry. Table 6.35 also shows the distribution of respondents according to their years of experience working in a strategy position, the departments they work, and the levels of strategy they work in.

Sector	%
Manufacturing	44
Service	56
Department	%
Sales	21.9
Design	15.6
Customer Relationship	21.9
IT	21.9
Marketing	6.3
Operations	9.4
Manufacturing	3

Table 6.	35: Fre	quency	Table
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Years of Experience	%
1-3	37.5
4-6	28.1
6-10	25.0
More Than 10	9.4

Level of Strategy	%
High Level	39.0
Medium	61.0

Results from the nonparametric one-way ANOVA (degree of variance) tests showed no significant difference in responses with regards to sector, years of experience, department, and relationship with strategy, gender, and experience with other industries. Therefore, the opinions and conclusions on the model are applicable and relevant to both manufacturing and service companies, as validated. An opposite nonparametric result would have required changing certain areas of the model to accommodate both sectors. An implication might have been a conclusion that the model is relevant to only one sector. However, considering the high ratings of the model, and no significant difference, the model is therefore validated as easy to use, customer-centric, and applicable, considers strategic fit, and can help in providing relevant outcomes to both manufacturing and service organisations. There was, however, a significant difference with the knowledge of usability testing based on age. The post-hoc tests show that the younger respondents had higher mean scores for their knowledge of usability testing.

This however has no implications for the framework or the research, but could mean that usability is gaining more ground in practice. The framework helped managers to think about users' needs when designing.

With the level of strategy, there was significant difference with responses for the: applicability of framework for strategy measurement; validity of the framework within a knowledge-based framework; relevance of sub strategies in the framework; ability of the distribution of the framework to produce long term and short-term goals, and; ability of the framework to enable development of products that beat the market. Middle level managers had higher mean values. The implication of this therefore shows more relevance of the model in middle level management where strategy implementation is the focus. Table 6.36 below shows the raking of the respondents' knowledge on relevant areas to the framework.

Table 6.36: Assessing Knowledge of Respondents

	Rank
Knowledge of Information Systems	Medium
Knowledge of Strategic Management	High
Knowledge of Innovation	High
Knowledge of Knowledge Management	High
Knowledge of Usability	Low
Knowledge of Customer-centricity	Medium
Knowledge of Usability Testing	Low

The results in Table 6.36 show high knowledge of the experts in strategic management, innovation, and knowledge management, based on self-assessments. The table shows medium levels of knowledge with information systems and customer-centricity, and low levels with usability and usability testing. The implications of the results for this research are the increased need to explain the usability testing process, which is done in section 6.4.

Table 6.37 shows the results for the respondents' assessment of the ease of use of the framework. 75% of the respondents believed ease of use and applicability of the framework for strategy measurement is highly feasible. 87.5% were also of the opinion that the framework is easy to understand, and 75% found it feasible to easily implement the framework.

Table 6.37: Ease of Use of Framework

Ease of use	Feasibility (%)
The framework is easy to use for strategy measurement	75
Applicability of the framework for strategy measurement	75
The framework is easy to understand	87.5
The framework is easy to implement for strategy measurement	75
Likelihood of company using the framework	87.5

Based on their assessments, 87.5% of the respondents are willing to use the framework in assessing

their customer-centric strategies.

However, when asked which parts of the framework appeared disjointed or lacked cohesions, there were comments on difficulty in understanding the process of application, and the need for clarity on the relationship between aesthetics and pricing in this framework. The final version of the framework in section 6.4 addresses these problems by providing a detailed roadmap for application, and detailed explanation of each strategy and how they link to their respective targets.

With regards to the application of the framework in strategy measurement in Table 6.38, 75% of the respondents find the targets and stages in the framework to be relevant for strategy measurement. 87.5% believe the outcomes proposed in the framework are feasible. 75% believe that the framework is valid within a knowledge-based environment, and the metrics in the framework are relevant for strategy measurement.

Table 6.38: Relevance of Framework

Relevance of framework	Feasibility (%)
Targets in the framework are relevant for strategy measurement	75
Stages in the framework are relevant for strategy measurement	75
Outcomes proposed in the framework are feasible	87.5
The framework is valid within a knowledge-based environment	75
Metrics in the framework are relevant for strategy measurement	75

In the open-ended section for the application of the framework, the respondents were asked which elements not already in the framework they would add to fulfil core competencies in their organisations. Most of the respondents believed necessary elements are already imbedded in the framework. "The framework covers every area of customer-experience that it is supposed to. It shows the beginning of the relationship, to what is happening in the relationship, does it meet needs, and can we change that. It is like a hierarchy of where you are supposed to look. With value for money, that is necessary because all customers want that. Having engagement in the end is fabulous." Some suggestions for improvement however were related to human resources. For instance, one of the respondents commented: "Improving employees' performance management through effective Employment Performance Management System (PMS) should be reflected for strategic fit. Employees are key stakeholders and are very important. Therefore, evaluating their performance periodically and providing constant feedback will eventually lead to high performance culture and improve customers/clients experience". To improve on the model, a stage for employee performance management will be included and discussed in the strategic fit map in section 6.4. Table 6.39 contains the results of the assessment of the customer-centricity of the framework- how relevant the framework is to the customer-centric process. 87.5% of the respondents find the framework useful in developing and implementing customer-centric strategies. 75% of the respondents find the framework useful in assessing the value of customer-centric strategies and measuring the appropriateness of customer-centric strategies. 87.5% of the respondents believe the framework can be used to measure the outcomes of a customer-centric strategy.

Table 6.39: Customer-centricity of Framework

Customer-centricity	Feasibility (%)
The framework guides development of a customer-centric strategy	87.5
The framework guides implementation of a customer-centric strategy	87.5
The framework can be used to assess the value of a customer-centric strategy	75
The framework can be used to measure the appropriateness of a customer-centric	
strategy	75
The framework can be used to measure the outcomes of a customer-centric strategy	87.5

The respondents were asked which elements they would remove or alter to improve the customercentricity of the framework. Most of the respondents said they believed the elements are relevant. However, there were comments on how though pricing is linked to value; it was believed to be quite broad. There were suggestions that pricing be replaced with another strategy to represent value, mental effort, and cost effectiveness. To address this, service design and delivery and product development strategy will be added and explained in section 6.4, to add more clarity to the role of the pricing strategy. Table 6.42 shows how the framework addresses strategic fit. 75% find the substrategies relevant and properly linked. 87.5% suggest that the framework supports strategic fit and find it low cost for strategy measurement. 75% of the respondents believe the framework embraces risk and uncertainty.

Table 6.40: Strategic Fit

Strategic Fit	Feasibility (%)
Sub strategies in the framework are relevant	75
Sub strategies and outcomes are properly linked	75
The framework supports strategic fit	87.5
The framework embraces risk and uncertainty	75
The framework is low cost for strategy measurement	87.5

With regards the impact the framework could have of the outcomes of strategy, the respondents stated that the frame work can help determine if the outcome of the strategy is good enough to meet initial targets set and can help organisations compete with market in the industry. There were also comments on how the framework can help with the effective implementation of customer-centric strategies, leading to improved customer-experience in organisations. The last section of the survey was an assessment of the outcomes considered by the framework. 75% of the respondents suggest that the framework can produce short and long-term results. 87.5% find that the framework covers effective knowledge management. 75% of the respondents believe that the framework covers innovations and can help organisations go ahead of trend. They also find that the framework can help tap a true source of advantage and can enable the development of products and services that beat the market.

Table 6.41: Outcomes of using the framework

Outcomes of using the framework	Feasibility (%)
The framework can help produce short term and long-term results	75
The framework covers effective knowledge management	87.5
The framework covers innovation and going ahead of trends	75
The framework enables managers to tap a true source of advantage	75
Can enable the development of products that beats the market	75

Comments on their overall impression of the framework were required. According to the some of

the respondents:

- "The framework covers all areas required for an organisation to meet, satisfy customers • coupled with innovativeness which in turn meets the needs of customers from time to time. The framework enables the organisation compete on the highest level worth other organisations in the industry hence, high tendency of increase in market share".
- "Great! Apart from the fact that Human Resources was not factored into it. As you cannot • completely neglect the human input in any framework. Managing these human resources also forms a basis for a successful implementation of any framework"
- "There is a lot of information, understandably. However, an excel sheet could be used to transform it to a decision support system to also help with the processing of the user testing results."

To address this suggestion, an excel workbook will be used to develop a measurement framework to make the user testing process easier. Screenshots are included in this research and explained in section 6.4.2.

6.3 Testing the Conceptual Framework

After the validation process, the framework was tested in 3 organisations:

- 1. A high ranking higher education in the UK Midlands;
- 2. An international convenience supermarket in the UK Midlands, and;
- 3. A furniture manufacturing organisation in the UK Midlands.

The trial was conducted by reviewing strategies implemented with managers of these businesses and conducting user interviews to determine the relationship between their experiences and the outcomes achieved by the organisations. The criteria for selection of the originations included:

- 1. Should be a manufacturing or service organisation;
- 2. Should be willing to assess the outcomes and appropriateness of the strategies using the framework;
- 3. Should be within proximity for access due to time left on the research;
- 4. Should have 7 customers willing to participate in the testing process, and;
- 5. Should be willing to give access to their recent performance results.

The table below shows the demographics of individuals included in the process.

Sector	Participant	Years of experience/use	Role	Products		
	HE	4	HOD BAL			
	E1	2				
Education-	E2	2				
Service E3 2 E4 2 E5 2 E6 2	Guataman	Education				
	Customer	Education				
	-					
	E7	2				
	РС	12	Partner			
	C1	6				
	C2	-				
Convenience retail	C3	2		Groceries		
Service	C4	2	Customer	Grocenes		
	C5	3				
	C6	1				
	C7	6				
	OF	4	Owner			
	F1	1				
	F2	1				
Furniture	F3	1		Eurpituro		
Manufacturing	F4	3	Customer	Furniture		
	F5	2				
	F6	1				
	F7	1				

Table 6.42: Participants' demographics

Apart from helping to test the application of the framework, the process also helped in the collection of more data to improve and define the framework. These improvements are made in section 6.4.

6.3.1 Interview Process for the Trial of the Framework

The first step of the trial process was gaining permission from the owners or managers of the businesses. This was done in accordance with the ethics of the research. The summarised version of information given to the owners and managers is: The framework being tested is aimed at improving user-experience designs in manufacturing and service organisations. The framework has been developed to measure the appropriateness and outcomes of strategies to help improve customer-experience.

This is the final stage of the PhD research, and a trial of the framework is required to determine its suitability in an organisation. This trial involves a review of strategies implemented in the department to improve customers' experience and brainstorming to see if results would have been any different given targets in the framework.

Customers are to be interviewed to evaluate their experiences and assess how their experience relate to the targets set in the framework. Accepting the proposal would make the organisation one of 3 others included in the trial. The process requires:

- An interview with the owner/manager to gain insight and discuss strategies implemented in the organisation (1 hour)
- 2. 40-minuite individual interviews and observations with 7 customers who have been users of the products or services for at least one year because they have more experience of the organisation than the other customers. The interviews will help measure the applicability of the framework in the organisation's operations. It will also help determine if strategy results would have been different in the organisation, based on the framework developed. The user tasks can be found in table 4.2

The trial does not criticise strategies employed in the organisation. The goal is to test the applicability of the framework. The names of the participants and organisation will not be mentioned in the thesis. A sample of the informed consent form for the validation can be found in appendix 22, and the participant information sheet can be found in appendix 23. The interviews with the customers, managers, and business owners were guided by questions in appendix 26.

6.3.2 Trial Results

When given a scale to rate their experience with products and services, users tend to respond differently than when observed and interviewed. Therefore, user testing is appropriate in getting an actual representation of the products and services as it gives the opportunity to triangulate the results. With interviews, users can reflect on their experiences. With the observation, their negative and positive experience can be seen real-time. With the survey, they can attempt to give an objective evaluation based on their experiences. The higher institution however tends to provide a 'family environment', and despite having few areas that could be improved on, they provide a very good customer-experience. The customers had mostly positive words about their experience with the institution, and the observation verified this.

The results from the trial process for the organisations shows that the framework helps identify areas organisations can improve on to improve their customer-centricity. The trial also showed that in many cases, companies may believe they have provided certain level of experiences which may not be the actual representation to the customers. Furthermore, customers may seem loyal to these organisations; however as ascertained from the interviews, the fact is that in some cases, they are 'loyal' because of certain other restrictions and drivers. For instance, in the case of the international store, the customers find that they do not have many options or alternative stores to buy the products they require. This is because of the nature of the products being sold, which are limited for access by geographic factors. Therefore, they continue buying from this store despite the poor service design and experience. The implication therefore is that the store faces high risk of losing customers if competition increases. From the testing process, it was deduced that information plays an important role in experience with products and services, customer-experience also extends to services rendered by 3rd parties including suppliers, employee performance management is crucial to the success of customer-centricity, and back end operations are the foundation of customer-centricity. The framework aided in identifying and analysing these results, and the process proved its usefulness and cost effectiveness in measuring appropriateness of strategies. However, the use of the framework at this stage requires more investments in respect to time especially for analysis. The spreadsheet prepared in section 6.4. The trial results are presented in Table 6.43. The negative results are highlighted. The abbreviations used in the table are expanded below.

M=Management response

C= Customer response

HE= Higher Education

FM= Furniture Manufacturing

IFCM= International Foods Convenience Supermarket

P= Positive

N= Negative

Table 6.43: Trial Results

					Re	sults		
		CCS strategy	I	HE		М	IF	СМ
			М	С	М	С	М	С
nted	Maintaining good relationship with customers on all levels of interaction with staff and management	CRM	Р	Р	Р	Р	Р	N
pleme	Ensuring good relationship between management and staff for motivation to have good relationship with customers	Operations	Р	Р	Р	Р	Р	Р
egy im	Providing positive experience from first contact with customers because first impressions matter	Aesthetics	Р	Р	Р	Р	Р	N
trat	Ensuring customers have access to all necessary information	IT	Р	N	Р	Р	Р	N
S	Structuring the experience to enable customers to easily adapt	Product development	Р	Р	Р	Р	Р	N
	Regular contact to ensure the welfare of customers	CRM	Р	Р	N	N	Р	N
	Activities to make customers transition to new levels (and other products) smoother	Product development and Service design and delivery	Р	Р	Р	N	Р	N
	Planning and supporting all areas of the customers' needs (product-direct and indirect)	СКМ	Р	N	N	N	Р	Ν
	Employing staff with interpersonal and empathic skill as good as their qualifications	СКМ	Р	Р	N	Р	Р	N
	Providing a family atmosphere	CRM	Р	Р	N	N	Р	N
	Providing numerous avenues to encourage interaction with the organisation	Distribution	Р	Р	N	N	Р	N
	After sales care	Service design and delivery	N	Р	Р	Р	Р	Ν
	Agents and marketing to recruit customers	Marketing	Р	Р	Р	N	Р	N
	Understanding the needs and diversity of customers	СКМ	Р	Р	Р	N	Р	Р
	Integration of units through communication on which flow of information is dependent	IT	Р	Р	N	N	Р	N
	Training staff to ensure customer-experience is maintained	СКМ	Р	N/A	N	N/A	Р	N
	Setting policies that help improve customer-experience	Operations	Р	Р	N	Р	Р	N
	Identifies as customer facing	Service design and delivery	Р	Р	Р	Р	Р	N
	Expansion strategies	Operations	Р	Р	Р	Р	Р	N/A
	Communicative to customers	IT	Ν	Р	Р	N	Р	N
	Prescriptive customer-experience strategies	Operations	Ν	N/A	N	N/A	Р	N/A
	Emergent customer-experience strategies	Operations	Р	N/A	Р	N/A	Р	N/A
	Proactive	Operations	Ν	Р	Р	N	Р	N

	Reactive	Operations	Р	Р	Р	Р	Р	N
	Regular review of strategies (annual/bi annual)	Operations	N	N/A	N	N/A	Р	N/A
	Use of IT	IT	Р	Р	Р	Р	Р	Р
	Supported IT platforms and speedy support	IT	Р	Р	N	N	Р	N
	Fully functional IT systems	IT	Р	N	Ν	N	Р	N
	Customer orientation	СКМ	Р	Р	Р	N	Р	N
	Adapting to customer changes and market needs	СКМ	Р	Р	Ν	N	Р	N
	Unique methods of delivery	Innovation	Р	Р	Р	N	Р	N
	Survey for feedback	CRM	Р	Р	Ν	N	Р	N
	Value for money	Pricing	Р	Р	Р	N	Р	Р
	Customer access to management	Service design and delivery	Р	Р	Р	Р	Р	N
	Need for more indirect services outside the major ones provided	СКМ		N		Р		Р
	After sales care	CRM	Р		Р		N	
	Communication and information not always ready	СКМ	N		Р		Р	
	Consciousness in customer-centric strategy development and implementation	CCS		N	N		N	
b0	Lacks customer-experience department	СКМ		N	N		N	
king	Regular review of strategies	CCS		N		N		N
s lac	Multiple systems and unit technical conflict	IT		N		N		N
reas	Technical issues- rigid and complicated IT	IT		N		N		N
er A	Innovation	Innovation	Р			N		N
)th€	Delivery	Design and delivery	Р			Р		N
0	Accessibility	Distribution		Р		N		N
	Value	Pricing		Р		N		N
	Interaction	Design and delivery		Р		N		Р
	Knowledge management	СКМ		Р		N		N
	Engagement	CRM		Р		N		N

from	% of customers feel like they belong	CCS	95%	72%	77 %
Results	% retained (loyal)	CCS	98%	88%	76%

Education Sector Results

The results for the higher institution in Table 6.44 show a high overall customer-experience. This high performance in the outcomes and appropriateness of their customer-centric strategies is as a result of their highly efficient, effective, and easy to use services. They however had an overall medium error tolerance as a result of lower IT and customer knowledge management results, and medium operations results. The problems found with their IT systems include: access to all necessary information; communication within the organisation and to customers; poorly functional IT systems, and the conflict between multiple systems and units. These can be solved by using a system that updates student information in real time as illustrated in Figure 6.38. With such system, when updates are made in any department or unit, they can be updated and accessed in real time by the relevant users. The security measures implemented could ensure certain levels of staff have access to certain information, thereby protecting customers' privacy.

The portal dashboard can be designed to be smarter for easier use and fewer errors. The problems found with the operations strategies were due to the lack of proactivity, a well-developed knowledge of customers' indirect service related needs, and lack of a customer-experience department. A solution could be to have staff in the admin separately handle and manage the daily academic and non-academic experience of customers. This department could have bi-weekly focus groups with students to discuss societies and social needs, and academic needs as well. The department would also predict certain customer requirements, and implement them before they are needed. These can be reviewed regularly to ensure they are the right fit for the customers, staff, and brand of the organisation. The wider customer-centric problem is the lack of consciously developed of customer-centric strategies and their implementation. The University identifies as customer facing. It is therefore necessary to make more conscious efforts in developing customer-centric strategies. This will greatly improve the IT, CKM, and error tolerances lapses in the organisation.

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Table 6.44: Higher Education Framework Trial

Customar experience	Customar experience												
Requirements	Target	(User 1 to 7)							Related Strategy				
Requirements	Turget	1	2	3		4	5	6	7	AVG			
1. Access to support	✓ Reachable✓ Operational/Functional	1	2	2		2	3	1	2	1.8	L		Information Technology
2. Response from support	 ✓ Speedy response ✓ Helpful Communication ✓ Reliable 	2	1	2		2	2	2	1	1.7	L		Customer Knowledge Management
3. Reduced need for additional support	✓ Design✓ Feature	2	2	2		3	3	3	3	2.5	М		Operations
4. Product/Service Speed	✓ Interactive✓ Fast	3	3	3		3	3	3	3	3	Н		Product Development
5. Performance/delivery	✓ Interactive✓ Functional	3	3	3		3	3	3	3	3	Н		Service Design and Delivery
6. Ease of learning	✓ Features✓ Design	3	3	3		3	3	3	3	3	Н		Aesthetics
7. Satisfying	✓ Meets expectations✓ Brand and design	3	3	3 3	3	3	3	3	3	3	Н		Aesthetics
8. Uniqueness	✓ Differentiation	3	3	3 3	3	3	3	3	3	3	Н		Innovation

		✓ Functional										
9. Value		 ✓ Mental effort ✓ Cost effective ✓ Value for money 	3	3	3	3	3	3	3	3	Н	Pricing
10. Lack Re	of errors liability	✓ Reliable✓ Functional	3	3	3	3	3	3	3	3	Н	Operations Marketing
11. Product/Service Accessibility		✓ Variety✓ Platforms✓ Channels	3	3	3	3	3	3	3	3	Н	Distribution
12. Er	ngaging	 ✓ Interesting ✓ Reuse ✓ Recommend 	3	3	3	3	3	3	3	3	H Customer Relationship Management	
Usability goals:	Error tolerant	Efficient				Effe	ctive				Easy to use	

	Information System	s Value Chain	
	Knowledge Manage	ment Systems	
	Information System	ns Activities	
Create Knowledge	Store	Share	Use
Focus groups	Knowledge database	Portals	Decision support
Data mining	Document management system	Emails	Strategy development
Customer-experience department			Strategy implementation
Knowledge network and discovery			Strategy execution
	Management and Orga	nization Activities	
Organisation practices and policies	Organisation culture	Staff Training	New IT processes
			New products and services
			Improved IT processes
	Create Knowledge Focus groups Data mining Customer-experience department Knowledge network and discovery Organisation practices and policies	Information System Knowledge Manager Information System Information System Information System Store Store Focus groups Data mining Data mining Customer-experience department Knowledge network and discovery Management and Organ Organisation practices and policies	Information Systems Value Chain Knowledge Management Systems Information Systems Activities Create Knowledge Store Share Focus groups Knowledge database Portals Data mining Document management system Emails Customer-experience department Document management system Emails Knowledge network and discovery Management and Organization Activities Organisation practices and policies Organisation culture Staff Training

Figure 6.38: Solution for the Higher Education Customer-experience Problems and Furniture Business

Furniture Manufacturing Results

Table 6.45: Furniture Manufacturing Framework Trial

Customer experience	User Ranking																								
Customer-experience Requirements	Customer-experience Target						(Us	ser 1 to	o 7)			Related Strategy													
Requirements		1	2	3	4	5	5	6	7	AVG															
1 Access to support	✓ Reachable	2	2	2	2		1	2	2	2.2	M	Information													
1. Access to support	✓ Operational/Functional			2			-	-		-	۷	5	2.2	101	Technology										
	✓ Speedy response											Customer													
2. Response from support	✓ Helpful Communication	3	2	2	2	2	2	2	1	2	M	Knowledge													
	🗸 Reliable											Management													
3. Reduced need for additional	✓ Design	2	2	2	2		2	3	2	3	Ц	Operations													
support	✓ Feature		5	5		-	5	J		5		Operations													
A Product/Service Speed	✓ Interactive	2	2	2	2		2	3	2	3	Ц	Product													
4. Troduct/scivice specu	✓ Fast	J	J	J	J			J	J	5		Development													
5 Performance/delivery	✓ Interactive	2	2	2	2		2 2 2	2 2 2		2 2	3 3	2 2 5 7		2 2 57		3 2 5 7		3	2	3 2 57		3 7 5	2 57	н	Service Design
3. Terrormance, actively	✓ Functional	2	2	2	J			5		2.57		and Delivery													
6 Fase of learning	✓ Features	R	2	2	2		2	z	2	3	Ц	Aesthetics													
o. Lase of learning	✓ Design	5		5	J		5	J	,	5		Aesthetics													
7. Satisfying	✓ Meets expectations		3	3	3	3	3	2	2	2	н	Aesthetics													
71 Satisfying	✓ Brand and design						5	5		5															
8. Uniqueness		✓ Differentiation✓ Functional	2	3	2	3	3	3	2	2.57	Н	Innovation													
-----------------------------------	----------------	--	---	---	-------------	---	---	---	---	------	---	-------------------------------------													
9. Value		 ✓ Mental effort ✓ Cost effective ✓ Value for money 		3	2	3	3	3	3	2.57	н	Pricing													
10. Lack of errors Reliability		✓ Reliable✓ Functional		3	2	2	3	3	3	2.7	Н	Operations Marketing													
11. Product/Service Accessibility		✓ Variety✓ Platforms✓ Channels	2	2	2	2	3	2	2	2.14	М	Distribution													
12. Engaging		 ✓ Interesting ✓ Reuse ✓ Recommend 		2	2	2	2	2	3	2.1	М	Customer Relationship Management													
Usability goals:	Error tolerant	Efficient Effective Easy to			Easy to use																				

The results in Table 6.45 show an overall high customer-experience for the furniture manufacturing business. This performance results from the high error tolerance, ease of use, and effectiveness of their products and services. Efficiency however was medium, dues to average results in IT, CKM, CRM, and Distribution strategies. The specific problem included: poorly functioning website, delays lack of interesting products and services, slow response when contacted, and a seeming confusion when a new staff handles the problem thread. The solution to this is to improve the knowledge sharing system. This will involve updating the website, updating contact details on the website, including more platforms for support such as instant messaging, and maintaining customer information files. Similar to the education institution, it is necessary to proactively and consciously develop customer-centric strategies.

Retail Store Results

The overall customer-experience for the retail store shown in Table 6.46 is low. This result from poor error tolerance and ease of use, and average efficiency and effectiveness of the products and services rendered. As there is no high performing strategy, suggested solutions in section 6.4.3 are applicable.

Table 6.46: Convenience store Framework Trial

	Customer-experience		User Ranking								
Customer-experience Requirements	Target	(User 1 to 7)									Related Strategy
			2	3	4	5	6	7	AVG		
1 Access to support	✓ Reachable	1	2	1	2	2	1	1	15	1	Information
1. Access to support	 ✓ Operational/Functional 	L L	5	1	2	2	T		1.5	L	Technology
	✓ Speedy response										Customer
2 Besnense from support	🗸 Helpful	1	1	1	1	2	2	2	1.4	L	Knowledge
2. Response from support	Communication	L	1			2	Z				Knowledge
	✓ Reliable										Management
3. Reduced need for additional	✓ Design	2					2		1.8	L	
support	✓ Feature		Z	L	Z	Z	2				Operations
A Product/Sorvice Speed	✓ Interactive	1	2	2	1	2	2	2	2 1	NA	Product
4. Producty Service Speed	✓ Fast		5	5	1	5	Z		2.1	IVI	Development
E Derformence (delivery	✓ Interactive	1	1	_	2	1	1	2	1 5		Service Design
5. Performance/delivery	✓ Functional	L	L	2	2	L	T	5	1.5		and Delivery
6 Ease of learning	✓ Features	2	2	2	3	2	3	2	2.8	н	Aesthetics
0. Ease of learning	✓ Design	3	2	5	5	5	3	5	2.0		Aesthetics
7 Satisfying	✓ Meets expectations	2	1	2	2	2	1	1	15		Aesthetics
7. Sausiying	✓ Brand and design	2	L			2	T		1.5	L	Aesthetics

8. Uniqueness		✓ Differentiation✓ Functional	2	1	1	2	2	3	3	2.0	М	Innovation
9. Value		 ✓ Mental effort ✓ Cost effective ✓ Value for money 	1	2	2	3	3	3	3	2.4	М	Pricing
10. Lack of errors Reliability		✓ Reliable✓ Functional	2	1	2	2	1	2	3	1.8	L	Operations Marketing
11. Product/Service Accessibility		✓ Variety✓ Platforms✓ Channels	2	2	2	2	2	2	2	2.0	М	Distribution
12. Engaging		 ✓ Interesting ✓ Reuse ✓ Recommend 	2 1 1 1 2 2 3 1.7		1.7	L	Customer Relationship Management					
Usability goals:	lity Error tolerant Efficient			Effective							Easy to use	

6.3.3 Feedback from Trial Process

During the interviews with managers for the trial process, feedback was given for the appropriateness and relevance of the framework. The results from the trial of the framework were also discussed with the managers of the three organisations, who identified areas they were both aware and unaware that their businesses were lacking. The managers also acknowledged areas of customer experience they had previously not understood or defined. The business managers found the framework useful in identifying areas of customer concern, but primarily identifying design flaws in their products and services. Managers found that the framework covered every area of customer experience that it is supposed to, and helped to think about areas that may have originally been overlooked especially with the access and response from support.

The managers found that the framework helped them to recognise the "beginning of the relationship, to what is happening in the relationship, does it meet needs, and can we change that. It shows the IT is like a hierarchy of where you are supposed to look... with value for money, that is necessary because all customers want that. Having engagement in the end is fabulous." The managers found that the framework aids in recognising and actively thinking about skills and IT expertise users have that could hinder or improve their experiences with the products and services. The managers acknowledged that the framework enables them to proactively consider the nature of support they could provide before, during, and after the use of the products.

Managers find that the framework got them thinking about tailored experiences, and characteristics of customers especially from their international experiences and cultural mappings for various countries that could hinder or improve the success of a locally designed product or service. The managers noted that actively thinking about these experiences and differences would enable them to be proactive to providing adequate support to the diverse users of their products and services, especially in terms of technology. The managers were satisfied with the extent to which the framework allowed them to assess their current customer-centric systems and find areas they were lacking, and were of the opinion that there were gaps that they needed to fill to provide optimum customer experience especially for their international users.

The managers also found that the framework helped them gain insight to their customer and user behaviour, and even apply dormant knowledge that had been previously acquired in developing solutions to their customer experience problems.

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For instance, with the University, it was remembered or realised that students make use of services provided only at the dying minute before it is needed, and even though staff are knowledgeable to meting their need, it tends to create delays or incomplete support in some areas due to the volume of requests so close to a deadline. The managers also realised how an increase in customer-base requires adjustments in the nature and ratio of resources used to provide support to users. They were happy that the framework and user tests aided in identifying these problems more specifically. In terms of speed, managers realised that the provision of more product offerings helps in meeting the increasing market needs. They also found that there is the need to modify or remove some products and services that no longer provide optimum results for the business.

The framework helped managers relatively assess the performance of their resources, the uniqueness of these resources, and how they share and contribute to the delivery of the organisation's values. The results helped provide a relative comparison of the delivery of products and services to those of their competitors, and how their performance can be improved to address the diverse needs of their diverse demographic groups. They also found that their customers are much less patient than was assumed to read instructions, terms and conditions, and many forms of support provided, and they found that this largely affects the ease of learning of products and services by the customers.

The framework enabled the managers assess their current methods of assessing satisfaction provided by products and services. For the most, they found that their methods were mostly effective for the purpose, but were of the opinion that the user tests and the framework were more extensive for this purpose. They found that the framework enabled them assess areas they would previously overlook, or identify areas they would normally not think of. They were of the opinion that the framework would enable them to be proactive than reactive to the needs of their customers. The managers found that the framework made them more conscious of the importance of value to the customers. A very important area of operations that managers found to contribute to poor performance is the reliability of external systems, which contribute to unreliability and provision of errors with their products and services. The managers especially for the supply of information and resources. They found that this dependence usually makes their systems complex, and especially affects communication with customers, largely affecting their experiences.

The managers realised how their strategy development process has been reactive, and they realised how this negatively affected their customers' interaction with their business.

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They found that a lot of this had to do with their dependence on certain levels of suppliers, and they acknowledge the need for better and more appropriate strategies to tackle these, especially for the design of services. Lastly, some managers also acknowledged the positive areas of their operations that improved their customer-centricity. For instance, one of the businesses found how important customer engagement is to their experience, and they realised how their current strategies helped in improving this. This has to do with the relationship built with staff, the nature of training provided, 'no wall' strategy between subordinates and managers, and management engagement.

6.4 Implementing the Conceptual Framework

A customer-centric organisation is one with the goal of providing positive customer/client experience at all points of interaction with their customers/clients: before sales; during sales, and; after sales, using digital and non-digital means. Therefore, a customer-centric strategy is a plan or series of plans developed and implemented with the goal of providing positive customer/client experience with products and services designed to improve innovation through knowledge management. These strategies that make up a customer-centric system identified in Figure 6.39 below, are necessary strategies included in the framework, found in this research to be relevant in ensuring positive customer-experience. These strategies are colour coded to show their relationship with usability goals of efficiency, effectiveness, ease of use, and error tolerance.



Figure 6.39: Customer-centric strategies

The appropriate development and implementation of these strategies leads to successful customer-centric outcomes. The following sections provide a guide for the development, implementation, and measurement of these strategies to ensure they are appropriate and yield successful outcomes of positive customer-experience. The use of the framework is divided into 5 categories based on the waterfall model for systems design. These categories are illustrated in the figure 5.40 below.



Figure 6.40: Waterfall Model for Framework Implementation

6.4.1 Stage 1: Requirements Definition and Pre-Testing Data Collection Activities

In this stage, the SMART product development and service design goals are to be identified, and strategies developed and documented to this effect. Possible strengths, weaknesses, opportunities, and threats are to be identified and their priority and impact are to be assessed. It is necessary to revisit the purpose of the business and the existing strategies. This is a necessary step for any business that:

- a. Decides to adopt customer-centricity;
- b. Identifies the need to improve their existing customer-centric strategies;
- c. Identifies the need for improvements in the execution of their customer-centric strategies.

In these cases, the framework developed in this research can serve as a guide for achieving the goals. The pre-testing activities involve the design of information systems, and the development customer-centric strategies.

Definitions of Customer-centric Strategies

The Table 6.47 below provides definitions for the essential strategies required for customercentricity to improve product development and service design in manufacturing and service companies Table 6.47: Definitions of strategies

Strategy	Definition
Information Systems strategy	A plan allowing the implementation of underlying software, hardware and networks that support business operations for improved customer- experience with products and services.
Customer Knowledge Management	A plan for the inclusion of staff, processes, and technology in creating, using, sharing, storing, learning, and reusing knowledge to provide speedy, reliable, and helpful interaction between customers and products and services.
Operations strategy	The reliability and functionality of an organisation's workforce skills and capacity, and managerial competence to provide enhanced customer- experience with their products and services.
Product and service development strategy	Co-production with customers to create or improve interaction and speedy response of products and services, leading to improved customer-experience.
Product and service delivery strategy	An activity or set of co-design activities adopted by an organisation to provide interactive and functional services for improved customer- experience.
Aesthetics or industrial strategy	A plan adopted by an organisation to produce or deliver products and services with innovative features and designs that meet customer expectations by appealing to users.
Innovation strategy	The development of uniquely functional products and services that have a positive impact on customer-experience in manufacturing and service companies.
Pricing strategy	A plan developed for implementation by an organisation that reflects the value of a product or service based on cost effectiveness and monetary expenses made by the customer.
Marketing strategy	A plan implemented by an organisation to promote reliable and functional products and services that reflect the brand and interactions with the customer-centric organisation.
Distribution strategy	A coordinated set of activities implemented by an organisation enabling product or service accessibility through a variety of channels and platforms, providing options for customers, enhancing customer- experience with the organisation.
CRM strategy	A plan implemented by an organisation to foster a positive relationship with their customers, based on the provision of engaging products and services, and operations that encourage their customers to reuse and recommend their products and services.

Customer-Centric Strategy Development

When the organisation decides to either start being customer-centric or improves customercentricity, it is necessary to understand the nature of the business environment. This basic but important process of strategy development is crucial, as it plays a major role in the outcome of the strategies. As shown in the Table 6.48 below, the strategic management cycle begins with the strategy development process which has widely been researched. The process involves an analysis of the external macro and micro environment, of which the PEST and Porter's 5 forces frameworks are both feasible and appropriate in incorporating customer-experience targets in the development of strategies as discussed in section 5.7. PEST is feasible in analysing macro environmental drivers to ensure the development and design of satisfying, easy to learn, and valuable products and services. The Porter's five forces framework is feasible in the analysis of micro environmental drivers that affect the development and design of products and services that are accessible, satisfying, and unique.

Driver	Customer-experience			
Political	The regulations that influence/impact/hinder/limit the efficient delivery of customer-centric products and services.			
Economic The economic drivers that influence/impact/hinder/limit the educed delivery of customer-centric products and services.				
Socio-culturalCultural and religious beliefs, demography, population, per constructs that guide the behaviours of customers, who (as opp to the economists' belief) are not rational.				
Technological	How customer-experience can be improved with the technological advancements and innovations.			
Bargaining power of suppliers	Ensuring that back end supply or support shares the same customer- centric values at reasonable cost			
Threat of new entrants	Being proactive and customer orientated to avoid the risk of losing			
Competition	loyal customer to better orientated start-up/substitute/competing			
Substitute products	businesses			
Customer bargaining power	Ensuring there is a uniqueness that would guarantee high switch cost to loyal customers			

Table 6.48: PEST and Porter's 5 Forces

The internal analysis using the value chain model and cost benefit analysis shown in Table 6.49 will allow the organisation identify resources and competencies that will enable them gain strategic fit by tracking the information supply chain and improving all areas of customer interaction with the organisation. The value chain is relevant in the analysis of internal business drivers that contribute to the development and design of products and services that are efficient, effective, error tolerant, and easy to use. The cost benefit analysis aids in ensuring the products and services are unique, valuable, satisfying, and reliable as identified in section 5.7.

Table 6.49: Value chain

Value chain	CX strategies	
Primary activities	Operations	of
Inbound logistics	Product development	nre
Operations	Service design and delivery	eas
Outbound logistics	II Distribution	3
Marketing and sales	Marketing	ative
Services		= rela valu
Secondary activities	IT	ost
Firm infrastructure	Pricing	/ c
Human resources	СКМ	efit
Procurement	CRM	Ben
	Innovation	
Technology	Aesthetics	

The use of Porter's Generic model or bowman's clock will enable the organisation to develop customer-centric strategies in the areas identified in this research as shown in the Table 6.50 below. The porter's generic model and the Bowman's clock aid in the development of strategies that are accessible, valuable, and unique.

Table 6.50: Porter's generic

Generic strategy	Scope- Accessible products and services	Differentiation- products and services	Unique	Cost- products services	Valuable and
Customer-centric	IS	IS		IS	
strategies	Distribution	Innovation		Pricing	

The Ansoff model in Table 6.51 aids in determining strategic actions, and can help organisations identify areas that provide better opportunities for customer-centricity. The model is relevant in making strategic choices to ensure products and servcies are accessible, fast, valuable and uniqe as referred to in section 5.7. It can help busineses in choosing distribution, pricing, product development, service delivery, and innovation strategies.

Table 6.51: Ansoff

	Existing product	New product				
Existing market	Market Penetration	Product development				
	Same product in same market with	A new product based on				
	improvements to customer-	knowledge of customer-				
	experience	experience in the same markets				
New market	Market development	Diversification				
	Same product in new market	A new product in a new market				
	requiring acquisition of new	where customer-experience has				
	customer knowledge or	not been tested, thus requiring				
	orientation.	new journey mapping				

When the strategy has been developed, it can be implemented based on the balanced scorecard in Table 6.52. The framework aids in the implementation of strategies to ensure products and services are satisfying, fast, effective, and error tolerant as described in section 5.7.

Table 6.52: Balanced scorecard

Balanced Scorecard Perspectives	Customer-centric Areas
Financial	Pricing
Customer	Marketing
	СКМ
Internal process	IS
	Operations
	Aesthetics
Learning and growth	Product development
	Service design and delivery
	Innovation

6.4.2 Stage 2: Information System Design

The second stage involves the design and architecture of the information and knowledge management systems. The design process is to be based on the project documentation, and it defines the software and hardware requirements for customer-centricity. This will aid in highlighting what areas of the business are to be tested with the framework, possible problem areas, and how the parts will be integrated. The goal behind the design should be the development or improvement of innovative processes to aid in predicting customer needs, improving technology, and that require investment in R&D. It is important that the improved technology should help in the creation and use of customer knowledge.

The design needs to recognise the organisational structure, as improving customer-experience greatly relies on the flow of information within and outside the organisations. It is for this reason that the information systems strategies implemented by an organisation are the bedrock of their interaction with customers and execution of other customer-centric strategies. Having noted this, the interactions with customers should be integrated to the information system, to ensure there is a functional information supply chain. Table 6.53 shows the relationship between management levels and the organisations structure, and the types of interaction with customer-experience pillars are also introduced, to illustrate the customer-experience function of each stage of interaction.

Management level		Information supply chain	Interaction with customers	Stages of interaction	KPMG CX Pillar	
				Brand		Personalization
do	ategic	Strategy	Behind the	Values	Presale	
	Str	Development	scenes			Integrity
				Leadership		
a)	_	Measurement		Management		Expectations
ddle	tica	measurement	Back stage	interaction	Acquisition	
Mie	Tac	Implementation		External agents		Pecolution
		Implementation		(suppliers)		Resolution
				Face to face		
	_					Time and effort
	ů	Stratogic	Eront stago	Digital experience	Use	
Γον	rati		FIOIL Stage	Digital experience		
	be	LACCULION			Aftersales	Empathy
				Interface		Empathy
				interaction		

Table 6.53: Organizations structure and information supply chain

KPMG- one of the big 5 accounting firms, has spent the past 8 years in this field of ongoing research, with the aim of turning global customer-experience best practice into effective business results. This has been based on 6 pillars on which they find that customer-experience meets.

This research showed how these pillars originate from the research of usability and userexperience. Table 6.53 above suggests what stages of interaction with the organisation have the responsibility of achieving each of the pillars shown in Figure 6.41.



Figure 6.41: KPMG Pillars

The research and improvement of customer-experience is behavioural, and even though the measurement process has been made objective, a lot of consideration needs to be placed on the subjective and emotional effect of the interaction on the customer, which basically has to do with the way the organisation, through their products and services, makes customers feel. Therefore, even though an organisation, such as the higher institution in which the framework was tried (section 6.3.2), does not have a structured customer-centric strategic plan, their ability to drive an emotional connection with their customer improved their customer-centricity There needs to be an understanding of the information structure, and requirements or expectations for customer-centricity. These requirements form part of the conceptual framework, and are defined in the next section.

Definitions of the Framework Targets

Definitions for the customer-experience requirements for customer-centricity are provided below in Table 6.54 below.

Target	Definition
1. Access to support	Users require accessible support, and it defines their experiences because often time users find themselves requiring help to make use of products and services. If support, in whatever form (user manual, contact number or email, live chat, in person, FAQ and help sections, etc.) can be reached, and works without complications or adds to the users' frustration, then the IT strategies are appropriate and successful. This is because in improving customer-experience, Information systems play the role of applying information technology in supporting business strategies. It is an 'error tolerance' function because it measures the suitability of risk management plans for the use of products and services provided by an organisation.

Table 6.54: Definitions of customer-experience requirements

2. Response from support	Response from support is characterized by how fast users can get the help they need from the sources of support made available to them for the use of products and services. It further includes how helpful the support is in meeting their needs, and how reliable users find these sources of support to be. This relies on customer knowledge management in the sense that customer orientation allows organisations to understand the constituents of positive experience over time as to what users find helpful, fast, and reliable. Just as with 'access to support', it is an error tolerance function because it measures the pro-activeness of organisations in managing possible errors that could be faced in the use of their products and services.
3. Reduced need for additional support	The reduced need for additional support when using products or services improves customers' experiences through improved product development and service design. This could either be for a first-time user or a frequent user. The reduced need for additional support is characterised by the provision of all relevant information and requirements that allows users know how to find their way around the product or service designed. This is largely design-based, as a smart design is forward thinking, thereby perceiving problem areas and providing design solutions beforehand. This error-based target is therefore an operations strategy in both manufacturing and operations companies.
4. Product/Service Speed	Product speed refers to how fast a product or service is to respond to the need of its users. It is an efficiency goal that can be achieved by implementing appropriate product development and service design strategies, through user testing for co-development to understand the behaviour, thinking process and experience of users.
5. Performance/ delivery	Quality of performance and delivery refers to how interactive a product or service is. In the context of user-experience, this is based on the ability of the product or service to reliably respond to the users' needs. It is an error tolerance goal that can be achieved by implementing appropriate product development, and service design and delivery strategies.
6. Ease of learning	Customers expect to not face difficulties when making use of a product for the first time or at least the first few times of use. A product or service is easy to learn when it is characterised by simple features. The product/service is effective when the appropriate aesthetics strategy to enhance the ease of learning is applied.
7. Satisfying	A product or service is satisfying when users find that it has met their expectations. This 'ease of use' goal is largely attributable to the success of the aesthetics strategies implemented by the company.
8. Uniqueness	A product or service is unique when it is significantly different from other products or services in one or more areas. It is an 'ease of use' goal because innovation strategies not only aid in providing new products or processes, but also in reducing the level of stress and frustration associated with the use of the product or service.
9. Value	Value is significantly important in providing positive customer-experience. Customers largely care about how much mental and financial resources they spend using a product or service. Value then refers to the worth of the product or service in relation to the amount of money, time, and mental resources being spent on its acquisition and use. Therefore, it is measured by the value for money, cost effectiveness and mental effort exerted on the use of a product or service. Value as a requirement for effectiveness can be achieved by implementing the appropriate pricing strategies, product development, and service design and delivery strategies.

10. Lack of errors	A product or service lacks errors when users find minimal to no faults in its use. The product is not only functional but reliable in meeting the needs of the uses. This is a requirement for effectiveness. To achieve high functionality, the manufacturing and operations strategies need to be appropriate, and to ensure reliability the marketing strategies need to be appropriate and not misleading to the customers.
11. Product/Service Accessibility	The accessibility of a product or service contributes to the experience associated with its use. Accessibility is defined by the number of platforms available for customers to acquire a product or service, and the availability of a variety of products and services to meet the different needs of different users and their different characteristics. This requirement tends towards efficiency and depends on the success of sales and distribution strategies implemented by organisations.
12. Engaging	A product or service is engaging when it captures the interest of users enough for them to reuse it and recommend it to other individuals. This contributes to the ease of use of a product or service and benefits from successful implementation of CRM strategies.

PACT Analysis and Task Development for User Testing

Before the user-test data is collected, a PACT analysis is required- an example of which can be seen in appendix 5. The PACT analysis is necessary to identify the tasks and areas for testing customer-experience. From the PACT analysis, 5-10 random and specific tasks can be developed, taking into consideration each of the PACT components identified in Table 6.55.

	,						
	People		Activities		Context		Technologies
1.	Age	1.	Temporal	1.	Physical context	1.	Input
2.	Gender	2.	Cooperative	2.	Social context	2.	Output
3.	Psychological	3.	Security	3.	Organisational	3.	communication
	requirements		conscious		context		
4.	Learning capacities	4.	Data	4.	Circumstances		
5.	Education		requirements	5.	Support required		
6.	Language						
7.	Culture						
8.	Frequency of use						
9.	Disabilities						
10.	Discretionary or						
	committed						

Table 6.55: PACT Analysis

6.4.3 Stage 3: Implementation and Strategy Measurement

The third stage involves the assessment of the appropriateness of the strategy or the outcomes. The appropriateness should be measured, recognising the business objectives and cultures. The strategy should also be simple, and consider the availability of the resources required for execution, to give the company competitive advantage and strategic fit. It is important to ensure a cost benefit balance as well. The success factors however are based on the UX targets. The framework can be used to test strategies independently, or the usability goals. When the PACT analysis is completed, the tasks should be developed, and at least 7 participants matching the specifications of "people" in the analysis need to be recruited to each carry out the 10 tasks while being observed.

Each interviewed-observation should last no more than 50 minutes. Therefore, if while carrying out the activities, the participants are unable to complete a task within 5 minutes, the task is to be abandoned and given a low raking in all the targets of the framework. The framework is to be completed for each user test, taking into consideration behaviours, facial expressions, and comments of the users to give an L/M/H on the framework. This is to be represented by 1 for low, 2 for medium, 3 for high, of which the average of tasks for all users is to be computed for each target. The colour charts chow the relating requirements, targets, strategies, and goals. When the measurement process is completed, it may be found that they have performed poorly (1-2), average (2.1-2.5), or excellent (2.6-3) for some of the customer-experience requirements. These requirements have been linked to necessary strategies.

From this research, these customer-centric strategies have been linked in tracing the causes of problems found in certain areas. The strategy measurement model, which is the major output of this research, guides the measurement of the appropriateness of customer-centric strategies developed, and the outcomes of the customer-centric strategies implemented. The appropriateness is measured before implementation, with customer participation. The outcomes are measured after implementation, testing how it was implemented.

For an easier use of the framework, it has been converted to a spreadsheet, and a screenshot has been provided in the Figure 6.42 below. The excel sheet can be created by copying the framework from the word document, and pasting it on the excel document. The average values can be computed based on the formula in the final version of the framework in Figure 6.43 below. The framework can be downloaded using this link (https://bit.ly/2Oal3hz). The following formula was used to display the low/medium/high results.

1.	CET Average L/M/H	=IF(J4<2,"L",IF(J4<2.6,"M",IF(J4<3.1,"H"))) Filled in
2.	CER Average L/M/H	=IF(M5<2,"L",IF(M5<2.6,"M",IF(M5<3.1,"H"))) Filled in
3.	CCS Average L/M/H	=IF(P4<2,"L",IF(P4<2.6,"M",IF(P4<3.1,"H"))) Filled in
4.	Usability goals	=IF(C30<2,"L",IF(C30<2.6,"M",IF(C30<3.1,"H"))) extended
5.	Overall customer- experience results	=IF(C36<2,"Low Customer-experience",IF(C36<2.6,"Medium Customer-experience",IF(C36<3.1,"High Customer-experience")))

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1	в В	υ	٥	ш	ш.	ں ں	- T		\mathbf{x}		z	0	a	α
- 0	Customer Experience Target	Acti	ivity Ra	nking p	er user	1=L, 2=	M, 3=H	Ave	ET erage	Customer Experience Requirements	CER Average	Related CC Strategy	CCS Average	
		1	2	3	4	5	6 7	Γ/۱	н/и		L/M/H		H/W/H	
	< Reachable	3	-	-	-	-		-		1. Access to support	L	Information Technology	L	
ы	< Speedy response	2	2	2	2	2	2	2	Σ		L			
ω	< Helpful support	-	-	-	-	-	-			2. Response from support		Customer Knowledge Management	-	
-1	< Reliable support	3	-	-	2	3	2	3	Ξ		-			
00 თ	< Fast Product/Service	2	-	2	~	~	-			3. Product/Service Speed	_	Product Development		
9 E	/ Interactive Product/Service	-	ε	-	ε	-				4. Performance/delivery	L	and Service Design and Delivery	_	
5	< Mental effort	3	-	3		3	-	3	Ξ					
μ μ	< Cast effective	-	~		~		5			5. Value	Σ	Driving	_	
4	< Value for money	2	e co	2	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	2		2	Ξ			5 	J	
φ.	 Reliable Product/Service 	e	e e	e.	e				Ξ			Marketing	н	
t⊏ ©	 Functional Product/Service 	2	2	2	~	2	~	-	Ε	b. Lack of errors	Σ			
ε	< Smart Design	-	-	-	-	-	-			7. Reduced need for additional support		Operations	-	
22	< Simple Features	e	~	ñ	~	e	2	-	Ξ	8. Ease of learning	Σ			
5	 Meets brand expectations 		-	2	2			-	Ξ	9. Satisfying	Σ	Aesthetics	Σ	
ß	< Differentiation	-	-	2	2	ε	3	33	Ξ	10. Uniqueness	Σ	Innovation	Σ	
24	 Variety of Product 		-	-	2			-	Ξ	11 Droduct/Garning Accessibility	E	Distribution	Ξ	
25	 Variety of Platforms 	_	<u> </u>	-	~				Ξ		:		5	
26	< Interesting		-	2	2				Ξ					
27	< Reuse	-	-	3	7			-	Ξ	12. Engaging	Σ	Customer Relationship Management	Σ	
58	< Recommended			2	7				Ξ					
8 E	Usability goals:		Error	<u>Toler</u>	ant			icient		Effective		Easy to use		
8														
888	UG Combinations													
3 8	Overall Customer Experience Result									Low Customer Experience				
: 8														
8 ¢														

Figure 6.42 shows a filled-in screenshot of the excel sheet, with the following abbreviations:

Key:

L=Low, M=Medium, H=High 'K' column = CET Average Value 'N' column = CER Average Value 'Q' column = CCS Average Value

Figure 6.42: Screenshot of final version of the Framework on the spreadsheet

Customer experience Target (CET)			Ac I	tivity I nput: (Rankin L=1, M	g per L I=2, H=	Jser :3)		CE Ave	ET rage	Custor	ner-experience	CER A	verage	Polato	d CC Stratagy	CCS Av	verage	
Cust	Jinei	-experience Target (CET)	U 1	U 2	U 3	U 4	U 5	U 6	U 7	Value	L/M/H	Requi	rements (CER)	Value	L/M/H	Related	d CC Strategy	Value	L/M/H
Α	✓	Reachable										1. Acc	cess to support	А		Informat	ion Technology	A	
В	✓	Speedy response										2.	Response	<u>B+C+D</u>				<u>B+C+D</u>	
С	✓	Helpful support											from	3		Custom Ma	er Knowledge	3	
D	✓	Reliable support											support			N/G	nagement		
E	~	Fast Product/Service										3.	Product/ Service Speed	E		Product	Development	<u>E+F+G</u> 3	
F	~	Interactive Product/Service										4. P	erformance/ delivery	F		Servica L	e Design and Delivery		
G	✓	Mental effort												<u>G+H+I</u>			-		
Н	✓	Cost effective											5. Value	3			Pricina	<u>H+I</u>	
1	✓	Value for money															inenig	2	
J	~	Reliable Product/Service										6.1	nak of ourous	<u>J+K</u> 2		М	arketing	J	
к	✓	Functional Product/Service										0. 2	uck of errors					<u>K+L+M</u> 3	
L	~	Smart Design										7. Rei ada	duced need for litional support	L		Op	perations		
	~	Simple Features										8. Ea	se of learning	М					
м																A	osthetics	<u>M+N</u> 2	
N	✓	Meets brand expectations										9.	Satisfying	<u>N+O</u> 2					
0	✓	Differentiation										10.	Uniqueness			In	novation	0	
Р	✓	Variety of Product										11.	Product/	<u>P+Q</u>		Die	tribution	<u>P+Q</u>	
Q	✓	Variety of Platforms										Service	Accessibility	2		DIS		2	
R	✓	Interesting												<u>R+S+T</u>		6	D 1 1 1 1 1	<u>R+S+T</u>	
S	✓	Reuse										12.	Engaging	3		Custome Ma	er kelationsnip nagement	2	
Т	✓	Recommended																	
		Usability goals:			Ef	ficient				Error	tolerant			Effective				Easy to use	
					A	BCDF					EPQL			GHIJKM				NORST	

Figure 6.43: Framework Final version

6.4.4 Stage 4: Integration and Verification of Information Systems

When the tests have been conducted to assess the appropriateness of the strategy, and results have been generated, the strategy can be implemented, and the systems designed can be integrated. The framework below shows how software and hardware can be used in the integration of the systems. The system can then be tested again to determine the success of the strategies. The framework in Figure 6.44 shows innovative services and products as the final output, resulting from business operations backed by customer knowledge in the information systems. The model shows that this knowledge is stored in a managed database, allowing ETL (Extract, Transform, and Load) functions. This helps in the management of big data, and can benefit from SQL applications.

The use of software as a service (SaaS) applications such as SAP Hana, Power BI, SAP SD, and MS Excel makes these possible. These software help provide business intelligence for integration through enterprise resource planning. CRM, HRM, and Financial analytics are easily performed, resulting in improved internal processes for the business. These internal processes are characterised by the change management processes required for the integration of the systems, upgrade, and adoption of customer-centric strategies. The change of information systems as a project can be managed using agile techniques. The business networks and supply chain are also integrated and improved, as well as the product development and service design process. The product and service prototype design can be integrated, allowing co-creation with customers. This system management process can aid in improving the operations of the business, and improved their interactions with customers.



Figure 6.44: Integration of Business Systems

6.4.5 Stage 5: Operation and Maintenance: Post Data Collection Activities

The fifth stage involves the measurement of the strategies executed without prototypes. The real products and services of the business are tested, and errors are discovered and solved. The maintenance should be done alongside system enhancements, and could lead to the identification areas for development or change in the systems. The SCRUM project management method is helpful in managing this change process. Although this work focuses on the development of the framework, and the process for use has also been described, a description of post-framework activities is also beneficial for managers to identify the results from the strategy and necessary changes to be made to their strategy because of the outcomes of the analysis. Improvement opportunities that are available to management which can be selectively addressed in order to improve particular strategy outcomes are provided in Table 6.56 below. Their priority and impact levels are assessed based on data collected in the research.

Strategy for	Possible	Solution by	priority and degree of impact on user-experience
customer- experience	Priority	Impact	Solution
	Medium	High	Proactively develop customer-centric strategies aimed at improving customers' experience
	High	High	Review performance regularly using the framework provided
1. Customer- centricity	Medium	Medium	Have a customer-experience department in charge of customer knowledge management and relationship management
	High	Medium	Do a cost-benefit analysis to ensure strategic fit
	High	High	Have an employee performance management system that monitors and assesses productivity for customer- centricity.
	High	High	Have multiple support systems (including, but not limited to printed and e-copy user manuals, website support, well displayed email addresses, contact addresses, and phone numbers, instant chat systems, stand by store assistants, and self-help machines)
	High	High	Integrate the support systems for each business function, department, and business operations
2. Information	High	High	Ensure the systems are functional in their individual departments
rechnology	High	High	Ensure the systems facilitate all stages and modes of interaction with customers
	High	High	Ensure all types of support provided for users are easy find and interact with
	High	High	Ensure all support outlets are connected to up to date information about all products and services offered by the business

Table 6.56: Possible solutions to problems with strategies for improving product development and service design

	High	High	Improve customer orientation by understanding the needs of the customers, their demographic characteristics, and behaviours.
	High	High	Collecting, storing, using, sharing, learning and reusing this knowledge to provide support to customers at all stages of interaction to ensure they have a positive experience.
3. Customer Knowledge Management	High	High	With a properly integrated information system, knowledge will be readily available to ensure quick and reliable response from whatever mode of support provided by the business or used by the customer. This fosters good communication flow within the organisation, and between the business and the customer.
	High	High	A knowledge management system can be customised or outsourced to foster this level of knowledge and communication for the business.
4. Operations	High	High	A smart design will help reduce or eliminate customers' frustration with the product and service, and in turn the business. A smart design or features that is not only innovative but fully functional could include the provision of customised help for customers in the case of services, or physical features in a product that basically make it seem like the product operates itself.
	High	High	Reducing order to delivery time of products and services
	High	High	Reducing wait time and eliminating queues
	High	Medium	Demonstrating how the products or service can be used
5. Product	High	High	Ensuring the design and features of the product and service are smart enough to reduce additional mental effort
Development and service design and	High	High	Updating customer orientation on a regular and ensuring all points of contact are trained and updated on best practices for delivery
denvery	High	High	Having a behavioural and emotional understanding of the customers and how to cater/minimise/approach these feelings as required.
	High	High	Because customers need to feel important and recognised, a 'family' feeling is very important in- service delivery, and provision of products that very clearly and proactively anticipate the needs of 'minority' groups is important in product development.
6. Aesthetics	High	High	Though products and services should have smart, innovative features, these features also need to be simple and provide satisfaction to the users by meeting their expectations.
	High	High	Businesses need to ensure that the process of interaction that a customer must go through is simple enough for them, so that it does not feel like a chore,

			but rather an enjoyable interaction.
	High	High	It is necessary to do same with products, ensuring that the smart features included in the products are also simple and easy to learn.
	High	High	Businesses should aim to provide satisfaction by amplifying the physical features of the products and services to attract customers.
	High	High	This could be through identifying aesthetically suitable designs for the any area of the business the customers have contact with such as websites, the stores, the products, the logos, the process, and even the people or staff in the organisation.
	Medium	Medium	This also extends to agents or suppliers to the business.
	Medium	High	To ensure a product or service has unique features requires the identification of market needs that so far have not been met by other products and services in the market.
7. Innovation	Medium	Medium	Individuals are usually pleased to have access to products and services that are not common or can be accessed by every individual and from every business. It amplifies the value of the product or service by a great deal because it makes individuals feel important since they are among the few that have access or are enjoying this service or product that cannot be found or bought everywhere.
	High	High	The prices placed on products and services need to be worth the experience being offered. Increase the value or experience provided by including additional and or innovative features or reduce the price.
8. Pricing	High	High	A product or service might come cheap, but certainly needs to meet the customers' expectations for which they bought it, and it needs to last relatively long.
	High	High	A product or service could also be pricey, but should either be promoted or designed with features that give users the level of satisfaction that either equates or surpass the amount of resources they will spend in acquiring and using the product or service.

9. Marketing	High	High	For products and service to be reliable, businesses should not falsely represent or over promise in in the description and promotion of the product or service. They need to deliver the level of experience being promised to customers either through advertisement, promotion, or description of the product or service. If a business over-promises, advertises, promotes, or describes features not included in the product or service, and the users have negative experiences as a result, a good solution is to include the feature even if it is for a higher price. The best thing however is to avoid this in the first place by making sure the marketing strategies represent the true operations of the organisation and the products so as not to increase the level of errors and negative experience.
	Medium	High	Give customers options. Individuals like to have choices, so they do not feel like they are being forced or controlled to behave a certain way. That is human nature, and it applies to their behaviours as customers. It is necessary that there are a range of options for a certain category of product or service being offered. This could be by physical features such as colours or shapes, or by internal designs.
10. Distribution	Medium	High	The products and services need to have options for different individuals all addressing their different needs to show that the business is conscious of different social groups and their needs.
	High	High	It is also important to have multiple platforms for interaction with the customers such as stores for accessibility, gadgets on which services can be accessed, methods of communication, and external devices required for the use of the product or service. When there are numerous platforms, it increases the number of possible users of the product and service.
	High	High	Ensure that all units of the supply chain are well informed of the customer-centric goals, and work towards it as well.

	High	Medium	Maintain an up-to-date customer database, with relevant information and experiences. Use these customer-information files to help improve journey mapping and personas
	Medium	High	Invest in software for CRM, and a trained department for CRM management. Customer relationship highly depends on the efficiency of the information systems and the effectiveness of the knowledge management processes.
11. Customer	High	High	Use the knowledge acquired about the customers to tailor the services offered in order to keep them interested in the company and engaged in their products and services
Relationship Management	Medium	High	Regularly analyse the database by behaviour patterns and data mining
	High	High	Research user behaviour (even beyond data mining), and understand what customers need from the products and services on a personal level and aim to meet these needs.
	Medium	Medium	Select and target the customers with frequent (direct and indirect) interaction
	Low	Medium	Relationship marketing to improve quality of experience
	Medium	High	Measure performance regularly with user interviews. Tasks or activities should include the performance of CRM software used, and should cover the requirements and targets in the framework developed.

Table 6.57: Solutions for improved service delivery and product development



This section helps the user to make use of the process, in that it links any identified problem back to strategies. The diagram in Figure 6.45 illustrates that all customer-centric strategies, especially knowledge management, will benefit from appropriate information systems employed.



Figure 6.45: Sub Strategy Connections

- 1. Problems with Customer Relationship Management can largely be solved by making improvements to Information Systems.
- 2. Problems with operations can largely be solved by making improvements to CRM.
- Problems with knowledge management can largely be solved by making improvements to CRM
- 4. Problems with aesthetics can largely be solved by making improvements to operations.
- 5. Problems with distribution can be traced to operations.
- 6. Problems with innovation can largely be traced to CKM.
- 7. Problems with pricing can largely be solved by making improvements to innovation
- 8. Problems with marketing can largely be solved by making improvements to distribution.
- 9. Problems with product and service design can be traced to all the other strategies

6.4.6 Summary: Strategic Fit Map

The strategic-fit map in Figure 6.46(a-c) summarises these 5 stages and provides a guide for the alignment of internal resources to meet external business needs of a customer-centric organisation.

It is a step-by-step guide to the development, implementation, and measurement process of customer-centric strategies in manufacturing and service companies. The strategic fit map provides a more detailed process for the pre-data collection process.

Category 1: Requirements Definition

- 1. Step 1: Analyse external business environment and review business VMO (vision, mission, objectives), Market and Industry, and stakeholders.
- 2. Step 2: Generate and evaluate customer-centric strategic options based on standards in the strategic-fit map below.
- 3. Step 3: Select the strategy and identify its place in Ansoff matrix identified in the strategic-fit map.

Category 2: Systems Design

4. Step 4: Prepare relevant systems and technology to allow successful innovation and effective knowledge management as identified in the strategic-fit map.

Category 3: Implementation

5. Step 5: Measure the appropriateness of selected strategy following the strategic-fit map and targets in the measurement model.

Category 4: Integration and Verification

- 6. Step 6: implement knowledge management training through HRM systems
- 7. Step 7: Implement the strategy based on customer-centric sub-strategies as shown in the strategic-fit map.

Category 5: Operations and Maintenance

- 8. Step 8: Monitor the customer-centric strategy implemented and employee performance.
- 9. Step 9: Measure the outcomes of the strategy following the strategic-fit map, and the measurement model.
- 10. Step 10: Review expected performance of factors shown in the strategic-fit map.



Figure 6.46a: Customer-centric Strategic Fit Map



Figure 6.46b: Customer-centric Strategic Fit Map



Figure 6.46: Customer-centric Strategic Fit Map

6.4.7 Requirements for Framework Implementation

The Table 6.58 below suggests resources and requirements for implementing the framework to improve product development and service design. This process has been tested in separate organisations as shown in section 6.3. It was completely satisfactory, and the feedback detailed in section 6.3.3 shows the areas of business operations that managers realised they were lacking for improved customer experience.

	Manufacturing	Service				
Number of products required for analysis	One per session	Up to 7 per session				
Number of users per task	7 users per task					
Number of tasks	7 tasks					
Time per user	45-60 minutes per user to comple	ete all tasks				
Number of experts required	2					
Areas of expertise	Customer experience manageme	nt				
Level of expertise	Associate customer experience m	nanagement				
Training required	Usability testing using think aloud	l protocol				
Time required for requirements definition	40 hours research, business revie environment 40 hours generation and evaluati of strategy	w, and analysis of the external on of strategic options, and selection				
Time required for Systems design	40 hours technology and systems check 40 hours simultaneous prototyping					
Time required for implementation	ateness					
Time required for systems integration and verification	ystems 40 hours HRM KM training ification Strategy implementation varies depending on the size and type of business.					
Time required for post data collection activities	Quarterly monitoring of strategy Annual measurement of custome Annual review of performance fa	results er-centric outcomes ctors				
Expenses	Training for Usability testing usin Equipment: Video recorder MS Excel HRM KM Training	g think aloud protocol				
Summary time commitment	200 hours 5 weeks 25 days					

6.5 Summary

The final version of the framework for measuring the appropriateness of a customer-centric strategy, as well as the outcome of the strategy was developed in this chapter. The main research question was answered, showing how usability can serve as a basis for customer-centric strategy measurement. In this chapter, the process for implementation was described, thereby answering the bread research question, and showing how usability can serve as a basis for customer-centric strategy measurement. The chapter began with the validation process of the framework, from which corrections to the framework were made. The second section was the testing process of the framework, from which more amendments were made. These amendments and the final version of the framework were developed in the last section of the chapter. The chapter showed the mutual relationship between usability and customer-centricity, how strategy can be measured and possibly developed by usability standards, and the importance of appropriate strategies to ensure customer-centricity. Based on the results of the validation and testing process, the framework is relevant, easy to use, and applicable in the measurement of customer-centric strategies, and as such achieves the aim of the research. The next chapter provides a conclusion to the research.

Chapter 7: Conclusion

7.1 Introduction

In this chapter, the value of the research is discussed. A summary of the key stages in the work is provided showing how these stages aided in answering the research questions:

- How effective are existing strategy measurement processes and tools in improving service design and product development?
- 2. How does strategic fit influence the success of an innovation and effectiveness of knowledge management, which serve as the basis for business performance?
- 3. How can usability methods be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience?

The broad research question is 'to what extent can usability serve as a basis for customer-centric strategy measurement?' The chapter also provides a discussion of how the research contributes to literature and industry. The limitations faced in the course of the research are also addressed, and recommendations for further studies are provided.

7.2 Research Summary of Objectives Addressed

The aim of the research was to construct a framework for assessing the appropriateness and outcomes of customer-centric strategies in manufacturing and service organisations, through the application of Usability measurement with the aim of improving customers' experiences with products and services, thus enhancing business performance. This was achieved by answering the research questions stated in section 7.1 above. These questions were developed from the following research objectives:

- Examine the relevance and shortcomings of existing strategy measurement processes and tools in improving service design and product development in manufacturing and service organizations;
- 2. Analyse the impact of strategic fit on successful innovation and effective knowledge management as the basis for business performance;
- 3. Develop and apply Usability methods in assessing appropriateness and outcomes of strategy in order to help enhance products and services for improved customer-experience.
- Propose recommendations and a framework for improving product and service design strategy, and;
- 5. Facilitate improved strategy delivery through developing an approach for correcting Usability problems found in product and services.

Table 7.59 summarises the key stages of the research and how the research objectives were systematically achieved, with reference to the sections of the thesis where they were achieved.

The conclusions for each of the tests listed in section 3.5 of the methodology chapter are that:

- The outcome of customer-centric strategies is significantly improved by the use of an appropriate information system in implementing these strategies, and the adoption of an appropriate process for the development and implementation of the strategies.
- The usability goals of error tolerance, ease of use, effectiveness, and efficiency are significant and can be used in measuring the appropriateness and outcomes of customer-centric strategies.
- There are no significant differences between experiences of users based on the age of users. However, there are significant differences between user-experience of different gender, technological expertise, and frequency of use of the products and services.
- Product development and service design strategies can be improved by incorporating usability targets in the strategy development and measurement by manufacturing and service companies
- 5. Customer-centric strategies are measurable by usability targets in manufacturing and service companies
- 6. A significant relationship exists between high customer-experience with products and services of manufacturing and service companies, and the customer-centric strategies identified in the research
- 7. Effective knowledge management improves customer-centricity, and can lead to successful innovation in manufacturing and service companies
- 8. There is no significant relationship between customer-centricity and financial performance in manufacturing and service companies
- 9. Customer-centricity improves business performance in terms of innovation and knowledge management.

	Activity	Justification	Objective	Chapter or Section
			addressed	
1.	Over 600 managers, who are involved in strategy	To gain business perspective on:		
	implementation in sales, design, and customer	How existing strategy frameworks take account of essential		
	service departments in 10 sectors were contacted	user-experience targets;	Objective 1 Objective 2	Chapter 4
	to participate in the survey. 103 surveys were	Innovation and knowledge management practices in		
	completed.	organisations, and;		
		The level of inclusion of user-experience targets in the strategy		
		development process.		
2.	User testing phase 1:			
	5 User observations with products from 2	These are the main and appropriate methods of data collection,		
	companies in 5 manufacturing and 5 service	to gain users' perspective on features of good customer-		Chapter 5
	sectors to narrow the scope of sectors for user	experience.		Chapter 5
	interviews. 100 user-tests.			
			Objective 3	
3.	User testing phase 2:		Objective 5	
	24 user interviews. Observation, and survey			
	across 2 sectors based on a random selection of			Chapter 5
	individuals matching criteria from PACT Analysis			
	to gain user perspective on customer-experience.			
4.	Analysis: Factor, Template, MANOVA	Factor Analysis for grouping and showing relationships between questionnaires variables. Template Analysis to show themes in user interviews based on UX targets MANOVA to show significant difference between demographics and interview results	Objective 3	Chapter 5
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5.	Financial analysis	To ascertain whether the combination of the sub-strategies put together in the conceptual framework developed in this research enhances the profit of customer-centric organisations, and to determine whether customer-centricity improves financial performance.	Aim	Chapter 4
6.	Validation with 32 managers concerned with strategy implementation	To further improve the conceptual framework to help ensure that it is relevant to manufacturing and service organisations and can measure the relevance and outcomes of customer- centric strategies.	Objective 4	6.2 Validation
7.	Trial of the framework with 2 service and 1	To make the final version of the model and develop the	Objective 4	6.3 Trial
			Objective 5	
8.	Requirements for framework implementation	appropriateness and outcomes of customer-centric strategies	Objective 5	6.4 Framework Implementation

7.3 Discussion: Value of the Research for each Research Question

The broad research question is 'to what extent can usability serve as a basis for customer-centric strategy measurement to help improve business performance?' This research shed light on usability targets for improving customer-experience with products and services which could sometimes be unknown to, or ignored by, organisations that intend to be customer-centric. By so doing, usability was connected to the concept of strategy management based on a 2-part data collection from organisations and customers, showing the place of usability in the product design lifecycle. Most importantly, a framework with detailed targets for measuring the outcomes and appropriateness of customer-centric strategies was developed based on customers' perspectives of what their experiences were with products developed and services designed. The research provided novelty by answering the research questions and achieving the research objectives.

7.3.1 Research Question 1: How effective are existing strategy measurement processes and tools in improving service design and product development?

The first research question was answered by achieving the first research objective, which was to 'examine the relevance and shortcomings of existing strategy measurement processes and tools in improving service design and product development in manufacturing and service organizations'.

Answering this research question required the identification of as many strategic management tools as possible (list in appendix 6). A method for selection was then assessed with other decision support tools (section 2.4.3), and used in selecting a few tools for application in the research (section 2.4.4). The major criteria for selection was the key research question stated in the introduction of this chapter. The review considered the impact of macro, micro, and internal environmental drivers on strategy development processes.

Similar to findings by Collin (2004), it was found in the research that strategy development processes are affected by changing environmental drivers in both macro and micro environment. The research did not take an in-depth look at the effect of the political and economic environment on developing customer-centric strategies. More focus was placed on socio-cultural and technological drivers of the environment. This is mostly because the political and economic environments have been well studied, and in a sense do not have much of a direct impact on customer-experience as socio-cultural and technological drivers do.

The research however considered the global environment and its effects. This was done by including a diverse group of individuals in the user tests from different nationalities, discussing how cultural and technological differences affect their experience with products and services.

For instance, participants from countries with the left-hand wheel vehicles have a not-so-positive experience with vehicles used in the United Kingdom, as they are right handed.

The research also considered the influence of age, gender, technological expertise and frequency of use of products of services on customer-experience. These drivers are to be considered in the strategy development process of organisations. The usability study showed that gender affects customers experience with speed of delivery of services and need for support when making use of products. It was found that individuals of male gender tend to have problems with speed of products and services (when slow), and the female gender have problems with the frequent need for support with the services provided.

Technological expertise also has a major impact on how customers feel about access to products and services, variety of channels and platforms provided. Frequency of use of a product or service also influences a customer's need for support, access to support, need for additional resources for use, and interaction with the product and service. Lastly, age and technological expertise have a general impact on customer-experience. Sociocultural differences are deep rooted and expected and cannot be changed. Therefore, to provide positive user-experience, organisations need to work around these differences in developing customer-centric strategies.

Adding to internal drivers, research and development which was not as researched as the other drivers mentioned plays a major role in customer-centric strategies. The lack of awareness of business strategy in organisations as was also suggested by Niemann-struweg (2013) might be a major cause of low employee productivity in a customer-centric business, as they lack understanding of the changes or developments in the organisations. The strategic management tools were selected in literature review to determine their value and shortcomings in strategy measurement. Based on the requirements of user-experience studies discussed in the literature review, the strategy tools were chosen and assessed using the strategic choice approach framework for decision support. Primary data was also collected to further assess the applicability of the tools for strategy measurement. In the research, it was found that existing measurement tools many times fail to measure how strategies provide customer-experience, the friendliness of use of products, information systems capability, knowledge management, employee productivity, attractiveness of products, and validation of products.

However, they look at other 'profit direct' measurements such as customer acquisition rates and retention rates which do not directly help in improving product development and service design. They also look at financial measurements such as revenue and growth. The tools measure generic factors of learning and growth and internal consistency not just in the area of customer-centricity. This is no surprise, as Lynch et al. (2012) also suggested that companies are too inwardly focused, failing to consider customer and market needs.

This can be linked to findings by Bastin and Muchlish (2012) that companies often choose to make use of traditional performance measures they can directly link to profitability. It was found that existing measurement tools many times fail to measure how strategies for improved product development and service design, affecting the provision of positive customer-experiences with businesses. Businesses are usually too inwardly looking most times and tend to overlook the importance of having friendly, attractive, and customer-validated services and products that connect to the users' needs. The research showed how user testing aids in understanding users' needs, thinking process, and behaviour.

This is important because being inwardly focused negatively impacts service design and product development. Most of the processes also do not properly support information systems and knowledge management, which happen to be the most important measures of performance for customer-centric manufacturing and service companies and requirement for having successful outcomes from product development and service design strategies. The existing processes are relevant in measuring financial outcomes, and other generic non-customer-centric learning and growth performance, and areas of business internal consistency. They tend to overlook areas like communication within the organisation and with the customers, or employee productivity in terms of quality of interaction and relationship with customers, thereby hindering the successful experience of customers with products and services.

7.3.2 Research Question 2: How does strategic fit influence the success of an innovation and effectiveness of knowledge management, which serve as the basis for business performance

The second research question was answered by achieving the second research objective. The second objective was to analyse the impact of strategic fit on successful innovation and effective knowledge management as the basis for business performance.

Strategic fit improves results for businesses in terms of increased customer acquisition, increased customer retention, long term know-how, and increased profit. This is based on the effective identification of external threats in the organisation. When businesses go beyond identification, and actually manage the threats by implementing appropriate customer-centric strategies, they benefit from improvements in employee skills for knowledge management and better product development for innovation. However, some customer-centric businesses fail to align their internal resources, upgrade their technology regularly, invest in research and development, and consider future market needs, and as a result do not have innovative products or services.

Furthermore, some customer-centric organisations currently excel at knowledge storage, but fail to use, share, and reuse the knowledge in improving their performance. A guide to improving information systems is provided in section 6.4.

Business environmental drivers for manufacturing and service companies were identified and divided into two parts: the external and the internal business drivers. Business performance in this work was represented by innovation and knowledge management rather than financial measures. This is because modern research (Efrat and Shoham 2012; Dibrel et al. 2015; Karagiannopoulos et al. 2011; Lisboa et al. 2011; Mazur and Strzyzewska 2010) shows that innovation and knowledge management are the basis of business performance, and more suitable for product development and service design strategies in the context of this work. Literature review in this area revealed the problems companies face with entrainment or strategic fit.

Like most of the literature in this area, it was found in this research based on users' preferences, that exploitation and exploration of internal resources leads to strategic fit, in the sense of actually meeting market needs. Literature also showed the importance of market orientation, customer orientation, and competitor orientation in achieving balance in entrainment (Chatzoglou 2014; Demirguc et al. 2006; Dibrel et al. 2015; Efrat and Shoham 2012; Lee 2008; Lisboa et al. 2011; Mazur and Strzyzewska 2010; Moon 2006; Wagner 2015; Ward et al. 1995; Yang 2014; Zhou and Li 2010). Results from the user interviews correlate with literature, as they show the need for proper customer knowledge and relationship management in order to provide improved customer-experience. The research also showed the importance of identifying and managing threats from market and competitors in order to achieve a balance in entrainment.

Furthermore, in connection to previous research (Benson rea et al. 2013; Bock et al. 2012; Barney et al. 2009; Calatone et al. 2002; Chatzoglou 2014; Dibrel et al. 2015; Efrat and Shoham 2012; Franke et al. 2009; Lisboa et al. 2011; Lynch et al. 2012; Marr et al. 2004; Mazur and Strzyzewska 2010; Miles and Russell 1995; Mooler et al. 2002; Wong and Aspirwall 2004; Ziglan et al. 2007), this work confirms that: the management of knowledge as a strategy; customer relationship; management of technology; organisation culture, and; innovative product development are important internal drivers of the business environment required to achieve balance in entrainment and improve product development and service design. The analysis of the user tests and questionnaire data showed the need for these factors in achieving strategic fit in customer-centric manufacturing and service organisations.

The research did not find differences between the management and processes of innovation or knowledge management or customer-experience in manufacturing companies versus those of service companies.

The research confirmed that customer-experience standards do not differ by sector or any basis. Lastly, considering the findings by Lynch et al. (2012), organisations that are too internally focused face the danger of missing opportunities arising from changes within the external environment.

For this reason, customer-centricity is proposed, as a means of looking at business beyond the financial lens, to help understand their customers, and gain advantage over competitors and the market.

7.3.3 Research Question 3: How can usability methods be applied in assessing appropriateness and outcomes of a strategy in order to help enhance products and services for improved user experience

The third research question was answered by achieving the third, fourth, and fifth research objectives.

The third objective was to develop and apply Usability methods in assessing appropriateness and outcomes of strategy in order to help enhance products and services for improved customer-experience. This was achieved in the course of data collection for the research. 20 usability targets were found in the review of literature, and linked to 11 customer-centric strategies found in the research. They were connected by customer-experience requirements found from the user testing process. These requirements and targets were used in making the research-based framework to be used in the assessment of the appropriateness and outcomes of customer-centric strategies to enhance products and services for improved customer-experience. The framework was revised through the course of the research, and changes were made based on data collected, validation, and trial.

The fourth objective was to propose recommendations and a framework for improving product and service design strategy. The framework was first developed from the review of literature in connecting the usability targets to the strategies. It was used in the user tests and further improved based on customers' perspectives on the requirements of customer-experience. The framework was validated and tested, and guidelines for the use of the framework were provided in section 6.4.

The fifth objective was to facilitate improved strategy delivery through developing an approach for correcting Usability customer-experience problems found in product and services. This was achieved in section 6.4.3 with the post-data collection activities described when using the framework. Possible solutions for correcting usability problems resulting from inadequate strategies were discussed.

Although the bulk of this evaluation required data collection for actual determination of the extent to which usability testing methods can be applied in the process of measuring the relevance of strategies, the review of literature shed light on the ongoing interest in user-experience and strategies. This existing research on user-experience and strategies, though little around usability and human interaction, was built upon in this research to develop the conceptual model.

Aside from the identification and review of usability testing methods, and the selection of the most effective ways for strategy measurement, the literature review enabled the identification of the usability goals which need to be achieved in order to help deliver success to business performance. Research showed that no one method is best for usability testing. This was proven in this research, as think aloud and question asking were combined in the research in the observation, survey, and interview process as was also identified by Koutsabasis et al. (2007). It was proven that usability is applicable in strategy measurement for improving product development and service design in manufacturing and service companies.

Importantly, the nature of the concept of usability as explained by authors (Aalto et al. 2017; Babbar et al. 2002; Han et al. 2000; Hasdogan 1996; Kuuijk et al. 2007; Margolin 1997; Peter and Bevan 2009; Strawderman and Koubek 2006; Quesenbery 2004; Windlinger et al. 2016) allows it to be applied beyond the operational way it is currently employed, and beyond computer systems. The difference between market research and usability testing has also been clarified. Market research involves the collection of opinion allowing managers understand users' opinions, but user testing involves behavioural studies allowing businesses understand experiences, behaviours, and thinking processes. Aside from market research, some concepts such as TQM, SERVQUAL, or even lean manufacturing can be mistaken for usability, as an argument against the novelty of the application of usability for improved product development and service design.

Though these concepts are relevant in improving customer satisfaction with product development and service design, they do not consider all points of interaction between customer and organisation, it does not consider strategies relevant to improved customer-experience, and measure the outcomes of customer-experience strategies for improved product development and service design. There was concern that products and services differ, making it difficult to apply usability. The research addressed these, showing that usability allows for flexibility in its application. Whether is a product such as a TV or even cosmetics, or a service ranging from banking or retail to even education, the assessment with usability involves development of tasks in any aspect of interaction relevant to a product or service. The framework from this research can then be applied in assessing the results of the user tests on any product or service.

This research shows the importance of user testing and how it can improve product development and service design. An important novelty of the research is in the provision of targets for the improvement and measurement of existing strategies, and to guide implementation of future strategies. This is relevant to organisations already conducting user tests and those unaware of the practice. It provides detailed information for 'ignorant' customer-centric companies on what is expected to be customer-centric.

The first version of the conceptual model was developed for data collection based on the review of literature. A section in the questionnaires was devoted to data collection that examined the relevance and shortcomings of existing strategy measurement processes and tools in improving service design and product development in manufacturing and service organizations. The questionnaire sample is valid based on Gaussian sampling. User sample is also valid based on research for PACT analysis, and the findings are valid based on triangulation. After the analysis of both questionnaires, the second version of the model was developed to include the customer-centric strategies identified and refine the usability goals. Furthermore, it was necessary to define the types of strategies because some strategies would have not been relevant to improving user experience, for instance it would have been impossible to measure financial performance for instance with usability.

Only relevant strategies of business that play a role in improving customer-experience or result from customer-experience were included. The first version of the model had already been developed. User tests were then done to test the applicability of usability as a concept in strategy measurement. First pre-data was collected to narrow the scope for in-depth collection. Then, the main interviews were conducted to give the bigger picture of the possibility of applying usability methods for assessing appropriateness and outcomes of strategy in order to help enhance products and services for improved user-experience. Participants were selected based on criteria developed in PACT analysis. Criteria was broad, as literature finds that experiences of any two individuals definitely differ despite the nature of their selection e.g. gender, age, etc. The results were evaluated, and the framework was modified in chapter 6. The framework resulted from the finding that 'customer-centric strategies' are usually inappropriate and poorly implemented.

The model however does not give detailed recommendations for the improvement of innovation and knowledge management in an organisation. It does not provide detailed answers to the ways an organisation can improve individual customer-centric strategies. It shows how performance can be assessed, and how problems found with products and services can be traced, but not how problems primarily accruing from the detail of operations, marketing, relationships, etc., can be solved.

This is because, though very necessary to the improvement of business performance, the research was aimed at measuring the appropriateness and outcomes of a customer-centric strategy, and not providing solutions to all business functions that may be faulty.

There is research in these areas however, but they may need to be refined from a customer-centric point of view. This whole process generally led to the development of an approach for correcting usability problems found in product and services to facilitate improved strategy delivery.

This basically involved co-development of products and services with customers considering the targets set in the research. The process application for correcting usability problems found in products and services as found in literature (Reichelt 2015) acknowledges the differences that exist in user-experience from one product to another. However, as was found in the research, similarities in business operations exist in processes such as technology used for sales, human contact with customers, or the abstract concept of innovation and aesthetics. Therefore, following Burgess (2016) an iterative human centred design is required.

There can be a view that one framework cannot work for even 2 different companies in the manufacturing industry, let alone of manufacturing and service industries. The conceptual framework does not aim to guide the development of products or services (although it could be helpful), neither does it 'unify' the operations of manufacturing and service companies. The framework has a wide application as it is applicable in measurement of customer-centric strategies for improve product development and service design in both large and small-sized manufacturing and service companies, as is demonstrated in the validation chapter 6.

The final version of the conceptual framework shown in section 6.4 is a data driven theoretical structure of assumptions, principles, and rules relating to user-experience that holds together the ideas comprising a broad concept of customer-centricity

7.4 Contribution to Business Practice

The strategic management of business performance requires appropriate processes to enable successful outcomes. This research has provided a usability-based framework to aid with strategy measurement as a form of business performance measurement. The framework which suggests the incorporation of usability in the product or service design process is data based, validated, and tested as relevant for use in manufacturing businesses, and service providing businesses. The model was suggested to be used based on the waterfall model for product and service design as illustrated in section 6.4.6. The framework from this research consists of targets that have been validated and found to be relevant in connecting to the needs of users, and improving product development and service design for businesses.

Compared to design processes without usability, the framework can improve the chances of achieving customer-centric goals for businesses, and can help businesses be more innovative through better management of customer and knowledge. The research has provided a method for improving business performance by ensuring customer-centric strategies developed are appropriate, and successful when implemented.

The think-aloud protocol (TAP) for usability testing has also been tested in this research to show its appropriateness in improving customer experience with products and services.

The application of user testing in the process of measuring customer-centric strategies as proposed in this research can enable the development and design of products and services that are friendly and attractive to customers, and ensure businesses are not too inwardly focused. Compared to design processes without usability, this process allows businesses to consider customers' needs, and understand their thinking process and behaviours, thereby positively impacting customers' experience and interaction with the business as a whole.

The research also shows that a customer-centric business needs to monitor the performance of certain strategies to ensure positive business outcomes. These include the information systems strategies, innovation strategies, knowledge management strategies, product development strategies, service design and delivery strategies, customer relationship management strategies, marketing strategies, distribution strategies, aesthetics strategies, pricing strategies, and operations strategies. The research showed that the alignment of resources in these areas would lead to strategic fit for businesses.

The research showed that improved product development and service design relies on the usability of the products and services, and as such the performance should be assessed based on effectiveness, efficiency, ease of use, and error tolerance. The research showed that unlike other design processes that do not incorporate usability, usability methods and principles are applicable and relevant in the measurement of customer-centric business strategies. This is because having customer-validated products and services has a positive impact on the success of the business strategies. The research also showed that the PEST, Porter's 5 forces, value chain analysis, cost benefit analysis, Porter's generic and Bowman's clock, Ansoff's matrix, and the Balanced Scorecard are strategic management tools that can incorporate usability and user experience targets in the development and implementation of customer-centric strategies.

7 users was the number suggested for the user testing process, and the framework on an Excel sheet can be accessed (https://bit.ly/2Oal3hz) to enable easy input of user data for tasks set.

In summary, key elements of contribution to practice are: the development of a model to enable companies design and develop customer-friendly and attractive services and products respectively.

7.5 Contribution to Literature

7.5.1 Novelty in User-experience Strategy Measurement

The research showed the connection between user-experience from usability studies and customerexperience from business and management studies. This connection was used in the framework as the requirements for achieving customer-experience targets, and successful customer-centric strategies.

The research showed that customer-experience with a business is characterised by access to support, response from support, nature of delivery and performance, speed, value, lack of errors, reduced need for additional support, ease of learning, satisfying, unique, accessible and engaging. The framework proves and illustrates the connection between usability and strategy measurement. It shows the connection between usability as a concept and strategy management. The relationship between customer and user-experience was established, and the need for improved user-experience on the operational scale to achieve customer-experience on the strategic level was emphasized. Usability has been studied over time on an operational level. However, the novelty of this research however is that usability is linked to strategic outcomes of the business, of which operational outcomes are also included. That said, the research provides a solution to measuring and maintaining a long-term goal of improving customer-experience with the organisation, through their products and services at all points of interaction.

A research-based model was also provided in chapter 6, to guide the measurement of the appropriateness or outcomes of strategies set to improve user-experience based on customer knowledge.

The model is applicable in assessing strategies through interaction with products, interaction before sale of products, interactions during sale, and interactions after sale, with technology, or in person. By adopting the customer-experience measurement plan proposed in the research, organisations can identify if they truly possess competencies required to meet the long-term goal of improving customer-experience with their organisation. The framework introduces customer participation in strategy measurement. The model allows open innovation, enabling companies to adopt and possibly develop new technologies to meet the ever-changing needs of customers and the market. Organisations will also be able to monitor their competitors' user-experience strategies in a sense, because while using the products and service, customers can compare them to other products and services. The research also advances literature on industrial design by properly including service delivery in user-experience research. UX was studied beyond product design orientation, to provide a framework for the service providing aspect of manufacturing companies, and for service companies as well.

7.5.2 Novelty in existing Strategy Tools

Problems with existing strategy tools for measuring customer-centric strategies were identified through literature review and survey completed by managers.

These problems were addressed by proposing a framework to measure the appropriateness of customer-centric strategies, enable the effective measurement of their outcomes, and guide the development of appropriate customer-centric strategies and enabling proper implementation.

The targets were introduced from usability studies, and triangulated by observations, surveys, and interviews in the user tests. The strategic fit map also addresses the problem of poor implementation of customer-centric strategies by illustrating a step by step process to customer-centric strategic management in manufacturing and service businesses. A guide was provided to support the use of the frameworks and the user testing process.

Research shows that existing strategy tools are not necessarily appropriate to the management of strategies for the improvement of product development and service design and do not measure the appropriateness of customer-centric strategies; neither do they enable the effective measurement of their outcomes. Furthermore, existing tools have failed in guiding the development of appropriate customer-centric strategies and enabling proper implementation.

In fact, a good number of 'customer-centric' manufacturing and service organisations lack the requirements to claim the label. The major contribution of the research is the provision of a framework in chapter 6 for assessing the appropriateness of customer-centric strategies on the one hand, and the outcomes of these strategies on another for the improvement of products and service design. The research provided research-based targets for improved product development and service design. In the evaluation section 5.7, the feasibility of including user experience targets in strategy development was assessed. These targets were developed based on behavioural research and interviews with users, who were observed and gave their opinions on products and services which they made use of during the research. Problems and solutions associated with customer preferences were associated with types of business operations and functions, which enabled the identification of relevant customer-centric strategies for improved customer-experience with products and services.

Associations between these strategies were found through statistical analysis for effective product development and service design. The research also addressed the problem of development of inappropriate customer-centric strategies through this provision and addressed poor implementation of customer-centric strategies by organising and providing a framework, explained in chapter 6, for achieving strategic fit. The data driven framework based on user-experience targets is provided to guide the development, implementation of customer-centric strategies, which is lacking in literature, and measurement of these strategies applying usability testing methods.

Unlike current strategy measurement processes that measure quantity of earnings, this framework measures the quality of outcomes in relation to the goal of customer-centricity. The framework encourages innovation and organisational learning in achieving business goals.

7.5.3 Novelty of balance in Entrainment and Strategic Fit

The research shed more light on the importance of entrainment in achieving successful innovation and knowledge management outcomes from customer-centric business strategies. It showed that the major causes of development and implementation of inappropriate customer-centric strategies for improve product development and service design are the lack of understanding of the requirements for customer-experience, and misalignment of internal resources. The major types of customer-centric strategies were identified, and in section 6.4.3, possible solutions to managing these strategies were provided. The research showed that the implementation of the following strategies improves customer-centricity of a business: Information systems, customer knowledge management, innovation, aesthetics, operations, pricing, distribution, customer relationship management, and marketing strategies.

The research found the impact of strategic fit on the success or failure of innovation, and effectiveness of knowledge management in manufacturing and service companies. Section 4.6 of the thesis shows that non-identification of threats, non-management of threats, and improper alignment of resources as suggested by Dibrel et al. (2015) and Lynch et al. (2012), especially employee skills, affect the development and introduction of new processes, and the improvement of products. This in turn hinders proper product development and increase in employee skills. Balance in entrainment however could lead to successful outcomes of innovative customer-centric strategies, including product development strategies, operations strategies seen in employees' skills, pricing strategies seen in annual profit, aesthetics strategies seen in customer acquisition, customer relationship strategies seen in customer retention, and knowledge management strategies seen in long term know how.

Misalignment also affects knowledge use, creation, and learning in the organisation. The research on knowledge management looked deeply into staff involvement and employee productivity in entrainment. The user tests which reflect in the model relate to expectations from staff for improved user-experience especially in the provision of support. Proper use of knowledge, IT, and employee resources will enable organisations to better achieve strategic fit. In relation to improving customer-experience with new or existing products or process, the framework shows how organisations can effectively manage knowledge, to achieve balance in entrainment.

Furthermore, considering customer-centricity depends on interaction at all touchpoints with the company, the research sheds light on the role played by information systems, knowledge management, innovation, distribution, pricing, marketing, aesthetics, operations, development, and delivery of products and services required for interaction between customers and the organisation before sales, during sales, and after sales, with technology, or in person.

7.5.4 Novelty in Innovation and Knowledge Management

The importance of innovation and knowledge management as basis for measuring business performance was emphasised, and the non-financial benefits (customer acquisition, customer retention, long term know-how, storage of expertise for reuse, organisational learning, accessible databases enabling knowledge reuse, improved employee skills) were identified. Knowledge management is reflected through innovation, and they both influence customer-experience. Though customer-centricity relates and benefits from innovation and knowledge management, there is no financial evidence that it guarantees profitability.

The research showed that customer-experience is largely enhanced through proper knowledge management, making it a major basis for measuring the appropriateness and outcome of customercentric strategies. Furthermore, the intensiveness of knowledge management, though important, does not do much for customers compared to quality of knowledge management. Quality knowledge management was found to be reflected in organisations operations and execution of their customer-centric strategy. Quality knowledge management involves proper information systems, and is executed through operations, relationships, design, aesthetics, delivery, innovation, marketing, pricing, and even distribution of products and services. Knowledge management quality forms the interaction with the organisation through the products and services.

The research also showed that there is a relationship between innovation and knowledge management and business performance of customer-centric companies. Innovation strongly reflects proper knowledge management, and largely influences customer-experience as well, making it an appropriate basis for measuring customer-centric business performance. Successful innovation increases customer acquisition, customer retention, long term know-how, and profit. Effective knowledge management allows storage of expertise for reuse, organisational learning, accessible databases enabling knowledge reuse, improved employee skills, increased profit, customer acquisition, customer retention and management of external threats, and are enjoyed by customer-centric organisations. A very important finding from the research is that though customer-centricity relates and benefits from innovation and knowledge management, there is no financial evidence that it guarantees profitability.

The reason lies in the cost centres that arise after the gross profit has been made. However, it was found that the results for the companies that performed below average has been on the rise over the past 3 years.

7.5.5 Novelty in the Strategic Choice Approach

In the literature review, the strategic choice approach was identified, selected, and tested to demonstrate how it could help in the objective selection of strategy tools. Rather than leave the choice of strategy development tools to subjective methods or chance, the strategic choice approach has been assessed and recommended in this research as a suitable method.

The research illustrated the applicability of strategic choice approach for objective selection of strategy analysis tools in manufacturing and service industries. Rather than leave the selection of tools and processes to intuition or chance of managers, as was found to be the norm in literature review, the process was used as a means of assessing the feasibility of tools to incorporate user-experience targets.

The selected tools in the literature review were further assessed in the evaluation section 5.7 and found to be feasible in the incorporation of user-experience targets when developing and implementing strategies. The strategic choice approach is a decision support system suitable for considering the relevance of the existing tools to the nature of the strategy to be implemented. The research however did not apply other decision support tools to determine their applicability. The conclusion was based on assessment using relevant criteria.

7.6 Limitations of the Research

The major limitations faced in the research were with the collection of data and the development of the conceptual framework, as discussed below.

7.6.1 Data Collection

Access to data was a major challenge with the research. It was almost impossible to get managers of larger-scale businesses to respond to the surveys for data collection or interviews for validation. A lot of emails were sent out at different stages of the research, but the responses compared to the number of emails sent were few. In the first place, getting the contacts was tedious, as most of this has to be done in person, and through various networks. The time for data collection could have been sufficient if the responses received were up to the minimum response rate required for the research. The low response rates and delayed responses worsened the time challenges.

This problem however was not present with the customers' side of data collection. The users rather enjoyed the testing processes, probably because they "liked the opportunity to judge" the products and services.

The time-based challenge with the user test process was with the computation and analysis of the tests. This process was tedious and time consuming. The use of Content Analysis however made this easier.

A lot of time was also spent understanding the statistical methods of analysis and their suitability for the research. Another problem faced in the collection of data was the geography. Though emails were sent to businesses all over the UK, the responses were few.

Since most of the networking had to be done in person, a lot of the contacts and responses were from the Midlands and London. This also led to the use of more service businesses than manufacturing businesses because they were more accessible. Efforts were made to get contacts from UXPA, however, they were unable to provide support in this area. There was also the financial constraint on traveling around the UK to get contacts, seeing as it was the most productive way of getting responses. This could have been managed better if the research was not self-funded.

Furthermore, the work only partially considered hard products, or situations where design is separated from responsibility for customer support. It is possible there could be novelty in these areas if researched.

7.6.2 The Framework

It was difficult to decide how the framework should be built or how it could work in achieving the aim of the research. The first version of the framework was unsuitable for measurement purposes, in that it poorly showed the relationships between the usability goal and strategies. The lack of prior research in the area contributed to the challenges faced, as there is not much literature discussing the user-experience strategies or strategy measurement. During the course of the research, expert opinions and guidance were sought, and a few faced difficulties understanding the difference between strategy measurement and strategy analysis, or the relevance of the research.

It was challenging to change perspectives on the applicability of usability outside computing, how usability principles can be used on a strategic level, and the difference between TQM and usability testing.

This was understandable, because customer-centricity and customer-experience strategies are relatively new, and since there is not much research on it, or any research relating usability to strategic measurement, they had limited knowledge on some of the areas discussed. Also, when developing the framework which had to be generic to both service and manufacturing businesses, there was the challenge of showing how the framework could be applicable to both areas, despite the difference in operations. However, it was explained that the differentiation comes in the nature of tasks given to users on which the framework could be used in measuring the user's experience.

7.7 Recommendations for Further Studies

Despite the depth covered by this research, there are more areas still to be explored. For reasons given in the previous section, some of these areas could not be explored in this research. This section identifies and discusses the importance of these areas of research.

7.7.1 Usability Issues

The research did not fully consider usability issues concerned with the design of hard products such as appliances and machines. This was an outcome of the research design. These hard products did not fall into the categories of best usability or worst usability after the pre-experimental usability studies. Further studies can be done to see how these products and businesses perform in terms of customer-centricity. Also, the research did not consider issues where responsibility for design is separated from responsibility for support. Further studies can be done to consider such scenario, where design and customer support could be integrated responsibilities. Further studies can also be done to determine the differences in usability performance targets between soft products, hard products, and agencies. In addition, further work could be done to explore how to develop an ethos of continuous feedback of customer satisfaction results, to feed forward into the design of products and services, and even the business structure. The outcome of these studies could supplement the results arrived at in this thesis.

7.7.2 Large Scale Behavioural Studies of more Products and Services

Due to certain constraints discussed in the previous section, the user tests in this research were limited. Small sample were used for data collection. Though this was suitable for this research, further research can be done to compare the experiences of customers across a wide range of organisations and sectors in the manufacturing and service industries. Further research could help assess the generalisability of the framework developed in this research to determine if it is suitable in other sectors outside those included in this research. Further studies could also be done in other countries as well to determine the differences in experience and requirements across these countries, and the factors that influence the difference in experiences. These studies could consider differences in product and service delivery cultures of businesses and how these cultures impact on customer experiences. Other usability testing methods other from think-aloud protocol user testing can also be evaluated to determine their efficiency in improving customer-centricity.

7.7.3 Training Employees for Improved Customer-Centricity

During the validation of the framework, there were comments on the need for employee performance management systems in order to achieve the kind of result expected from customer-centricity.

Although this is relevant, providing a means by which businesses could ready their employees for customer-centricity was beyond the scope of this research. Human resource is essential in being customer-centric and is possibly the most essential resource. Further research should be done to determine how employees could be trained to align with a company's image of customer-centricity, and achieve their customer-centric strategies.

7.7.4 Why Customer-centricity does not Guarantee Business Profits

It was found in this research that 50% of customer-centric organisations meet the industry average. It was suggested that the reasons why the other 50% do not could be because of poor implementation or misalignment. However, research in these areas would provide answers to this question. No doubt customer-centricity is good for business image and leads to increases in customer acquisition and retention.

However, since no direct relationship was found to the increase in profits, it is necessary to understand what customer-centric businesses could be doing wrong to not have guaranteed increase in their profits or decrease in cost.

7.7.5 Cost and Benefits of Customer-centricity

This continues from the previous suggestion for further studies. Customer-centricity could be a costly goal for businesses in terms of finance. However, the non-financial benefits are worth it. Further research should be done to determine exactly how costly customer-centricity is, what the cost centres are, and how they can be managed. This will also help provide a way for the non-financial objectives to be translated to financial results. Furthermore, studies can be done to provide detailed solutions to the individual customer-centric strategies identified in this research in the context of improving product development and service design.

7.7.6 Measurement of Non-Customer-centric Strategies

One of the gaps found in literature is the lack of data-driven strategy measurement tools. This research addressed this by providing a data-driven customer-centric strategy measurement tool. However, there is still the gap for non-customer-centric-identifying businesses who would like modern methods of measuring the appropriateness and outcomes of their business strategies. There are methods of measuring areas like financial performance and employee productivity.

There are some performance measures as well. However, in strategy studies, the use of models and frameworks provide a more in-depth analysis of the business performance.

7.7.7 Efficiency of the Strategic Choice Approach

The strategic choice approach was identified and assessed as the best decision support tool for selecting strategy tools for developing and measuring business strategies. This however was not tested in actual businesses. An in-depth research can be done to see the efficiency results that could be obtained from the use of the strategy choice approach.

7.8 Summary

In this research, a novel data-driven conceptual framework was developed to enable businesses improve their customer-centricity. The framework developed addressed the main research question, showing how usability can be included in a strategy measurement process for product development and service design. This chapter provided a summary and conclusion to the stages of this research. The research went through stages of literature review, data collection, analysis, evaluation, discussion, validation, and testing to ensure the framework that was developed could aid in providing positive customer-experience with businesses. The main research question 'to what extent can usability serve as a basis for customer-centric strategy measurement to help improve business performance' was achieved and demonstrated through the framework developed. The framework is based on the concept and principles of usability, and is aimed at enhancing business performance. It has been demonstrated that many customer-centric businesses are too inwardly focused, and tend to overlook the need for friendly and attractive products and services to improve customer experience. It has been demonstrated that usability targets can aid in improving customer experience. The areas of customer-experience and customer-centricity have been researched. Beyond the areas mentioned in this chapter, there are many opportunities for research to improve business performance for customer-centric businesses, and manufacturing and service companies.

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Appendices

<u>Appendix 1</u>: Questionnaire on Current Strategy Measurement Processes for Service Design and Product Development Employed in the Case Studies

	How is the appropriateness of strategies relating to product development and service design										
	measured in your organisation?	-		-			_				
	On a scale of 1 low – 5 high, please tick as appropriate		1	2	3	4	5				
a)	Resources required										
b)	Time span required										
c)	Competitive advantage										
d)	Change demand										
e)	Ability to meet success factors										
f)	Objectives										
g)	Right fit for the environment										
h)	Simplicity										
i)	Culture										
1.	How relevant are existing strategy measurement proc	esses in ir	nproving	service d	esign ar	nd pr	oduct				
	development in your organisation?										
2.	What do existing strategy measurement processes l	ack in im	proving s	ervice de	esign ar	nd pr	oduct				
	development in your organisation?										
3.	On a scale of 1 low – 5 high, please rate how each of these if used, are considered in strategy										
	measurement in your organisation. (please tick as appropriate)										
		2	3	4	5						
		Low					ign				
1.	Financial	Low					ign				
1. 2.	Financial Revenue growth	Low					lign				
1. 2. 3.	Financial Revenue growth Cost reduction	Low					lign				
1. 2. 3.	Financial Revenue growth Cost reduction Others	Low									
1. 2. 3.	Financial Revenue growth Cost reduction Others Customer	Low					lign				
1. 2. 3.	Financial Revenue growth Cost reduction Others Customer Retention	Low									
1. 2. 3. 4. 5.	FinancialRevenue growthCost reductionOthersCustomerRetentionCustomer acquisition	Low									
1. 2. 3. 4. 5. 6.	Financial Revenue growth Cost reduction Others Customer Retention Customer acquisition Customer-experience	Low									
1. 2. 3. 4. 5. 6.	Financial Revenue growth Cost reduction Others Customer Retention Customer acquisition Customer-experience Others	Low									
1. 2. 3. 4. 5. 6.	Financial Revenue growth Cost reduction Others Customer Retention Customer acquisition Customer-experience Others Internal Processes	Low									
1. 2. 3. 4. 5. 6. 7.	FinancialRevenue growthCost reductionOthersCustomerRetentionCustomer acquisitionCustomer-experienceOthersInternal ProcessesAttractiveness	Low									
1. 2. 3. 4. 5. 6. 7. 8.	FinancialRevenue growthCost reductionOthersCustomerRetentionCustomer acquisitionCustomer-experienceOthersInternal ProcessesAttractivenessFriendliness of use	Low									
1. 2. 3. 4. 5. 6. 7. 8. 9.	FinancialRevenue growthCost reductionOthersCustomerRetentionCustomer acquisitionCustomer-experienceOthersInternal ProcessesAttractivenessFriendliness of useValidation	Low									
1. 2. 3. 4. 5. 6. 7. 8. 9.	FinancialRevenue growthCost reductionOthersCustomerRetentionCustomer acquisitionCustomer-experienceOthersInternal ProcessesAttractivenessFriendliness of useValidationOthers	Low									
1. 2. 3. 4. 5. 6. 7. 8. 9.	FinancialRevenue growthCost reductionOthersCustomerRetentionCustomer acquisitionCustomer-experienceOthersInternal ProcessesAttractivenessFriendliness of useValidationOthersLearning and Growth	Low									
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	FinancialRevenue growthCost reductionOthersCustomerRetentionCustomer acquisitionCustomer-experienceOthersInternal ProcessesAttractivenessFriendliness of useValidationOthersLearning and GrowthInformation systems capability	Low									
1. 2. 3. 4. 5. 6. 7. 8. 9. 9. 10. 11.	FinancialRevenue growthCost reductionOthersCustomerRetentionCustomer acquisitionCustomer-experienceOthersInternal ProcessesAttractivenessFriendliness of useValidationOthersLearning and GrowthInformation systems capabilityKnowledge management	Low									
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.	FinancialRevenue growthCost reductionOthersCustomerRetentionCustomer acquisitionCustomer-experienceOthersInternal ProcessesAttractivenessFriendliness of useValidationOthersLearning and GrowthInformation systems capabilityKnowledge managementEmployee productivity	Low									

Appendix 2: Questionnaire on Theoretical Tools Currently Used in the Case Studies for Strategy Measurement



		-	Ι.				-
		0	1	2	3	4	5
		Stra	itegy I	Meas	urem	ient	-
		0	1	2	3	4	5
		If no	ot use	ed, pl	ease	indic	ate
		why	/ this	was	the	case	by
		tick	ing ar	ny of	the	opti	ons
		liste	ea.				1
		Una	ware				
		No	experi	ience			
		Not	appro	opriat	te		
		Tim	e cons	sumir	ng		
		Res	ource	issue	es		
		Oth	er				
c)	Customer Journey Map	Stra	itegy [Devel	opm	ent	
-	SETTING UP 👞 💏 FREGIMED 📂 DURINING	0	1	2	3	4	5
		Stra	tegy I	Meas	urem	ent	
	PRODUCT IS MESSING TO THE PRODUCT IS MESSING	0	1	2	3	4	5
		If n	ot use	ed, pl	ease	indic	ate
		why	/ this	was	the	case	by
		tick	ing ar	ny of	the	opti	ons
		liste	ed.				-
		Una	ware				
		No	experi	ience			
		Not	appro	opriat	te		
		Tim	e cons	sumir	ng		
		Res	ource	issue	es		
		Oth	er				
	INTERSTING BETTER PRIO OUT MORE						
d)	TOWS	Stra	itegy (Devel	opm	ent	
,	Strategic Business Planning for Commercial Producers	0	1	2	3	4	5
	Subtegic business Planning for commercial Producers	Stra	tegy I	- Meas	urem	ent	Ŭ
		0	1	2	3	4	5
	TOWS Matrix	If n	ot use	- d	ease	indic	ate
	(Prom External Analysis (EPAS)	why	/ this	was	the	case	by
	From Opportunities: Threats:	tick	ing ar	ny of	the	opti	ons
	(IFAS) 1. 2. 2.	liste	ed.				
	3. 3.	Una	ware				
	Strengths: SO Strategies 1. Use strengths to ST strategies Take advantage of Strengths to Strategies	No	experi	ience			
	2. take advantage avoid 3. of opportunities threate	Not	appro	opriat	te		
	WT Strategies	Tim	e cons	sumir	ng		
	Weaknesses: WO Strategies Defensive strategies	Res	ource	issue	es		
	3. overcome weaknesses weaknesses and avoid threats	Oth	ers				
	Source: Weihrich	C+	+0~		000	ort	
e)				Jevel	opm s		E
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				vieas	uren o		Г
		U	1	1 4	3	4	С

								If not used, please inc	licate
	\bigcap		Firm Infrast	tructure				why this was the cas ticking any of the or	se by
	Support	н	uman Resource	Management	3	\backslash		listed.	10113
	Activities		Technology De	velopment	10	najin l		Unaware	
			Procure	ment				No experience	
						7 /		Not appropriate	
		Inbound Opera	tions Outbou	nd Marketing	g Service	No.		Time consuming	
		Logistics	Logisti	cs And Sales	815	2		Resource issues	
								Others	
f)	VRIO (Valu		Strategy Development						
	VRIO Model			-				0 1 2 3 4	5
	Is valuable?	Is rare?	Is difficult	ls				Strategy Measuremen	t
			to imitate?	organization	What is the re	acult?		0 1 2 3 4	5
				around?	what is the re	esuit:		If not used, please inc	licate
							,	why this was the cas	se by
	NO				Competitive dis	SADVANTAGE		ticking any of the op	otions
						,		listed.	-
	YES	NO			COMPETITIVE EQUAL	lity / parity	-	No experience	
	YES	YES	NO	Te	MPORARY COMPETITIVE	ADVANTAGE	_	Not appropriate	
			_				-		
	YES	YES	YES	NO	Unused competitive	ADVANTAGE	-	Resource issues	
	VES	VES	VES	VES		ADVANTAGE		Others	
	115		11.5			ADVANIAGE		••••••	
					∭ [#] managi	jementmania.com			
g)	Personas							Strategy Development	
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	Nome Chris Simr	IS Tracy Irving	Teresa Vacaro	Mark Olson	Pete Vargas			If not used, please inc	licate
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	Occupation Gear Gear Gear Gear Gear Gear Gear Gear	opros Occupation. Student, Film & Seevacel Augur Gear: Mar OS X, Freitix, Phone Band,	Octoperon Ree Estas Agent Gear: Windows XP, E. Phone	Gear: Innovation Paris Benzes Film Gear: Innovat XP, Internet Depore, Broadband, Pare	Occupantin Adventing, Junio Desgner Gear: Windows XP, IE, Phone			listed	nons
	Outle I want to get things done and have better	be amarter, I'm blogging this. 198.	I'm no geek, but I love using the Inten for connecting with people, whether i via email and discussion groups or i	et Gotf is my passion. Knowledge is my occupation. With regard to technolog at keep it simple or I won't use it.	I work hard, so the web is an entertainment outlet for me-it's my TV.			Unaware	
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					listed.								
					Unawar	е							
	Cost	Bene	fit		No expe	rience)						
					Not app	ropria	te						
		-			Time co	nsumi	ng						
		Grea	ter		Resourc	e issue	es						
		Incol	me		Others								
	New	Fast	er										
	equipmen	operati	ions										
	Track												
	iraining	Training Less waste											
••					<u>.</u>	_							
1)	Porters Generic				Strategy	Deve	lopme	nt	-				
		Adva	ntage		U I	2	3	4	5				
	Target/Market		De la Maria		Strategy		ureme	ent	-				
	Scope	Low Cost	Product/Service		U I		3	4 India	5				
			Uniqueness		why thi	seu, pi s was	the d	nuic	hv				
						any of	f the	opti	ons				
	Broad	Cost Leadership	Differentiation		listed.	. , .							
	(Industry Wide)	Strategy	Strategy		Unaware								
	(No experience								
		Not appropria											
					Time co	nsumi	ng						
	Narrow	Narrow Focus Strategy Focus Strategy				ce issues							
	(Market Segment)	(low cost)	(differentiation)	Other									
j)	Bowman's Clock				Strategy	/ Deve	lopme	nt					
		Differentiation			0 1	2	3	4	5				
	High	4	Forward		Strategy	/ Meas	urem	ent					
	Hybrid (3		Differentiation		0 1	2	3	4	5				
			\		If not u	sed, pl	ease i	ndic	ate				
	Low C		Bicky		why thi	s was	the o	case	by				
	Price 2	6	High margins		ticking	any of	f the	opti	ons				
			/		listed.								
	Low price		lonopoly		Unawar	e							
	& low added value	8	pricing		Not app	ropria	: to						
	Low	Loss of market share			Time co	nsumi	ng						
	Low	Price	High		Resource								
			10101° 20		Others	e issue	55						
					others								
k)	Ansoff				Strategy	v Deve	lopme	nt					
					0 1	2	3	4	5				
					Strategy	/ Meas	ureme	ent					
					0 1	2	3	4	5				



		CORPORATE STRATEGY MAP	If not used, please indic	ate		
	Financial	Long Term Starrholder Value	why this was the case	by		
		Revenue Growth	ticking any of the option	ticking any of the options		
	Customer	Inconcisive Product Octomer Experience Reliable Delivery Value Err Morey	listed.			
	customer		Unaware			
	Teterral	Internation Internal Product On Ontimize Sales One Periode	No experience			
	Internal	Partneship Development Channels Just-In-Time Manufacturing	Not appropriate			
		Stable High Talent Orthogonal Statling Workforce Qustomes StableRs	Time consuming			
	Learning & Growth		Resource issues			
		Technologies	Others			
	Strategic themes	Generate Growth Through Innovation Enhance Customer Experience Create Operational Excellence				
2.	If you	used a strategy tool in your organisation, which gave the greatest	benefit, and why?			
3.	Please	list any other tool used by your organisation in developing strate	gies for product developme	ent		
	and se	rvice design, and why the tool was used.				
	Tools	Reasons				
a)						
b)						
c)						
d)						
4.	Please	describe challenges faced in the measurement of strategies for	or product development a	and		
	service	e design using any of these tools				
a)	Irreleva	ance				
b)	Time c	onsuming				
c)	Exclud	es important measures				
	Other					

Appendix 3: Questionnaire on Assessment of Innovation

	Please Tick as Appropriate	Yes	No
1.	Over the past three years at least one new process has been used for product development or service design in your organisation		
2.	Over the past three years at least one new product has been proposed to the market by your organisation		
3.	Over the past three years, at least one product has been improved by your organisation		
4.	Over the past three years at least one new process used for products has been optimised or improved by your organisation		
5.	Over the past three years your organisation used new technology for its products or services		
6.	Your organisation invests at least 10% of annual returns on research and development		
7.	Your organisation considers future market needs when developing strategies for product or process innovation (such as changes in customers wants, competition, substitute products, new entrants)		
8.	Formulating innovation strategies increases our employee skills		
9.	Formulating innovative strategies increases our annual profit		
10.	Innovative strategies increase our customer acquisition		
11.	Innovative strategies increase our customer retention		
12.	Our technological capabilities are top class		
13.	The success of Research and Development activities in your organisation is based on long-term know-how		
14.	External threats affecting successful innovation are effectively identified in your organisation		
15.	External threats affecting successful innovation are effectively managed by matching available internal resources in your organisation		
16.	Of the above, which of the top 3 in terms of greatest impact on innovation in your organisation, and why		

Appendix 4: Questionnaire on Assessment of Knowledge Management

KNOWLEDGE	MANAGE	MENT							
Knowledge N	Aanagemer	nt is a discipline that promotes an integrated approach to identifying,							
capturing, evaluating, retrieving, and sharing all an enterprise's information assets, expertise, and									
skills									
Please Tick as Appropriate									
CREATION	1.	Your organisation ensures that previous employees adequately							
		introduce new employees to design processes							
	2.	Various knowledge sources (such as databases) are administered by							
		your organisation to allow employees search for information relating to							
		product design							
USE	3.	Knowledge is shared throughout your organisation to all relevant							
		employees for use							
STORE	4.	We try to store expertise on new tasks design and development in your							
		organisation							
	5.	We document customer and task-related databases to obtain							
		knowledge necessary for the tasks in your organisation							
SHARING	6.	We developed information systems, like intranet and electronic bulletin							
		boards, to share information and knowledge and improve task efficiency							
		in your organisation							
LEARNING	7.	Our employees are given educational opportunities to improve							
		adaptability to new tasks							
	8.	Knowledge made available for use throughout your organisation are							
		updated regularly and maintained well							
REUSE	9.	It is easy to extensively search through customer and task related							
		knowledge documents from databases for reuse in your organisation							
	10.	Effective knowledge management increases our employees' skills on							
		handling tasks							
	11.	Effective knowledge management increases our annual profit							
	12.	Effective knowledge management increases customer acquisition in							
		your organisation							
	13.	Effective knowledge management increases customer retention in your							
		organisation							
	14.	Of the above, which of the top 3 in terms of greatest impact on							
		knowledge management in your organisation, and why							

Appendix 5: PACT Analysis

5.1 People

For this research, the purpose of analysing the people that make use of the various products and services is to aid in determining the sample characteristics for the user tests. Based on principles by Benyon et al. (2005), the analysis includes:

- 1. Psychological Characteristics such as:
- Cognitive characteristics -level and duration of attention, perception, memory, learning abilities, cognitive capabilities, fears, and personality characteristics
- Physical Characteristics Age differences, physical abilities, gender special needs - blindness, colour blindness, deafness, and wheel-chair users
- 3. Education and Language of users, as well as experience, inform of Culture in terms of what customers are used to, and Discretionary vs committed users. If users are not committed, they need to be encouraged to return
- 4. Usage Differences such as Homogenous vs heterogeneous user groups, and Infrequent vs frequent users are also assessed

5.1.1 Psychological Characteristics

In the UK academic sector, both individuals with either psychological disabilities or none are accepted into UK universities (Pasques et al. 2016). This allows both short attention and long attention spanned students. Students also either have a positive or negative perception of universities based on willingness to learn (Haris 2013). Considering universities aim to ensure equality, students with learning disabilities are also accepted (Bebbington 2009). Also, students of all personality characteristics are sure to be represented in UK universities (Pasques et al. 2016). This is also like individuals that make use of retail store services. Services are open to all individuals irrespective of psychological disabilities and personal characteristics (Thompson 2011). Telecommunication services (Adekola and Sergi 2007), healthcare services (Myers and Jason 2010), banking services; food (Coller 1998; Wieserman 2016), cosmetics (Hill 2016), mechanical products (MMS1 2017), electronics, and cars, are accessible to all individuals, and therefore should be usable to all, despite their psychological characteristics.

5.1.2 Physical Characteristics

For the academic sector in the UK, undergraduate students are a minimum of 17 years in most UK universities, and an average maximum of 25, which is not a mandatory stipulated age (UKHES 2017). Postgraduate students are aged up to 45, but could be higher. UK universities are not gender specific, accepting both male female, transgender and every other time of gender (Bebbington 2009). Individuals with and without disabilities are also accepted in UK Universities (Pasques et al. 2016). This includes physical and psychological disabilities. Physical disabilities such as blindness, deafness, and wheel chair users, etc. psychological disabilities such as dyslexia. There is no age restriction on individuals that can access retail stores. Similarly, there is no age restriction on individuals that can access telecommunications services (Adekola and Sergi 2007). Retail services and telecommunications are available to all individuals despite physical abilities or inabilities (Healy 2011). Some retail stores offer gender specific products, considering the products being sold, however, all individuals can access the services. Individuals with all types of special needs also access retail store services. There is no age restriction on individuals that can access healthcare services. Healthcare is available to all individuals despite physical abilities or inabilities (Myers and Jason 2010). Some healthcare services are gender specific for instance care for women. Some are specific to children and the elderly. Considering the different fields of medicine, healthcare is provided based on the different needs of the individual. Individuals with all types of special needs also access health care services (World Health 2010).Bank services are usually available to individuals 18 and above. Some services however are available for student 16-18, and some are available for children but operated by adults on their behalf till a certain age. Bank services are available to all adults despite physical abilities or inabilities. Some Individuals with all types of special needs also access bank services (Diley 2008). There is no age restriction on individuals that can access manufactured food (Wiesermann 2016). Food is available to all individuals despite physical abilities or inabilities. Some types of food are manufactured to suit needs of different groups such as vegetarians, babies, diabetics, nursing mothers, pregnant women, etc. Individuals with all types of special needs also access food (Hill 2016). There is no age restriction on individuals that can access some cosmetics. However, some cosmetics are only purchased and used by adults and young adults. Cosmetics are available to all individuals despite physical abilities or inabilities, but are used by women. Some types of cosmetics are manufactured to suit needs of different skin types.

Individuals with all types of special needs also access cosmetics (CMS1 2017). Mechanical products can only be purchased and used by adults and children above a certain age (Hill 2016). Mechanical products are available to all adults, however heavy machinery cannot be used by certain groups such as some physically disabled groups, pregnant women, and the elderly. Some types of mechanical products are manufactured to suit needs of different organisation and individual needs, such as logistics companies, aerospace organisations, manufacturing companies, etc. There is no age restriction on individuals that can use most electronics; however, some electronics are restricted from use by children (Hill 2016). Electronics are available to use by all individuals despite physical abilities or inabilities. Individuals with all types of special needs use electronics (Hill 2016). Cars can be purchased and used by individuals with some types of special needs cannot drive cars, for instance individuals with challenges with their sight (CMS1 2017).

5.1.3 Experience

In the UK academic sector, there are both discretionary and committed students. Some students are committed to learning, others feel they have a choice to not learn, those are the discretionary users (Fry 2015). These students need to be encouraged to make use of learning facilities and support (Benyon et al. 2005). Students are motivated by success, fun, and engaging activities. Some students are somewhat experts, and some could be said to be novices, however, there are no students with low level intelligence, just students that lack motivation to learn (Butin 2005). Therefore, experiences and expectations are different (Benyon et al. 2005). Considering the different backgrounds, some students are used to other teaching methods than those used in UK universities. There are also discretionary customers that need to be encouraged to return to use retail services, and committed users as well (Benyon et al. 2005). Customers are mostly motivated by rewards, affordable prices, and reduced prices. Customers expect to find all the products they require in the store or online, and do not like delays. They also like good customer service. Considering culture, retail stores are organised with similar format, ensuring that directions and labels are in place (Schell 2006). In telecommunications, there are mostly committed users, considering individuals do not switch providers daily (Shaw 2000). Customers are mostly motivated by rewards, affordable prices, and reduced prices (Schell 2006). Customers expect to find all the products they require in the store or online, and do not like delays. They also like speed in the network as well as service delivery. They also like good customer service (Shaw 2000). In healthcare, there are also discretionary customers that need to be encouraged to return to use the services, and committed users as well (Benyon et al. 2005). Commitment to a provider in the UK might not be based on choice, given the nature of healthcare in the UK by NHS (Collins 2007). However, with private healthcare, the situation differs. Customers are mostly motivated by affordable prices, and reduced prices (Shaw 2010). Customers expect good service. Considering culture, patients might find health care process, especially public health care, different from what is provided in other countries. In banks, there are also discretionary customers that need to be encouraged to return to use the services, and committed users as well. Customers are mostly motivated by rewards, and lower interest rates (Diley 2008). Customers expect to find all the products they require in the store or online, and do not like delays. They also like good customer service. In food manufacturing, cosmetics, automotive, mechanical, and electronics manufacturing, there are discretionary customers that need to be encouraged to return to use the products, and there are committed users as well (Benyon et al. 2005). This depends on preference of the customers, and difference in expectations. Customers are mostly motivated by affordable prices, and reduced prices (Shaw 2010). Customers expect to find all the products they require in the store or online, and do not like delays. They also like good customer service.

5.1.4 Education

In the academic sector, the educational level attained at secondary school is generally 'A' level, for undergraduate students, BSc for post graduate taught, MSc for post graduate research (Race 2013). Customers could be educated and uneducated in retail healthcare, telecommunications, banking, food, mechanical, cosmetics, electronics, and automotive sectors.

5.1.5 Language

The individuals that make use of academic, retail, healthcare, banking, food, cosmetics, mechanical, electronics, and automotive products and services are from various nationalities and speak different languages though residing in the UK (Myers and Jason 2010; Thompson 2011). However most have at least a basic understanding of English (Shaw 2010).

5.1.6 Usage Differences

The universities offer short courses, distance learning, an on-campus learning. They offer post graduate taught, post graduate research, and undergraduate courses Haris 2013). These courses are in science, social science, and art disciplines (Pasques et al. 2016). The universities offer full times and part time courses, making users frequent and infrequent, making it necessary for the services provided to be helpful in ensuring users do not forget how to complete tasks (Benyon et al. 2005).

Retail store users are heterogeneous, meaning there are many different types of people that make use of retail store services (Benyon et al. 2005). There are also frequent and infrequent users, depending on the quality of services or the needs of the customers (Taniguchi 2006). Users of telecommunications are both homogeneous and heterogeneous (Adekola and Sergi 2007). The homogeneous users consist of the many different types of individuals that make use of telecoms services (Benyon et al. 2005). Homogeneous users are for instance the users of intranet in an organisation. Users of telecoms services are usually frequent because the services are used over a long period of time (Shaw 2000). Users of health care services are homogeneous. The homogeneous users consist of the many different types of individuals that make use of the services (Myers and Jason 2010). Users of healthcare services are usually frequent and infrequent. Some individuals require regular check-up, and need to visit the services regularly, while others go in occasionally. Users of bank services are homogeneous. The homogeneous users consist of the many different types of individuals that make use of the services. Users of bank services are usually frequent. Customers make use of banks services regularly as required. Users of food manufactured in the UK are both homogeneous and heterogeneous. The homogeneous users consist of the many different types of individuals that make use of the products, and the heterogeneous groups include groups such as vegetarians, children, pregnant women, etc. Users of food produced are usually frequent and infrequent. Some individuals make use of some products regularly, and some use it occasionally (Hill 2016). Users of cosmetics manufactured in the UK are heterogeneous. The heterogeneous group is made up of women, as med do not generally use cosmetics. Users of cosmetics produced are usually frequent as women make use of cosmetics daily (Hill 2016). Users of mechanical products in the UK are both homogeneous and heterogeneous. The homogeneous users consist of the many different types of individuals that make use of the products, and the heterogeneous groups include groups companies that make use of products specific to their needs such as logistics companies. Users of mechanical products are usually frequent and infrequent. Most organisations make use of some products regularly, and some individuals use it once in a while. Users of electronics manufactured in the UK are homogeneous. The homogeneous users consist of the many different types of individuals that make use of the products. Users of electronics produced are usually frequent and infrequent. Some individuals make use of some products regularly on a day to day basis, for instance mobile phones, and some use it once in a while, for instance sandwich makers. Users of cars manufactured in the UK are homogeneous. The homogeneous users consist of the many different types of individuals that make use of the cars. Users of cars produced are usually frequent, as they are used regularly on a day to day basis (Hill 2016).

5.2 Activities

Based on principles by Benyon et al. (2005), activities are analysed based on:

- 1. Temporal aspect which means how frequent a certain activity is performed;
- 2. Co-operation which deals with if the activities can be carried out alone or if you have to do it together with others;
- 3. Security Critical which covers the area of if a mistake is done if it could result in an accident or some sort of injury, and;
- 4. The nature of the content which means that you consider the data requirements of the activities made.

According to Nielsen (2014), these activities identified will enable the development of task scenarios for usability testing based on the user goals identified in this section.

5.2.1 Activities

The activities were deduced from business websites. Following research for each of the sectors, typical and routine activities are identified in the table below.

Table 60: Activities

Sector

Academic

Classroom Online Societies Club General Activities Unions Library Support Accommodation

Registry Sports/gym Employment Assessment

	Finance/Funding	Healthcare	Emails and communication
	Lab	Relaxation	
	Рау	Search	Order
Retail	Credit	Information	Returns
	Locate	Discounts	Support
	Purchase	Broadband	Discounts
	Cancel	TV	Search
Telecommunications	Support	Mobile phones	Credit
	Order	Tariff	Upgrade
	Delivery	Access account	
	Consultancy	Maternity	Nursing
Hoalthcaro	Emergency care	Surgery	Tests
Treattricare	Specialities	Pharmacy	Admissions
	Payments	Aftercare	
	Current accounts	Loans	Security
	Saving	Online banking	Business banking
Pank	Debit card	Mobile banking	Deposit
Dalik	Credit cards	Alerts	Transfer
	Mortgage	Statements	Withdrawals
	Support		
Food Manufacturing	Eat	Рау	Support
	Cook	Locate	Information
Cosmetics	Apply	Рау	Information
cosmetics	Support	Locate	
	Use	Exhaust systems	Locate
Mechanical	Support	Fuel systems	Fix
Wiechanica	Information	Engine components	Install
	Рау		replace
	Mobile phones	Support	Organise
	Locate	Information	GPS
Flectrical	Рау	Call	Exchange
Licethear	Email	Text	Wi-Fi
	Media	Social media	Turn on/off
	Apps	Time/date	Security
	Support	Рау	Video system
	Information	Locate	Entry
Automotive	Storage	Drive	GPS
Automotive	Engine	Car seat	Radio
	Heating	Fuel	Aux
	Spare tyre	Gear	

5.2.2 Temporal

In the academic sector, classroom and online learning are regular, therefore should be easy to do. The other tasks should be easy to learn and remember because they are not regular. Getting support on each activity online or in person requires short length of time and fast response. Retail stores are mostly visited weekly or monthly, and for some, quarterly or even yearly. Therefore, it should be organised in a manner that makes tasks easy to do for frequent users, and easy to learn and remember for infrequent users. It involves multitasking in some cases, but mostly serial tasking. Length of time on tasks is expected be short in some cases that do not involve actual shopping, such as payment, ordering, getting support, or searching for products. Interaction with telecommunications organisations is hardly frequent, because once a customer is satisfied with services; all that is done regularly is payment. Therefore, it should be organised in a manner that makes tasks easy to learn and remember. Length of time on tasks is expected be short especially in payment, ordering, getting support, or searching for products. Interaction with healthcare is sometimes weekly or monthly, and for some, quarterly or even yearly. Therefore, it should be organised in a manner that makes tasks easy to do for frequent users, and easy to learn and remember. Length of time on tasks is expected to be short especially in getting appointments, or getting support. Interaction with banks is sometimes weekly or monthly, and for some, quarterly or even yearly. It is daily most times in when making payments. Therefore, it should be organised in a manner that makes tasks easy to do for frequent users, and easy to learn and remember. Length of time on tasks is expected to be short especially in payment, ordering, getting support, or searching for products. Interaction with food, cosmetics, electronics, and cars is sometimes weekly or monthly, and for some, irregular.

Therefore, it should be organised in a manner that makes it easy to use for frequent users, and easy to learn and remember. Length of time on tasks is expected to be short especially in use, payment, ordering, getting support, or searching for products. Interaction with mechanical products is mostly irregular. Therefore, it should be organised in a manner that makes it easy to learn and remember. Length of time on tasks is expected to be short especially in use, payment, ordering, getting support, or searching for products.

5.2.2 Individual Vs Co-Operative Work

In the academic sector, learning is both individual and in some cases cooperative. Some activities might require cooperative work such as clubs, societies, assessments, and sports.

However, others are individual. Communication is required in all the activities. In the retail, telecommunications, and health sectors, food manufacturing, mechanical, automotive, cosmetics, and electrical sectors, some activities are individual such as payment and searching for products. Other activities require cooperation as communication is required in all the activities. In the banking sector, some activities are individual such as payment and searching for products. Other activities are individual such as online banking, mobile banking, and searching for products. Other activities require cooperation as communication is required in all the activities.

5.2.4 Security Critical

In the academic sector, there is no risk of anyone getting injured by making a mistake, except with the use of gym, and use of stairs in buildings. However, there are online security risks. In healthcare, retail, telecommunications, and banking sectors, there is no risk of anyone getting injured by making a mistake except if there's a spill in store. However, there are online security risks. In food manufacturing, there is no risk of anyone getting injured by making a mistake except if there's a spill in store. However, there are online security risks. In food manufacturing, there is no risk of anyone getting injured by making a mistake except if there is missing information in the ingredients which could cause allergic reactions, or choking on the food. In cosmetics manufacturing, there is no risk of anyone getting injured by making a mistake except there is a reaction to the product, or if it gets to the hands of underage. In mechanicals, there are risks of getting injured by making a mistake escept of the size of the products. In electrical, there is the risk of getting electrocuted, of an individual injured by a large product. With cars, it is possible to get injured by in an accident.

5.2.5 Nature of Content

The major activities in the university are continuous, such as Classroom, Lab, Library, Support, Accommodation, and Assessment. Other functions are interrupted such as Societies, Club, Finance/Funding, Unions, Healthcare, Registry, Sports/gym, and Employment. The students may need to find their place again as they do not use these activities regularly. In retail, Shopping is not a regular activity, as it is not done daily. For some it might be weekly and others monthly. Most individuals do not shop at all the same stores all the time. The organisation of the stores should allow users to find their place again when they return. In telecommunications, most interaction is done on websites and over the phone than in person. The structure of finding products, getting help, accessing accounts, and making payments is not continuous, therefore should be organised in a way that customers will find their place when they return to perform these activities. In healthcare, patients have little impact on the nature of content. Appointments are booked over the phone by the hospitals, or given to the patients by mail. In banks, most interaction is done on websites and over the phone than in person. The structure of finding products, getting help, accessing accounts, and making payments is continuous. There is some interaction in person; however, it is not regular as more people make use of online and mobile banking. In food, cosmetics, electronics, and mechanical manufacturing, use is continuous. In automotive, usage is mostly continuous, but sometime interrupted. Users will sometimes have to remember how some controls work, or how to drive the car.

5.3 Context

Based on principles by Benyon et al. (2005), the analysis of the context includes:

- 1. Physical Environments: noisy, cold, wet, dirty, stressful, uses dangerous materials, sunny
- 2. Social Environments: channels of communication, structure, centralisation vs decentralisation, home, mobile, training materials
- 3. Organisational Context: relationships with customers, other staff, effect on work practices and job content, role, deskilling, job loss, shift in power
- 4. Circumstances under which activities happen: time, place, pressure of work/time
- 5. Amount and Type of Support for Activities: tuition, manuals, demonstrations, new knowledge, new skills

5.3.1 Physical Environments

In the academic sector, most of the activities require physical presence of the students, but also could be carried out on the internet on various platforms. Classroom learning though requiring presence of the students includes online activities as well. Support for finance, healthcare, registry, can be obtained online, but can also be gotten in person at the various offices. The environments are not usually noisy, nor cold, or wet. Neither are they dirty. However, some students might find learning for over 2 hours stressful, or queuing for support considering the wait time to get a response online. Retail shops can be noisy depending on the size of the shops and the number of customers that visit. This however is not rampant. Retail shops are neither wet, nor cold, and are not expected to be dirty. The possibility of activities being stressful depends on the individual and the effectiveness and efficiency of the retail service. Materials required for shopping are not dangerous. Telecommunications organisations are not usually noisy. They are neither wet, nor cold, and are not expected to be dirty. The possibility of activities being stressful depends on the activities the individuals undertake, and the effectiveness and efficiency of the organisation. However, most activities are done online. Health care organisations can be noisy at receptions depending on the number of customers that visit, and the size of the hospitals. Healthcare organisations are neither wet, nor cold, and are not expected to be dirty. The possibility of activities being stressful depends on the individual and the effectiveness and efficiency of the healthcare organisation. Materials required for shopping are not dangerous. Banks can be noisy depending on the size of the bank and the number of customers that visit. Banks are neither wet, nor cold, and are not expected to be dirty. The possibility of activities being stressful depends on the individual and the effectiveness and efficiency of the banks. Materials required for banking are not dangerous. Food, cosmetics, mechanical, cars, and electronic products come in various physical forms. The possibility of activities being stressful depends on the individual and the effectiveness and efficiency of the design and distribution. Electronics can be used for various purposes including work, fun, daily use. Cars can be used at any time of the day to any destination including work, errands, taxi.

5.3.2 Social Environments

In the academic sector, channels of communication for most activities are either in person or emails. There are also posts on the portal, or posters around campus. The use of gadgets allows access to these forms of communications. In retail, telecommunications, banks, food manufacturing, cosmetics, mechanicals, electronics manufacturers, and car manufacturers, communication occurs in person with sales attendants and on phone with customer care representatives and via email as well. Considering emails are involved, and online shopping, all mobile platforms are expected to allow access to websites and online tasks for banks, considering emails are involved, and online banking, all mobile platforms are expected to allow access to websites and online tasks. In healthcare, communication occurs in person with receptionists, and medical professionals, and on phone with receptionists as well, and via email as well. Considering emails are involved, and all mobile platforms are expected to allow access to websites and online tasks.

5.3.3 Organisational Context

In the academic sector, students get to associate with their colleagues during lectures as part of the learning requirements to engage the students. Staff of retail stores, telecommunication sector, healthcare organisations, banks, food manufacturing, cosmetics manufacturing, automotive, and electronics manufacturing are expected to be friendly but professional when relating with customers.

5.3.4 Circumstances under which activities happen

In the academic sector, formal learning occurs from 9 am to 7 pm. Informal learning can occur at whatever time comfortable for the students as they have access to library books online and course hand-outs as well. Other activities requiring meeting others in person usually occurs within working hours of 9 to 5, however emails can be sent anytime but will usually be responded to within working hours. Most retail stores open at 8am-9am, and close from 6 pm to 11 30 pm. This also relates to communication via phone. Online shopping can be done at any time of the day. Returns can be done during working hours, as it is not usually directly associated with the retail stores. Most telecommunication stores open at 8am-9am, and close at 5pm. This also relates to communication via phone in some cases, while some have 24/7 response. Online shopping can be done at any time of the day. Returns can be done during working hours, as it is not usually directly associated with the retail stores. Some healthcare organisations open at 8am-9am, and close from 6 pm to 11 30 pm. This also relates to communication stores open at 8am-9am, and close from 6 pm to 11 30 pm. This also relates to communication stores. Some healthcare organisations open at 8am-9am, and close from 6 pm to 11 30 pm. This also relates to communication via phone. Bigger hospitals are usually open 24/7. Banks usually open at 8am-9am, and close at 5 30 pm. This also relates to communication via phone for general enquiries. Online banking can be done at any time of the day.

Food can be purchased any time of the day stores are open, or purchased online. When purchased, they can be consumed whenever the individual feels like. Cosmetics can be purchased any time of the day stores are open, or purchased online. When purchased, they can be used whenever the individual feels like. Mechanical appliances can be purchased any time of the day stores are open. When purchased, they can be used whenever the individual feels like. Electronics can be purchased any time of the day stores are open, or ordered online. When purchased, they can be used whenever the individual feels like. Electronics can be purchased any time of the day stores are open, or ordered online. When purchased, they can be used whenever the individual wishes to. Cars can be purchased any time of the day stores are open. When purchased, they can be used whenever the individual wishes to.

5.3.5 Amount and Type of Support for Activities

In the academic sector, students require research materials which are provided on different media online including library and portal. Information on how to access different departments or for different processes is available online as well, with phone numbers and contact details. In retail, telecoms, banks, healthcare, banks, food manufacturing, cosmetics manufacturing, mechanicals, electrical, and automotive manufacturing, information can usually be found on websites or obtained from staff in store, on the phone or via email. In healthcare, it can be obtained from receptionists and secretaries as well.

5.4 Technologies

The analysis of the technologies basically aims at

- 1. Input: how users get data in, how users get commands, security, safety critical systems, and the user interface
- 2. Output: the characteristics of different displays (e.g. Video vs. Photographs; speech vs. screen), Sound, Size of screen, and Walk-up-and-use systems such as kiosks
- 3. Communications: between people, between devices, speed, etc. What is connected to what? Content, Real-time systems, always on or dial in? Networked or standalone

5.4.1 Input

In the academic sector, technologies provided by universities to enable students get data in include university portals, and computers on site. Students are given their own user log in detail, and use passwords to ensure privacy. For retail stores, some stores have monitors that enable customers search for products. Technology to enable payment for products through self-checkout is also provided by some stores. For online purchases, some stores have websites that allow customers place orders, arrange delivery, and arrange returns. Security is ensured by these online stores and in store to keep the customers protected. Most transactions with telecommunications organisations and customers occur online. They have websites that allow customers find information, place orders, arrange delivery, and seek support. Security is ensured to keep the customers protected through certain ways such as providing account details unique to a customer. In health care organisations, there are monitors that enable patients book appointments. This can also be done online on websites. Security is ensured by NHS by providing individuals with unique numbers. Banks make use of a number of technologies such as ATMs, faster deposit machines, POS, internet banking, and mobile banking. Customers have their log in details and can access their personal internet banking and mobile banking. Food does not necessarily require technology for use, except if it is to be cooked. This however is not technology provided by the manufacturers. Some food products are made ready to eat, some might require to be microwaved for a few minutes, and some might need to be cooked for a long time. Technology however is required in the stores where they are purchased. Similar to food products, all cosmetics do not necessarily require technology for use. Technology however is required in the stores where they are purchased. Some mechanical products usually come with some form of technology depending on the product in question. Technology however is required in the stores where they are purchased. Electronic products also usually come with different types of technology depending on the manufacturer. Technology is also required in the stores where they are purchased. Cars usually come with technology, which varies depending on the product in question. Technology however is required in the stores where they are purchased. Apart from the basic requirements of a car, they also come with GPS, heating, video systems, etc.

5.4.2 Output

In the academic sector, Students can get information or carry out activities on these technologies provided, accessing various displays such as videos, texts, speech, sound, and pictures. Most of the technologies provided by university are software rather than hardware, except the computers provided on site or attendance monitors. The computers are walk-up-and-use systems. Students can however access the websites and applications remotely.

In the retail, bank, food manufacturers, mechanical, cosmetics manufacturers, electronics manufacturing, automotive manufacturers, and telecommunications sectors, for online purchases, the stores' websites should be accessible on all mobile platforms and computers, allowing all form of text and multimedia, despite the size of screen. The self-checkout monitors in store are walk-up-and-use systems. For the banking sector, mechanical, cosmetics manufacturers, electronics manufacturers, and automotive manufacturers' technologies in the banks are walk-up-and-use systems. In the healthcare sector, websites should be accessible on all mobile platforms and computers, allowing all form of text and multimedia, despite the size of screen. The check-in monitors in health care organisations are walk-up-and-use systems.

5.4.3 Communications

In the academic sector, Communication between students and staff, and students and colleagues are ensured on the platforms identified in the input and output sections. Being online based, the students only require a network connection, and log in details. This applies to learning, library, getting support, etc. In the retail, banking, food manufacturing, mechanical, electronics manufacturing, automotive, cosmetics manufacturing, and telecommunications sector, communication between customers and staff if not in person is facilitated through emails, and phone calls. The self-checkout serves as an additional support for customers. All systems in store or online are linked to the stores central unit.in the banking sector however, the self-deposit machine and ATM serves as an additional support for customers. In the healthcare sector, Communication between patients and staff if not in person is facilitated through emails, and phone calls. Based on the analysis, a sample of people and tasks used for the research, for each sector are developed and listed in the next section. This is used in the next section for user test.

	ΤοοΙ	Environment	Complexity	Туре	Developer	Year	Industry Applicable	Description
1.	3-C Framework	Competitive Strategy	Medium	Model	Kenichi Ohmae	1991	Manufacturing and Service	Analyse marketing strategy triangle- company, customer, and competitors.
2.	4 PS Of Marketing (Marketing Mix)	Internal	Low	Framework	Neil Borden	1953	Manufacturing and Service	To determine a product or brand's offer, and is often associated with the four p's: price, product, promotion, and place.
3.	ADL Matrix	Micro	Medium	Matrix	Arthur D Little Consulting Company	1980s	Manufacturing and Service	To Determine the impact of industry's maturity and competitive position on strategy.
4.	Alien Eye Analysis	Micro and Internal	Medium	Model	Edie Weiner	2005	Manufacturing and Service	Analyse existing products, industry and company with new vision to avoid blind spots.
5.	Ansoff Growth Strategy Matrix	Strategic Choice	Low	Matrix	Ansoff	1957	Manufacturing and Service	Matching up existing and new products and markets
6.	Balanced Business Scorecards	Strategy Implementation	Medium	Matrix	Kaplan and Norton	1992	Manufacturing and Service	Financial measures of an organisation and key non- financial measures relating to customers or clients, internal processes, and organisational learning and growth need
7.	BCG Matrix	Internal	Low	Matrix	Haspeslagh	1982	Manufacturing and Service	How a company should think about its portfolio based on relevant market share and market growth rate
8.	Benchmarking	Strategy Implementation	High	Template	Unknown		Manufacturing and Service	Adoption of identified best practices should improve performance
9.	Blue Ocean Strategy	Competitive Strategy	Medium	Graph	W. Chan Kim and Renée Mauborgne	2005	Manufacturing and Service	Identify untapped market opportunities
10.	Boston Box/BCG Matrix/Product Portfolio	Internal	Medium	Matrix	Boston Consulting Group By Bruce D. Henderson	1970	Manufacturing and Service	Assessing your firm's position relative to others in terms of its product range. It is a 2×2 matrix, plotting market share against market growth.
11.	Bowman's Clock	Strategic Choice	Low	Graph	Cliff Bowman and David Faulkner	1996	Manufacturing and Service	Extends porter's three strategic positions to eight, and explains the cost and perceived value combinations many firms use, as well as identifying the likelihood of success for each strategy
12.	Business Model	Competitive	Medium	Matrix	Alex	2010	Manufacturing	Analyse current model

Appendix 6: List of Strategic Analysis Tools

	Generation	Strategy			Oesterwalder		and Service	
13.	Competitive Profile Matrix	External	Medium	Matrix	Unknown		Manufacturing and Service	Compares the firm and its rivals and reveals their relative strengths and weaknesses
14.	Core Competence Analysis	Internal	High	Model	Prahalad and Hamel	1990	Manufacturing and Service	Core competence analysis
15.	Corporate Parenting Matrices	Internal	Low	Matrix	Unknown		Manufacturing and Service	Summarizes the various judgements regarding corporate/business unit fit for the corporation as a whole
16.	Cost Benefit Analysis	Internal	Medium	Formula	Unknown		Manufacturing and Service	Systematic approach to estimating the strengths and weaknesses of alternatives that satisfy transactions, activities or functional requirements for a business
17.	Cost Structure Comparison	Internal	High	Table	Unknown		Manufacturing and Service	Identify and calculate differences in competitors' costs
18.	Customer Relationship Management	Strategy Implementation		Template	Robert and Kate Kestnbaum	1980	Manufacturing and Service	Strategy for managing company's relationships and interactions with customers and potential customers.
19.	Deming Cycle PDCA	Internal	Low	Model	Edwards Deming	1993	Manufacturing and Service	Aimed primarily at reducing flow times within production as well as response times from suppliers and to customers
20.	Directional Policy Matrix	Micro and Internal	Low	Matrix	Mc Donald and Payne	1996	Manufacturing and Service	Pick growth avenues based on market attractiveness and company strength
21.	Dynamic Capabilities Analysis	Internal	Medium	Model	Teece	1997	Manufacturing and Service	Analyses the sources and methods of wealth creation and capture by private enterprise firms operating in environments of rapid technological change.
22.	External Factor Evaluation Matrices	External	Medium	Matrix	David	2009	Manufacturing and Service	Examine company's external environment and to identify the available opportunities and threats
23.	Familiarity Matrix	Strategic Choice	Medium	Matrix	Edward and Berry	1985	Manufacturing and Service	Market and technology or service
24.	Game Theory	Micro	High	Matrix	John Von Neumann	1944	Manufacturing and Service	Path of analysis to anticipate a competitor's future move
25.	Gap Analysis	Strategy Implementation	Medium	Graph	Unknown		Manufacturing and Service	Assessing the differences in performance between a business' information systems or software applications to determine whether business requirements are being met and, if not, what steps

								should be taken to ensure they are met successfully
26.	GE Mckinsey Matrix	Micro	Medium	Matrix	Mckinsey		Manufacturing and Service	Evaluates business portfolio, provides further strategic implications and helps to prioritize the investment needed for each business unit
27.	GE Mckinsey 9 Box Matrix	Micro	Medium	Matrix	Mckinsey		Manufacturing and Service	Offers a systematic approach for the multi business corporation to prioritize its investments among its business units
28.	Hayes and Wheelwrights Four Stages Of Capability and Maturity	Internal	Medium	Matrix	Hayes and Wheelwringht	1984	Manufacturing	Explains how an operation could move from being a barrier to strategic success, in stage one, to becoming an innovator and creator of opportunity, in stage four
29.	Hyper Competition	Micro	Medium	Model	Richard d'Aveni	1994	Manufacturing and Service	Predict future industry
30.	Importance Performance Matrix	Internal	Medium	Matrix	Nigel Slack	1996	Manufacturing and Service	Infer an appropriate set of strategic operations decisions or, in conjunction with an independently derived list of the organisation's performance to prioritise each of the competitive factors
31.	Industry Cost Curves	Micro	High	Graph	A Mckinsey Classic By Don C. Watters	1981	Manufacturing	Anticipate capacity investments, plant closures, and pricing changes for a product, using supply curves
32.	Industry Life Cycle	Micro	Low	Graph	Vernon	1966	Manufacturing and Service	A concept relating to the different stages an industry will go through, from the first product entry to its eventual decline.
33.	Inflection Point Analysis	Internal and External	High	Graph	Andy Grove	1998	Manufacturing and Service	Identify when and where inflection points are likely to happen
34.	Innovation Ambition Matrix	Competitive Strategy	Medium	Matrix	Unknown		Manufacturing and Service	Compare existing and new markets to existing and new capabilities
35.	Innovation Funnel	Internal	Medium	Graph	Wheelwright and Clark	1992	Manufacturing	Graphic structure for thinking about the generation and screening of alternative development options, and combining a subset of these into a product concept.
36.	Internal Factor Evaluation Matrix	Internal	Medium	Matrix	David	2009	Manufacturing and Service	Evaluate firm's internal environment and to reveal its strengths as well as weaknesses
37.	TIL	Internal	High	Process	Toyota	1960s	Manufacturing	Reducing flow times within production as well as response times from suppliers and to customers.

38.	Journey Map	Micro	Low	Мар	Unknown		Manufacturing and Service	Journey of a user representing the different touch points that characterise her interactions with the service
39.	Kaoru Ishikawa Control Cycle	Strategy Implementation	Medium	Cycle	Ishikawa	1985	Manufacturing and Service	Determine goals and targets, determine methods of reaching goals, check the effects of implementation, and take appropriate action.
40.	Key Performance Indicators Financial and Non-Financial	Strategy Implementation	Medium	Template	Unknown		Manufacturing and Service	Reflect organisational success or progress in relation to a specified goal
41.	Key Success Factors	Strategy Implementation	Low	Model	Ronald Daniel Of Mckinsey	1961	Manufacturing and Service	Those functions, activities or business practices, defined by the market and as viewed by the customer, that are critical to the vendor/customer relationship
42.	Lean	Strategy Implementation	High	Model	Unknown		Manufacturing	Elimination of waste ("muda") within a manufacturing system.
43.	Lifetime Value Analysis	Micro	Medium	Graph	Shaw and Stone	1988	Manufacturing and Service	Predicting revenue, a customer will generate over his or her entire lifetime
44.	Mckinsey's 7s	Internal	Medium	Template	Mckinsey, Tom Peters and Robert Waterman	1980s	Manufacturing and Service	Seven internal aspects of an organization that need to be aligned if it is to be successful
45.	Mintzbergs 5 PS For Strategy	Strategic Choice	Medium	Framework	Henry Mintzberg	1992	Manufacturing and Service	Plan, ploy, pattern, position, perspective
46.	Monte Carlo Simulation	Internal	Medium	Table	Monte Carlos	1940	Manufacturing and Service	Forecast future events using present data
47.	Organizational Purpose	Internal	Low	Template	Unknown		Manufacturing and Service	Vision, mission, objectives
48.	Pareto Analysis	Micro	High	Chart	Vilfredo Pareto	1906	Manufacturing and Service	Based on the maxim that 20 percent of the products, services, customers or distribution deliver 80% of the profits.
49.	Performance Prism	Strategy Implementation	High	Template	Cranefield University Andy Neely and Chris Adams		Manufacturing and Service	Reciprocal relationship between the organisation and its stakeholder
50.	Personas	Micro and Internal	Medium	Modelling	Angus Jenkinson	1993	Manufacturing and Service	Development of archetypal users to direct vision and design strategy

51.	PEST Analysis	Macro	Low	Model	Aguilar	1967	Manufacturing and Service	To describe the landscape and environment in which a firm operates
52.	Porters Five Forces	Micro	Low	Model	Michael Porter	1980	Manufacturing and Service	Competitiveness level in the industry based on balance of power
53.	Porters Four Corners	Micro	Low	Matrix	Michael Porter	1978	Manufacturing and Service	Analyse competitors' position and predict future actions
54.	Porters Generic Strategy	Strategic Choice	Low	Matrix	Michael Porter	1980	Manufacturing and Service	Describe how a company pursues competitive advantage across its chosen market scope.
55.	Product Life Cycle	Micro	Medium	Graph	Rockwell Intl	1982	Manufacturing	Process of managing the entire lifecycle of a product from inception, through engineering design and manufacture, to service and disposal of manufactured products.
56.	Resource Based Analysis	Internal	Medium	Matrix	Schoemaker and Heijden	1992	Manufacturing and Service	Ensuring that you consider all aspects of the organisation when identifying its strengths and weaknesses
57.	Risk Analysis	Internal and External	Medium	Graph	Unknown		Manufacturing and Service	The process of identifying, assessing and managing the risk in the organization's business strategy— including taking swift action when risk is actually realized
58.	Risk Heat Map	Internal and External	High	Graph	Scot McKay	2011	Manufacturing and Service	To present the results of a risk assessment process visually and in a meaningful and concise way
59.	ROCE Tree	Internal	Medium	Tree	Unknown		Manufacturing and Service	Compare players in the industry to understand structural differences in performance
60.	Scenario Planning	Macro and Micro	Medium	Model	Shell	1970s	Manufacturing and Service	Analyse possible futures
61.	Seven Degrees Of Freedom	Internal	Low	Template	Mehrdad Baghai, Stephen Coley and David White, Partners At Mckinsey and Company	2000	Manufacturing and Service	Identify strengths and build on them
62.	Six Sigma	Strategy Implementation	High	Process	Unknown		Manufacturing	Improve the quality of the output of a process by identifying and removing the causes of defects and minimizing variability in manufacturing and business processes.
63.	Space Matrix	Internal and External	Low	Matrix	Alan Rowe, Richard Mason,	1994	Manufacturing and Service	Analysing competitive position using financial strength and competitive advantage, and industry

					Karl Dickel, Richard Mann and Robert Mockler			strength and environmental stability
64.	Staircases To Growth	Internal	Medium	Model	Mckinsey	1996	Manufacturing and Service	Possible growth path based on skills and options
65.	Stakeholder Mapping Matrix	Strategy Implementation	Medium	Matrix	Mendelow	1991	Manufacturing and Service	Identify all stakeholders for the purpose of identifying their success criteria and turning these into quality goals.
66.	Strategic Blind Spots	Competitive Strategy	High	Model	Porter, Barbara Tuchman	1980, 1984	Manufacturing and Service	Identify if management team is prone to blind spots
67.	Strategic Chessboard	Competitive Strategy	Low	Matrix	A.T Kearney	2011	Manufacturing and Service	Analyse predictability and ability to adapt to the industry
68.	Strategic Group Analysis	Micro	Medium	Graph	Hunt	1972	Manufacturing and Service	Groups companies within an industry that have similar business models or similar combinations of strategies
69.	Strategy Canvas	Strategy Implementation	Low	Graph	Blue Ocean Strategy- Chan Kim and Renée Mauborgne	Unknown	Manufacturing and Service	Graphically captures, in one simple picture, the current strategic landscape and the future prospects for a company
70.	Strategy Diamond	Strategic Choice	Medium	Matrix	Donald Hambrick	2001	Manufacturing and Service	Arenas, vehicles, differentiators, staging and economic logic
71.	Strategy Mapping	Strategy Implementation	Medium	Мар	Kaplan and Norton	1996	Manufacturing and Service	Monitor strategy execution and performance
72.	Structure- Conduct Performance	Micro	Medium	Template	Edward Chamberlin and Joan Robinson	1930s	Manufacturing and Service	Effect of players behaviours and external shocks on industry future profitability and growth
73.	Supplier Relationship Management	Strategy Implementation	High	Framework	Unknown		Manufacturing and Service	Strategically planning for, and managing, all interactions with third party organizations that supply goods and/or services to an organization in order to maximize the value of those interactions
74.	Supply and Demand Curves	Micro	High	Graph	Alfred Marshall	1890	Manufacturing and Service	Determine price in the market
75.	Supply Chain Management	Strategy Implementation	High	Framework	Keith Oliver	1982	Manufacturing and Service	Management of the flow of goods and services
76.	SWOT	Internal and External	Low	Matrix	Unknown		Manufacturing and Service	Strength, weakness, opportunity, threats

77.	Three Horizons	Internal	Low	Graph	Baghai, Coley and White	1999	Manufacturing and Service	Assess potential opportunities for growth without neglecting performance in the present
78.	Three Value Disciplines	Competitive Strategy	Medium	Matrix	Treacy and Wiresema	1993	Manufacturing and Service	Operational excellence, customer intimacy, and product leadership
79.	Total Quality Management	Strategy Implementation	High	Model	Armand Feigenbaum	1983	Manufacturing and Service	Comprehensive and structured approach to organizational management that seeks to improve the quality of products and services through ongoing refinements in response to continuous feedback
80.	TOWS Matrix	External and Internal	Medium	Matrix	Heinz Weihrich	1982	Manufacturing and Service	Threats and opportunities are examined first, and weaknesses and strengths are examined last
81.	Trend Mapping	Macro and Micro	High	Мар	Unknown		Manufacturing and Service	Map large amounts of information to identify trends and patterns
82.	Value Chain Analysis	Internal	Medium	Model	Michael Porter	1979	Manufacturing and Service	Identify where to create the greatest value for customer
83.	Value Net	Micro	Low	Model	Adam Brandenburger and Barry Nalebuff	1996	Manufacturing and Service	Role of complementors and their effect
84.	Value Perform Analysis	Internal	Low	Web	Value Maker		Manufacturing and Service	Analyse importance, performance, and potential of strategy
85.	Voice Of Customer	External	Low	Process	Unknown		Manufacturing and Service	Engage directly with your customers, and other stakeholders
86.	VRIO Analysis	Internal	Low	Framework	Unknown		Manufacturing and Service	Analyse firm's internal resources and capabilities to find out if they can be a source of sustained competitive advantage
87.	War Gaming	Micro	High	Model	Unknown		Manufacturing and Service	Play out scenarios and likely moves of competitors

Appendix 7: Significant Usability Issues in Academic Sector Table 61: Academic Sector User Test

Tasks	Average										
	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	
Attempts on tasks	3	3	2	2	3	1	1	2	4	4	Attempts
Average time on task	9	10	9.8	8	9	9	10	10	10	10	Minutes
Monetary expenses on the task	0	0	0	0	0	0	0	0	0	0	Pounds
Correctly accomplished task	0.8	0.8	0.8	0.6	1	0.6	1	0.8	0.6	0.6	Users
Errors encountered in task	3	4	1	2	4	4	1	2	4	4	Errors
Completed without support	0.8	0.8	0.8	0.6	1	0.6	1	0.8	0.6	0.6	Users
Access to help (Attempt)	0	0.4	0	0.4	0.4	0.4	0	0.4	0	0.4	Users
Response from guide	Yes	Yes	Yes	Yes	yes	Yes	no	Yes	Yes	Yes	
Customer expectations on needs (Thought)	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	No	
Customer adaptability to product (Thought on reuse)	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	No	
Comparison to competition (Thought)	Similar	Similar	Worse	Similar	Better	Similar	Worse	Similar	Worse	Worse	

Appendix 8: Significant Usability Issues in Banking Sector Table 62: Banking Sector User Test

Tasks	Average	9									
Attempts on	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	
Attempts on tasks	1.2	2.1	1	5	1	1	2	4	1	5	Attempts
Average time on task	8.4	9.8	6	10	4	5	7	9	10	10	Minutes
Monetary expenses on the task	0	0	0	0	0	0	0	0	0	0	Pounds
Correctly accomplished task	0.6	0.2	1	0	1	1	1	0.6	1	0	Users
Errors encountered in task	3	7	0	5	0	0	0	1	0	1	Errors
Completed without support	0.6	0.2	1	0	1	1	1	0.6	1	0	Users
Access to help (Attempt)	0.6	0.8	0	2	0	0	1	1	1	1	Users
Response from guide	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	
Customer expectations on needs (Thought)	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	
Customer adaptability to product (Thought on reuse)	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	
Comparison to competition (Thought)	Better	Worse	Similar	Worse	Similar	Similar	Similar	Worse	Better	Worse	

Appendix 9: Significant Usability Issues in Health Sector Table 63: Health Sector User Test

Tasks	Average										
	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	
Attempts on tasks	2	2	1	1	1	1	1	1	2	1	Attempts
Average time on task	4	6	10	10	6	8	4	6	7	8	Minutes
Monetary expenses on the task	0	0	0	0	0	0	8	8	0	0	Pounds
Correctly accomplished task	1	1	1	0	1	1	0.8	1	1	1	Users
Errors encountered in task	2	4	0	1	0	0	0	0	2	4	Errors
Completed without support	1	1	0	0	1	1	0.8	1	1	1	Users
Access to help (Attempt)	1	1	1	1	1	1	1	1	1	1	Users
Response from guide	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Customer expectations on needs (Thought)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Customer adaptability to product (Thought on reuse)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	
Comparison to competition (Thought)	Similar	Similar	Better	Similar							

Appendix 10: Significant Usability Issues in Telecommunications *Table 64: Telecommunications Sector User Test*

Tasks	Average	2									
	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	
Attempts on tasks	8	3	5	7	7	9	4	6	3	2	Attempts
Average time on task	8	4	7	8	10	10	10	10	10	10	Minutes
Monetary expenses on the task	0	0	0	0	0	0	0	0	0	0	Pounds
Correctly accomplished task	0	1	0.6	0.8	0	0	0.2	0.8	0.4	1	Users
Errors encountered in task	8	3	5	7	7	9	4	6	3	2	Errors
Completed without support	0	1	0.6	0.8	0	0	0.2	0.8	0.4	1	Users
Access to help (Attempt)	1	0.2	0.4	0.2	1	1	0.8	0.2	0.6	0	Users
Response from guide	No	Yes	Yes	No	No	No	No	Yes	No	Yes	
Customer expectations on needs (Thought)	No	Yes	Yes	Yes	No	No	No	Yes	No	Yes	
Customer adaptability to product (Thought on reuse)	No	Yes	Yes	Yes	No	No	No	Yes	No	Yes	
Comparison to competition (Thought)	Worse	Similar	Similar	Similar	Similar	Similar	Worse	Similar	Worse	Similar	

Appendix 11: Significant Usability Issues in Retail Sector *Table 65: Retail Sector User Test*

Tasks	Average	1									
	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	
Attempts on tasks	4	3	2	1	3	1	4	2	3	1	Attempts
Average time on task	7	6	4	3	8	9	3	7	8	5	Minutes
Monetary expenses on the task	0	0	0	0	0	0	4	1	3	2	Pounds
Correctly accomplished task	0.8	1	1	1	0.6	1	0.6	1	0.6	1	Users
Errors encountered in task	4	3	2	1	3	1	4	2	3	1	Errors
Completed without support	0.8	1	1	1	0.6	1	0.6	1	0.6	1	Users
Access to help (Attempt)	0.2	0	0	0	0.4	0	0.4	0	0.4	0	Users
Response from guide	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Customer expectations on needs (Thought)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Customer adaptability to product (Thought on reuse)	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	
Comparison to competition (Thought)	Worse	Similar	Similar	Similar	Similar	Similar	Worse	Similar	Worse	Similar	

Appendix 12: Significant Usability Issues in Food Manufacturing *Table 66: Food Manufacturing Sector User Test*

Tasks	Average	1									
	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	
Attempts on tasks	9	3	6	2	1	1	1	1	3	4	Attempts
Average time on task	8.5	3	9	6	4	3	2	2	9.8	10	Minutes
Monetary expenses on the task	0	0	0	0	0	0	0	0	0	0	Pounds
Correctly accomplished task	0.4	1	0.6	1	1	1	1	1	0.2	1	Users
Errors encountered in task	9	3	6	2	1	1	1	1	3	4	Errors
Completed without support	0.4	1	0.6	1	1	1	1	1	0.2	1	Users
Access to help (Attempt)	0.6	0	0.4	0	0	0	0	0	0.8	0	Users
Response from guide	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	
Customer expectations on needs (Thought)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	
Customer adaptability to product (Thought on reuse)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	
Comparison to competition (Thought)	Worse	Similar	Worse	Similar	Worse	Similar	Similar	Similar	Worse	Similar	

Appendix 13:	Significant Usability	Issues in	Mechanical	engineering	manufacturing
Table 67: Med	chanical Manufacturi	ng Sector	User Test		

Tasks	Average										
	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	
Attempts on tasks	3	4	6	5	1	1	2	1	1	2	Attempts
Average time on task	7	8	6	6	3	2	2	4	3	4	Minutes
Monetary expenses on the task	0	0	0	0	0	0	0	0	0	0	Pounds
Correctly accomplished task	1	1	1	1	1	1	1	1	1	1	Users
Errors encountered in task	3	4	6	5	1	1	2	1	1	2	Errors
Completed without support	1	1	1	1	1	1	1	1	1	1	Users
Access to help (Attempt)	0	0	0	0	0	0	0	0	0	0	Users
Response from guide	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Customer expectations on needs (Thought)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Customer adaptability to product (Thought on reuse)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Comparison to competition (Thought)	Similar	Better	Similar	Better							

Appendix 14: Significant Usability Issues in Electronics ManufacturingTable 68: Electronics Manufacturing Sector User Test

Tasks	Average										
Attempts on	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2									
Attempts on tasks	1	1	7	4	9	5	11	4	7	4	Attempts
Average time on task	1	1	8	6	9	9	10	8	10	7	Minutes
Monetary expenses on the task	0	0	0	0	0	0	0	0	0	0	Pounds
Correctly accomplished task	1	1	0.6	1	0.4	0.8	0.2	0.6	0.6	1	Users
Errors encountered in task	1	1	7	4	9	5	11	4	7	0	Errors
Completed without support	1	1	0.6	1	0.4	0.8	0.2	0.6	0.6	1	Users
Access to help (Attempt)	0	0	0.4	0	0.6	0.2	0.8	0.4	0.4	0	Users
Response from guide	Yes	Yes									
Customer expectations on needs (Thought)	Yes	Yes									
Customer adaptability to product (Thought on reuse)	Yes	Yes									
Comparison to competition (Thought)	Similar	Better									

Appendix 15: Significant Usability Issues in Cosmetics Manufacturing *Table 69: Cosmetics Manufacturing Sector User Test*

Tasks	Average										
	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	
Attempts on tasks	3	2	2	3	2	1	1	1	2	1	Attempts
Average time on task	3	4	4	3	3	2	2	3	2	2	Minutes
Monetary expenses on the task	0	0	0	0	0	0	0	0	0	0	Pounds
Correctly accomplished task	1	1	1	1	1	1	1	1	1	1	Users
Errors encountered in task	3	2	2	3	2	1	1	1	2	1	Errors
Completed without support	1	1	1	1	1	1	1	1	1	1	Users
Access to help (Attempt)	0	0	0	0	0	0	0	0	0	0	Users
Response from guide	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Customer expectations on needs (Thought)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Customer adaptability to product (Thought on reuse)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Comparison to competition (Thought)	Similar	Similar	Better	Similar	Similar	Better	Similar	Similar	Similar	Similar	
Appendix 16: Significant Usability Issues in Car Manufacturing *Table 70: Car Manufacturing Sector User Test*

1	Average										
ısks	Task 1		Task 2		Task 3		Task 4		Task 5		
	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	Org1	Org2	
Attempts on tasks	5	3	2	1	3	2	5	3	6	8	Attempt s
Average time on task	7	5	4	3	5	4	7	5	8	10	Minutes
Monetary expenses on the task	0	0	0	0	0	0	0	0	0	0	Pounds
Correctly accomplishe d task	1	1	1	1	1	1	1	1	0.6	0.4	Users
Errors encountered in task	5	3	2	1	3	2	5	3	6	8	Errors
Completed without support	1	1	1	1	1	1	1	1	0.6	0.4	Users
Access to help (Attempt)	0	0	0	0	0	0	0	0	0.4	0.6	Users
Response from guide	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	
Customer expectations on needs (Thought)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	
Customer adaptability to product (Thought on reuse)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	
Comparison to competition (Thought)	Simila r	Bette r	Simila r	Bette r	Simila r	Bette r	Simila r	Bette r	Wors e	Wors e	

Appendix 17: MANOVA ANOVA

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of ability_of_the_product_to_meet_ your_needs is the same across categories of Gender.	Independent- Samples Mann- Whitney U Test	.592	Retain the null hypothesis.
2	The distribution of engagement_with_the_product is the same across categories of Gender.	Independent- Samples Mann- Whitney U Test	.079	Retain the null hypothesis.
3	The distribution of uniqueness_of_the_product_servic is the same across categories of Gender.	Independent- Samples Mann- Whitney U Test	.303	Retain the null hypothesis.
4	The distribution of ease_of_learning_of_the_product service is the same across categories of Gender.	Independent- Samples -Mann- Whitney U Test	.105	Retain the null hypothesis.
5	The distribution of accessibility_of_the_product_ service_and_assortment_of_ channels is the same across categories of Gender.	Independent- Samples Mann- Whitney U Test	.053	Retain the null hypothesis.
6	The distribution of need_for_support_with_the_ product_service is the same across categories of Gender.	Independent- Samples Mann- Whitney U Test	.295	Retain the null hypothesis.
7	The distribution of availability_access_to_support is the same across categories of Gender.	Independent- Samples Mann- Whitney U Test	.463	Retain the null hypothesis.
8	The distribution of response_from_support is the same across categories of Gender.	Independent- Samples Mann- Whitney U Test	.195	Retain the null hypothesis.
9	The distribution of need_for_minimal_resources is the same across categories of Gender.	Independent- Samples eMann- Whitney U Test	.769	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of interaction_delivery_problems is th same across categories of Gender.	Independent- Samples Mann- Whitney U Test	.321	Retain the null hypothesis.
11	The distribution of interaction_speed_timing is the same across categories of Gender.	Independent- Samples Mann- Whitney U Test	.002	Reject the null hypothesis.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of ability_of_the_product_to_meet_ your_needs is the same across categories of Age.	Independent- Samples Kruskal- Wallis Test	1.000	Retain the null hypothesis.
2	The distribution of engagement_with_the_product is the same across categories of Age	Independent- Samples Kruskal- Wallis Test	.980	Retain the null hypothesis.
з	The distribution of uniqueness_of_the_product_servic is the same across categories of Age.	Independent- Samples Kruskal- Wallis Test	.749	Retain the null hypothesis.
4	The distribution of ease_of_learning_of_the_product_ service is the same across categories of Age.	Independent- _Samples Kruskal- Wallis Test	.335	Retain the null hypothesis.
5	The distribution of accessibility_of_the_product_ service_and_assortment_of_ channels is the same across categories of Age.	Independent- Samples Kruskal- Wallis Test	.293	Retain the null hypothesis.
6	The distribution of need_for_support_with_the_ product_service is the same across categories of Age.	Independent- Samples Kruskal- Wallis Test	.290	Retain the null hypothesis.
7	The distribution of availability_access_to_support is the same across categories of Age	Independent- Samples Kruskal- 'Wallis Test	.650	Retain the null hypothesis.
8	The distribution of response_from_support is the same across categories of Age.	Independent- Samples Kruskal- Wallis Test	.476	Retain the null hypothesis.
9	The distribution of need_for_minimal_resources is the same across categories of Age.	Independent- Samples Kruskal- Wallis Test	.184	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of interaction_delivery_problems is t same across categories of Expertise.	Independent- th©amples Kruskal- Wallis Test	.547	Retain the null hypothesis.
11	The distribution of interaction_speed_timing is the same across categories of Expertise.	Independent- Samples Kruskal- Wallis Test	.125	Retain the null hypothesis.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of ability_of_the_product_to_meet_ your_needs is the same across categories of Expertise.	Independent- Samples Kruskal- Wallis Test	.629	Retain the null hypothesis.
2	The distribution of engagement_with_the_product is the same across categories of Expertise.	Independent- Samples Kruskal- Wallis Test	.698	Retain the null hypothesis.
з	The distribution of uniqueness_of_the_product_servic is the same across categories of Expertise.	Independent- ©6amples Kruskal- Wallis Test	.085	Retain the null hypothesis.
4	The distribution of ease_of_learning_of_the_product_ service is the same across categories of Expertise.	Independent- _Samples Kruskal- Wallis Test	.320	Retain the null hypothesis.
5	The distribution of accessibility_of_the_product_ service_and_assortment_of_ channels is the same across categories of Expertise.	Independent- Samples Kruskal- Wallis Test	.020	Reject the null hypothesis.
6	The distribution of need_for_support_with_the_ product_service is the same across categories of Expertise.	Independent- Samples Kruskal- Wallis Test	.441	Retain the null hypothesis.
7	The distribution of availability_access_to_support is the same across categories of Expertise.	Independent- Samples Kruskal- Wallis Test	.699	Retain the null hypothesis.
8	The distribution of response_from_support is the same across categories of Expertise.	Independent- Samples Kruskal- Wallis Test	.078	Retain the null hypothesis.
9	The distribution of need_for_minimal_resources is the same across categories of Expertise.	Independent- Samples Kruskal- Wallis Test	.220	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of interaction_delivery_problems is th same across categories of Age.	Independent- Samples Kruskal- Wallis Test	.990	Retain the null hypothesis.
11	The distribution of interaction_speed_timing is the same across categories of Age.	Independent- Samples Kruskal- Wallis Test	.139	Retain the null hypothesis.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of ability_of_the_product_to_meet_ your_needs is the same across categories of Frequency_of_use.	Independent- Samples Mann- Whitney U Test	.902	Retain the null hypothesis.
2	The distribution of engagement_with_the_product is the same across categories of Frequency_of_use.	Independent- Samples Mann- Whitney U Test	.373	Retain the null hypothesis.
3	The distribution of uniqueness_of_the_product_servic is the same across categories of Frequency_of_use.	Independent- Samples Mann- Whitney U Test	.372	Retain the null hypothesis.
4	The distribution of ease_of_learning_of_the_product service is the same across categories of Frequency_of_use.	Independent- Samples -Mann- Whitney U Test	.851	Retain the null hypothesis.
5	The distribution of accessibility_of_the_product_ service_and_assortment_of_ channels is the same across categories of Frequency_of_use.	Independent- Samples Mann- Whitney U Test	.575	Retain the null hypothesis.
6	The distribution of need_for_support_with_the_ product_service is the same across categories of Frequency_of_use.	Independent- Samples Mann- Whitney U Test	.003	Reject the null hypothesis.
7	The distribution of availability_access_to_support is the same across categories of Frequency_of_use.	Independent- Samples Mann- Whitney U Test	.020	Reject the null hypothesis.
8	The distribution of response_from_support is the same across categories of Frequency_of_use.	Independent- Samples Mann- Whitney U Test	.059	Retain the null hypothesis.
9	The distribution of need_for_minimal_resources is the same across categories of Frequency_of_use.	Independent- Samples Mann- Whitney U Test	.006	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of interaction_delivery_problems is t same across categories of Frequency_of_use.	Independent- h Samples Mann- Whitney U Test	.021	Reject the null hypothesis.
11	The distribution of interaction_speed_timing is the same across categories of Frequency_of_use.	Independent- Samples Mann- Whitney U Test	.295	Retain the null hypothesis.

Between-Subjects Factors

Between-Subjects Factors								
		Value Label	Ν					
Gender	0		4					
	1	male	48					
	2	female	48					
Age	0	0	4					
	1	18 to 30	52					
	2	31 to 40	24					
	3	41 to 50	12					
	4	51 to 60	8					
Expertise	0	0	4					
	1	beginner	16					
	2	intermediate	48					
	3	expert	32					
Frequency of use	0		4					
	1	first time	33					
	2	regular	63					

Multivariate Tests

Multivariate Tests^a

				viultivaliate	16313				
							Partial		
							Eta	Noncent.	
				Hypothesi			Square	Paramete	Observe
Effect		Value	F	s df	Error df	Sig.	d	r	d Power ^d
Intercept	Pillai's	.997	1687.079	11.000	65.000	.000	.997	18557.87	1.000
	Trace		b					3	
	Wilks'	.003	1687.079	11.000	65.000	.000	.997	18557.87	1.000
	Lambda		b					3	
	Hotelling'	285.50	1687.079	11.000	65.000	.000	.997	18557.87	1.000
	s Trace	6	b					3	
	Roy's	285.50	1687.079	11.000	65.000	.000	.997	18557.87	1.000
	Largest	6	b					3	
	Root								
Gender	Pillai's	.220	1.671 ^b	11.000	65.000	.100	.220	18.384	.773
	Trace								
	Wilks'	.780	1.671 ^b	11.000	65.000	.100	.220	18.384	.773
	Lambda								
	Hotelling'	.283	1.671 ^b	11.000	65.000	.100	.220	18.384	.773
	s Trace								
	Roy's	.283	1.671 ^b	11.000	65.000	.100	.220	18.384	.773
	Largest								
	Root								
Age	Pillai's	.626	1.605	33.000	201.00	.026	.209	52.950	.990
	Trace				0				
	Wilks'	.474	1.681	33.000	192.20	.017	.220	54.340	.991
	Lambda				6				
	Hotelling'	.903	1.743	33.000	191.00	.011	.231	57.517	.995
	s Trace				0				
	Roy's	.516	3.145 ^c	11.000	67.000	.002	.341	34.594	.980
	Largest								
	Root								
Expertise	Pillai's	.550	2.276	22.000	132.00	.002	.275	50.063	.994
	Trace				0				

	Wilks' Lambda	.484	2.582 ^b	22.000	130.00 0	.000	.304	56.802	.998
	Hotelling'	.994	2.892	22.000	128.00	.000	.332	63.620	.999
	Roy's Largest	.917	5.501 ^c	11.000	66.000	.000	.478	60.516	1.000
Frequenc v of use	Pillai's Trace	.150	1.041 ^b	11.000	65.000	.422	.150	11.451	.519
,	Wilks' Lambda	.850	1.041 ^b	11.000	65.000	.422	.150	11.451	.519
	Hotelling' s Trace	.176	1.041 ^b	11.000	65.000	.422	.150	11.451	.519
	Roy's Largest Root	.176	1.041 ^b	11.000	65.000	.422	.150	11.451	.519
Gender * Age	Pillai's Trace	.117	.373	22.000	132.00 0	.995	.059	8.211	.271
	Wilks' Lambda	.884	.377 ^b	22.000	130.00 0	.995	.060	8.290	.273
	Hotelling' s Trace	.131	.380	22.000	128.00 0	.995	.061	8.363	.276
	Roy's Largest Root	.123	.739 ^c	11.000	66.000	.698	.110	8.128	.366
Gender * Expertise	Pillai's Trace	.362	3.354 ^b	11.000	65.000	.001	.362	36.890	.987
	Wilks' Lambda	.638	3.354 ^b	11.000	65.000	.001	.362	36.890	.987
	Hotelling' s Trace	.568	3.354 ^b	11.000	65.000	.001	.362	36.890	.987
	Roy's Largest Root	.568	3.354 ^b	11.000	65.000	.001	.362	36.890	.987
Gender * Frequenc	Pillai's Trace	.275	2.244 ^b	11.000	65.000	.022	.275	24.681	.902
y of use	Wilks' Lambda	.725	2.244 ^b	11.000	65.000	.022	.275	24.681	.902
	Hotelling' s Trace	.380	2.244 ^b	11.000	65.000	.022	.275	24.681	.902
	Roy's Largest Root	.380	2.244 ^b	11.000	65.000	.022	.275	24.681	.902
Age * Expertise	Pillai's Trace	.347	.798	33.000	201.00 0	.777	.116	26.328	.756
	Wilks' Lambda	.675	.833	33.000	192.20 6	.728	.123	26.950	.767
	Hotelling' s Trace	.450	.868	33.000	191.00 0	.676	.130	28.656	.800
	Roy's Largest Root	.366	2.226 ^c	11.000	67.000	.023	.268	24.490	.901
Age * Frequenc	Pillai's Trace	.275	.956	22.000	132.00 0	.523	.137	21.041	.715

y of use	Wilks'	.737	.976 ^b	22.000	130.00	.498	.142	21.476	.725
	Lampua	242	005	22.000	128.00	175	146	21 002	725
	s Trace	.542	.995	22.000	128.00	.475	.140	21.095	./55
	Rov's	.288	1.727 ^c	11.000	66.000	.087	.223	18,993	.790
	Largest	.200						20.000	
	Root								
Expertise	Pillai's	.568	2.381	22.000	132.00	.001	.284	52.385	.996
*	Trace				0				
Frequenc	Wilks'	.485	2.579 ^b	22.000	130.00	.000	.304	56.731	.998
y of use	Lambda				0				
	Hotelling'	.954	2.776	22.000	128.00	.000	.323	61.061	.999
	s Trace				0				
	Roy's	.821	4.927 ^c	11.000	66.000	.000	.451	54.198	1.000
	Largest								
	Root	000	h	000	000				
Gender *	Pillai's	.000	."	.000	.000		•		•
Age ·		1 000	b	000	70.000				
Lypertise	VVIIKS	1.000		.000	70.000	•			•
	Hotelling'	000	b	000	2 000				
	s Trace	.000		.000	2.000	•			•
	Rov's	.000	.000 ^b	11.000	64.000	1.00	.000	.000	.050
	Largest				0	0			
	Root								
Gender *	Pillai's	.063	.400 ^b	11.000	65.000	.951	.063	4.404	.197
Age *	Trace								
Frequenc	Wilks'	.937	.400 ^b	11.000	65.000	.951	.063	4.404	.197
y of use	Lambda								
	Hotelling'	.068	.400 ^b	11.000	65.000	.951	.063	4.404	.197
	s Trace								
	Roy's	.068	.400 ^b	11.000	65.000	.951	.063	4.404	.197
	Largest								
Candan *	ROOT	205	2 COOP	11 000	CE 000	000	205	20.470	045
Evnertise	Trace	.305	2.589	11.000	05.000	.009	.305	28.470	.945
*	Wilke'	605	2 5 8 0 b	11 000	65.000	000	205	28 176	0/15
Frequenc	Lambda	.055	2.505	11.000	05.000	.005	.505	20.470	.545
y of use	Hotelling'	.438	2.589 ^b	11.000	65.000	.009	.305	28.476	.945
	s Trace								
	Roy's	.438	2.589 ^b	11.000	65.000	.009	.305	28.476	.945
	Largest								
	Root								
Age *	Pillai's	.520	2.105	22.000	132.00	.005	.260	46.319	.989
Expertise	Trace				0				
*	Wilks'	.527	2.233 ^b	22.000	130.00	.003	.274	49.132	.993
Frequenc	Lambda				0				
y of use	Hotelling'	.811	2.359	22.000	128.00	.002	.289	51.905	.996
	s Trace				0				
	Roy's	.683	4.095 ^c	11.000	66.000	.000	.406	45.048	.997
	Largest								
Gondor *	Pilloile	000	b	000	000				
	Trace	.000	•	.000	.000	•		•	•
1.80	indee								

Expertise	Wilks'	1.000	. ^b	.000	70.000				
*	Lambda								
Frequenc	Hotelling'	.000	.b	.000	2.000				
y of use	s Trace								
	Roy's	.000	.000 ^b	11.000	64.000	1.00	.000	.000	.050
	Largest					0			
	Root								

a. Design: Intercept + Gender + Age + Expertise + Frequency of use + Gender * Age + Gender * Expertise + Gender * Frequency of use + Age * Expertise + Age * Frequency of use + Expertise * Frequency of use + Gender * Age * Expertise + Gender * Age * Frequency of use + Gender * Expertise * Frequency of use + Age * Expertise * Frequency of use + Gender * Age * Expertise * Frequency of use

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

d. Computed using alpha = .05

Tests of Between-Subjects Effects

Tests of Between-Subjects Effects										
		Type III					Partial			
	Dependent	Sum of		Mean			Eta	Noncent.	Observed	
Source	Variable	Squares	df	Square	F	Sig.	Squared	Parameter	Power ^I	
Corrected Model	ability of the product to meet your needs	57.615ª	24	2.401	5.744	.000	.648	137.855	1.000	
	engagement with the product	67.246 ^b	24	2.802	6.385	.000	.671	153.229	1.000	
	uniqueness of the product service	77.553 ^c	24	3.231	2.748	.000	.468	65.941	.998	
	ease of learning of the product service	76.684 ^d	24	3.195	4.448	.000	.587	106.750	1.000	
	accessibility of the product service and assortment of channels	77.254 ^e	24	3.219	6.527	.000	.676	156.657	1.000	
	need for support with the product service	91.136 ^f	24	3.797	4.679	.000	.600	112.302	1.000	
	availability access to support	98.789 ^g	24	4.116	4.399	.000	.585	105.586	1.000	
	response from support	88.829 ^h	24	3.701	4.123	.000	.569	98.947	1.000	
	need for minimal resources	123.792 ⁱ	24	5.158	6.711	.000	.682	161.055	1.000	
	interaction delivery problems	101.654 ^j	24	4.236	2.396	.002	.434	57.503	.995	
	interaction speed timing	79.871 ^k	24	3.328	5.186	.000	.624	124.466	1.000	

Intercept	ability of the product to meet your needs	473.777	1	473.777	1133.610	.000	.938	1133.610	1.000
	engagement with the product	525.854	1	525.854	1198.235	.000	.941	1198.235	1.000
	uniqueness of the product service	428.471	1	428.471	364.316	.000	.829	364.316	1.000
	ease of learning of the product service	567.910	1	567.910	790.576	.000	.913	790.576	1.000
	accessibility of the product service and assortment of channels	559.456	1	559.456	1134.470	.000	.938	1134.470	1.000
	need for support with the product service	538.340	1	538.340	663.369	.000	.898	663.369	1.000
	availability access to support	503.247	1	503.247	537.876	.000	.878	537.876	1.000
	response from support	597.293	1	597.293	665.325	.000	.899	665.325	1.000
	need for minimal resources	644.907	1	644.907	839.029	.000	.918	839.029	1.000
	interaction delivery problems	430.735	1	430.735	243.655	.000	.765	243.655	1.000
	interaction speed timing	367.793	1	367.793	573.141	.000	.884	573.141	1.000
Gender	ability of the product to meet your needs	.107	1	.107	.256	.615	.003	.256	.079
	engagement with the product	.593	1	.593	1.352	.249	.018	1.352	.209
	uniqueness of the product service	3.863	1	3.863	3.284	.074	.042	3.284	.432
	ease of learning of the product service	1.783	1	1.783	2.482	.119	.032	2.482	.343
	accessibility of the product service and assortment of channels	.885	1	.885	1.794	.184	.023	1.794	.262
	need for support with the product service	4.682	1	4.682	5.769	.019	.071	5.769	.659

	availability	1.378	1	1.378	1.472	.229	.019	1.472	.224
	access to								
	support								
	response from	.370	1	.370	.412	.523	.005	.412	.097
	support	420	1	420	E 4 7	462	007	E 4 7	112
	minimal	.420	T	.420	.547	.402	.007	.547	.115
	resources								
	interaction	1 670	1	1 670	050	222	012	050	161
	delivery	1.079	1	1.079	.930	.555	.015	.930	.101
	nrohlems								
	interaction	1 877	1	1 877	2 926	001	038	2 926	203
	speed timing	1.077	1	1.077	2.520	.051	.058	2.520	.555
Age	ability of the	.088	3	.029	.070	.976	.003	.211	.062
	product to meet								
	your needs								
	engagement	.184	3	.061	.139	.936	.006	.418	.074
	with the								
	product								
	uniqueness of	.478	3	.159	.136	.939	.005	.407	.074
	the product								
	service								
	ease of learning	2.719	3	.906	1.262	.294	.048	3.785	.325
	of the product								
	service								
	accessibility of	.667	3	.222	.451	.717	.018	1.353	.137
	the product								
	service and								
	assortment of								
	channels								
	need for	2.597	3	.866	1.067	.368	.041	3.200	.278
	support with								
	the product								
	service								
	availability	2.089	3	.696	.744	.529	.029	2.233	.202
	access to								
	support								
	response from	6.181	3	2.060	2.295	.085	.084	6.885	.557
	support								
	need for	4.311	3	1.437	1.869	.142	.070	5.608	.466
	minimal								
	resources	204	2	407	072	075	000	245	062
	interaction	.381	3	.127	.072	.975	.003	.215	.062
	delivery								
	problems	2.067	2	1 200	2 000	120	074	C 02C	407
	speed timing	3.86/	3	1.289	2.009	.120	.074	6.026	.497
Expertise	ability of the	.542	2	.271	.648	.526	.017	1.297	.155
	product to meet								
	your needs								
	engagement	.987	2	.493	1.124	.330	.029	2.249	.241
	with the								
	product								

	uniqueness of the product service	8.048	2	4.024	3.422	.038	.084	6.843	.626
	ease of learning of the product service	.131	2	.066	.091	.913	.002	.183	.063
	accessibility of the product service and assortment of channels	3.369	2	1.684	3.416	.038	.083	6.831	.625
	need for support with the product service	1.543	2	.771	.951	.391	.025	1.901	.209
	availability access to support	.180	2	.090	.096	.909	.003	.192	.064
	response from support	1.144	2	.572	.637	.532	.017	1.275	.153
	need for minimal resources	1.894	2	.947	1.232	.298	.032	2.464	.261
	interaction delivery problems	1.345	2	.673	.381	.685	.010	.761	.109
	interaction speed timing	.689	2	.344	.537	.587	.014	1.073	.136
Frequency of use	ability of the product to meet your needs	.208	1	.208	.497	.483	.007	.497	.107
	engagement with the product	.000	1	.000	.000	.986	.000	.000	.050
	uniqueness of the product service	.065	1	.065	.055	.815	.001	.055	.056
	ease of learning of the product service	.147	1	.147	.205	.652	.003	.205	.073
	accessibility of the product service and assortment of channels	.028	1	.028	.057	.811	.001	.057	.056
	need for support with the product service	1.201	1	1.201	1.480	.228	.019	1.480	.225
	availability access to support	1.974	1	1.974	2.110	.151	.027	2.110	.300
	response from support	.986	1	.986	1.098	.298	.014	1.098	.179

	need for minimal resources	1.961	1	1.961	2.551	.114	.033	2.551	.351
	interaction delivery problems	1.494	1	1.494	.845	.361	.011	.845	.148
	interaction speed timing	1.287	1	1.287	2.006	.161	.026	2.006	.288
Gender * Age	ability of the product to meet your needs	.024	2	.012	.029	.971	.001	.058	.054
	engagement with the product	.096	2	.048	.109	.897	.003	.219	.066
	uniqueness of the product service	.510	2	.255	.217	.805	.006	.434	.083
	ease of learning of the product service	.342	2	.171	.238	.789	.006	.476	.086
	accessibility of the product service and assortment of channels	.001	2	.000	.001	.999	.000	.002	.050
	need for support with the product service	1.645	2	.823	1.014	.368	.026	2.028	.221
	availability access to support	1.348	2	.674	.720	.490	.019	1.441	.168
	response from support	.833	2	.416	.464	.631	.012	.928	.123
	need for minimal resources	1.207	2	.604	.785	.460	.021	1.570	.179
	interaction delivery problems	.016	2	.008	.005	.995	.000	.009	.051
	interaction speed timing	.483	2	.242	.376	.688	.010	.753	.108
Gender * Expertise	ability of the product to meet your needs	.388	1	.388	.929	.338	.012	.929	.158
	engagement with the product	.193	1	.193	.439	.510	.006	.439	.100
	uniqueness of the product service	2.652	1	2.652	2.255	.137	.029	2.255	.317
	ease of learning of the product service	1.935	1	1.935	2.694	.105	.035	2.694	.367

	accessibility of the product service and assortment of channels	.000	1	.000	.000	.984	.000	.000	.050
	need for support with the product service	2.851	1	2.851	3.513	.065	.045	3.513	.456
	availability access to support	10.263	1	10.263	10.970	.001	.128	10.970	.905
	response from support	2.382	1	2.382	2.653	.108	.034	2.653	.363
	need for minimal resources	7.162	1	7.162	9.318	.003	.111	9.318	.854
	interaction delivery problems	2.470	1	2.470	1.397	.241	.018	1.397	.215
	interaction speed timing	1.725	1	1.725	2.688	.105	.035	2.688	.367
Gender * Frequency of use	ability of the product to meet your needs	1.977	1	1.977	4.730	.033	.059	4.730	.574
	engagement with the product	.892	1	.892	2.033	.158	.026	2.033	.291
	uniqueness of the product service	.050	1	.050	.043	.837	.001	.043	.055
	ease of learning of the product service	.006	1	.006	.008	.929	.000	.008	.051
	accessibility of the product service and assortment of channels	.551	1	.551	1.117	.294	.015	1.117	.181
	need for support with the product service	4.388	1	4.388	5.407	.023	.067	5.407	.631
	availability access to support	8.075	1	8.075	8.631	.004	.103	8.631	.826
	response from support	5.415	1	5.415	6.032	.016	.074	6.032	.679
	need for minimal resources	1.787	1	1.787	2.325	.131	.030	2.325	.325
	interaction delivery problems	12.632	1	12.632	7.145	.009	.087	7.145	.751

	interaction speed timing	2.462	1	2.462	3.837	.054	.049	3.837	.490
Age * Expertise	ability of the product to meet your needs	.199	3	.066	.159	.924	.006	.476	.078
	engagement with the product	.212	3	.071	.161	.922	.006	.482	.078
	uniqueness of the product service	.378	3	.126	.107	.956	.004	.322	.069
	ease of learning of the product service	.740	3	.247	.343	.794	.014	1.030	.114
	accessibility of the product service and assortment of channels	.161	3	.054	.109	.955	.004	.326	.069
	need for support with the product service	3.428	3	1.143	1.408	.247	.053	4.225	.359
	availability access to support	2.131	3	.710	.759	.521	.029	2.278	.205
	response from support	3.499	3	1.166	1.299	.281	.049	3.897	.333
	need for minimal resources	1.614	3	.538	.700	.555	.027	2.099	.192
	interaction delivery problems	.937	3	.312	.177	.912	.007	.530	.081
	interaction speed timing	1.598	3	.533	.830	.482	.032	2.490	.222
Age * Frequency of use	ability of the product to meet your needs	.312	2	.156	.374	.690	.010	.747	.108
	engagement with the product	.883	2	.442	1.006	.371	.026	2.012	.219
	uniqueness of the product service	1.190	2	.595	.506	.605	.013	1.011	.130
	ease of learning of the product service	.157	2	.079	.109	.896	.003	.219	.066
	accessibility of the product service and assortment of channels	1.382	2	.691	1.401	.253	.036	2.802	.292

	need for support with the product	1.365	2	.682	.841	.435	.022	1.682	.189
	availability access to support	.448	2	.224	.240	.788	.006	.479	.086
	response from support	.047	2	.024	.026	.974	.001	.053	.054
	need for minimal resources	1.407	2	.703	.915	.405	.024	1.830	.203
	interaction delivery problems	3.491	2	1.745	.987	.377	.026	1.975	.216
	interaction speed timing	.732	2	.366	.570	.568	.015	1.141	.141
Expertise * Frequency	ability of the product to meet your needs	.827	2	.414	.990	.376	.026	1.980	.216
of use	engagement with the product	1.177	2	.588	1.341	.268	.035	2.682	.281
	uniqueness of the product service	4.541	2	2.270	1.931	.152	.049	3.861	.389
	ease of learning of the product service	.398	2	.199	.277	.759	.007	.553	.092
	accessibility of the product service and assortment of channels	.258	2	.129	.261	.771	.007	.522	.090
	need for support with the product service	.388	2	.194	.239	.788	.006	.478	.086
	availability access to support	1.526	2	.763	.815	.446	.021	1.631	.185
	response from support	.680	2	.340	.379	.686	.010	.758	.109
	need for minimal resources	4.804	2	2.402	3.125	.050	.077	6.250	.584
	interaction delivery problems	1.102	2	.551	.312	.733	.008	.623	.098
	interaction speed timing	3.513	2	1.757	2.737	.071	.068	5.475	.525
Gender * Age * Expertise	ability of the product to meet your needs	.000	0	•	•	•	.000	.000	

	engagement with the product	.000	0	·		•	.000	.000	
	uniqueness of the product service	.000	0			·	.000	.000	
	ease of learning of the product service	.000	0	•	•	•	.000	.000	•
	accessibility of the product service and assortment of channels	.000	0				.000	.000	
	need for support with the product service	.000	0			•	.000	.000	
	availability access to support	.000	0				.000	.000	
	response from support	.000	0				.000	.000	
	need for minimal resources	.000	0	•	·	·	.000	.000	•
	interaction delivery problems	.000	0				.000	.000	
	interaction speed timing	.000	0	•			.000	.000	•
Gender * Age * Frequency	ability of the product to meet your needs	.324	1	.324	.774	.382	.010	.774	.140
of use	engagement with the product	.111	1	.111	.252	.617	.003	.252	.079
	uniqueness of the product service	.022	1	.022	.019	.892	.000	.019	.052
	ease of learning of the product service	.501	1	.501	.698	.406	.009	.698	.131
	accessibility of the product service and assortment of channels	.105	1	.105	.213	.646	.003	.213	.074
	need for support with the product service	.036	1	.036	.045	.833	.001	.045	.055
	availability access to support	.035	1	.035	.038	.847	.001	.038	.054

	response from	.274	1	.274	.305	.582	.004	.305	.085
	need for minimal	.132	1	.132	.172	.680	.002	.172	.069
	resources interaction delivery	.439	1	.439	.248	.620	.003	.248	.078
	problems interaction speed timing	.109	1	.109	.170	.682	.002	.170	.069
Gender * Expertise *	ability of the product to meet your needs	.072	1	.072	.173	.678	.002	.173	.070
Frequency of use	engagement with the product	.024	1	.024	.055	.815	.001	.055	.056
	uniqueness of the product service	.362	1	.362	.308	.581	.004	.308	.085
	ease of learning of the product service	.293	1	.293	.408	.525	.005	.408	.097
	accessibility of the product service and assortment of channels	4.274	1	4.274	8.667	.004	.104	8.667	.828
	need for support with the product service	.704	1	.704	.867	.355	.011	.867	.151
	availability access to support	.053	1	.053	.057	.813	.001	.057	.056
	response from support	.424	1	.424	.473	.494	.006	.473	.104
	need for minimal resources	1.415	1	1.415	1.841	.179	.024	1.841	.268
	interaction delivery problems	.260	1	.260	.147	.703	.002	.147	.067
	interaction speed timing	.177	1	.177	.277	.601	.004	.277	.081
Age * Expertise *	ability of the product to meet your needs	.175	2	.087	.209	.812	.006	.418	.081
Frequency of use	engagement with the product	.392	2	.196	.446	.642	.012	.893	.120
	uniqueness of the product service	2.676	2	1.338	1.138	.326	.029	2.275	.243

	ease of learning of the product service	.222	2	.111	.154	.857	.004	.309	.073
	accessibility of the product service and assortment of channels	.101	2	.051	.102	.903	.003	.205	.065
	need for support with the product service	3.193	2	1.597	1.968	.147	.050	3.935	.395
	availability access to support	12.149	2	6.075	6.493	.003	.148	12.985	.896
	response from support	4.523	2	2.262	2.519	.087	.063	5.038	.490
	need for minimal resources	8.890	2	4.445	5.783	.005	.134	11.566	.856
	interaction delivery problems	6.279	2	3.139	1.776	.176	.045	3.552	.361
	interaction speed timing	4.629	2	2.314	3.607	.032	.088	7.213	.651
Gender * Age * Expertise * Frequency of use	ability of the product to meet your needs	.000	0			·	.000	.000	
	engagement with the product	.000	0				.000	.000	
	uniqueness of the product service	.000	0				.000	.000	
	ease of learning of the product service	.000	0				.000	.000	
	accessibility of the product service and assortment of channels	.000	0				.000	.000	
	need for support with the product service	.000	0			·	.000	.000	
	availability access to support	.000	0			•	.000	.000	
	response from support	.000	0	•			.000	.000	•
	need for minimal resources	.000	0				.000	.000	

	interaction delivery problems	.000	0	•	•	•	.000	.000	
	interaction speed timing	.000	0				.000	.000	
Error	ability of the product to meet your needs	31.345	75	.418					
	engagement with the product	32.914	75	.439					
	uniqueness of the product service	88.207	75	1.176					
	ease of learning of the product service	53.876	75	.718					
	accessibility of the product service and assortment of channels	36.986	75	.493					
1 5 1 6 6 6 6 6	need for support with the product service	60.864	75	.812					
	availability access to support	70.171	75	.936					
	response from support	67.331	75	.898					
	need for minimal resources	57.648	75	.769					
	interaction delivery problems	132.586	75	1.768					
	interaction speed timing	48.129	75	.642					
Total	ability of the product to meet your needs	1300.000	100						
	engagement with the product	1484.000	100						
	uniqueness of the product service	1268.000	100						
	ease of learning of the product service	1636.000	100						

	accessibility of the product service and assortment of channels	1528.000	100			
	need for support with the product service	1448.000	100			
	availability access to support	1408.000	100			
	response from support	1540.000	100			
	need for minimal resources	1912.000	100			
	interaction delivery problems	1284.000	100			
	interaction speed timing	1028.000	100			
Corrected Total	ability of the product to meet your needs	88.960	99			
	engagement with the product	100.160	99			
	uniqueness of the product service	165.760	99			
	ease of learning of the product service	130.560	99			
	accessibility of the product service and assortment of channels	114.240	99			
	need for support with the product service	152.000	99			
	availability access to support	168.960	99			
	response from support	156.160	99			
	need for minimal resources	181.440	99			
	interaction delivery problems	234.240	99			

interaction	128.000	99					
speed timing							
a. R Squared = .648 (Adjusted R Squared = .535)							
b. R Squared = .671 (Adjusted	d R Squared	= .566)					
c. R Squared = .468 (Adjusted	1 R Squared	= .298)					
d. R Squared = .587 (Adjusted	d R Squared	= .455)					
e. R Squared = .676 (Adjusted	d R Squared	= .573)					
f. R Squared = .600 (Adjusted	l R Squared :	= .471)					
g. R Squared = .585 (Adjusted	d R Squared	= .452)					
h. R Squared = .569 (Adjusted	d R Squared	= .431)					

h. R Squared = .569 (Adjusted R Squared = .431) i. R Squared = .682 (Adjusted R Squared = .581)

j. R Squared = .434 (Adjusted R Squared = .253)

k. R Squared = .624 (Adjusted R Squared = .504)

I. Computed using alpha = .05

Post Hoc Tests Gender Multiple Comparisons

Multiple Comparisons

Tukey HSD

			Mean		
	(1)	(J)	Difference	Std.	
Dependent Variable	Gender	Gender	(I-J)	Error	Sig.
ability of the product to meet	male				
your needs		female	08	.132	.803
	female				
		male	.08	.132	.803
engagement with the product	male				
		female	25	.135	.161
	female				
		male	.25	.135	.161
uniqueness of the product service	male				
		female	25	.221	.499
	female				
		male	.25	.221	.499
ease of learning of the product	male				
service		female	25	.173	.323
	female				
		male	.25	.173	.323
accessibility of the product	male				
service and assortment of		female	.33	.143	.058
channels	female				
		male	- 33	143	058
need for support with the	male				
product service	mare	female	- 33	184	172
	female	Ternare		.101	.172
	Ternare	male	33	184	172
availability access to support	male	mare	.55	.104	.172
availability access to support	mare	female	17	197	677
	female	Ternare	.17	.157	.077
	Ternate	male	_ 17	107	677
response from support	male	maie	17	.157	.077
response nom support	male	female	¢ב	102	101
	female	lemale	.25	.193	.404
	rendle				

		male	25	.193	.404
need for minimal resources	male				
		female	.00	.179	1.000
	female				
		male	.00	.179	1.000
interaction delivery problems	male				
		female	.25	.271	.629
	female				
		male	25	.271	.629
interaction speed timing	male				
		female	.58 [*]	.164	.002
	female				
		male	58 [*]	.164	.002

Age Multiple Comparisons

Tukey HSD

Multiple Comparisons

			Mean		
			Difference	Std.	
Dependent Variable	(I) Age	(J) Age	(I-J)	Error	Sig.
ability of the product to meet	18 to 30	0	3.62*	.335	.000
your needs		31 to 40	.03	.160	1.000
		41 to 50	13	.207	.966
		51 to 60	01	.246	1.000
	31 to 40	0	3.58 [*]	.349	.000
		18 to 30	03	.160	1.000
		41 to 50	17	.229	.949
		51 to 60	04	.264	1.000
	41 to 50	0	3.75 [*]	.373	.000
		18 to 30	.13	.207	.966
		31 to 40	.17	.229	.949
		51 to 60	.12	.295	.993
	51 to 60	0	3.63*	.396	.000
		18 to 30	.01	.246	1.000
		31 to 40	.04	.264	1.000
		41 to 50	12	.295	.993
engagement with the product	18 to 30	0	3.90 [*]	.344	.000
		31 to 40	.07	.163	.993
		41 to 50	01	.212	1.000
		51 to 60	.15	.252	.973
	31 to 40	0	3.83*	.358	.000
		18 to 30	07	.163	.993
		41 to 50	08	.234	.996
		51 to 60	.08	.270	.998
	41 to 50	0	3.92*	.382	.000
		18 to 30	.01	.212	1.000
		31 to 40	.08	.234	.996
		51 to 60	.17	.302	.981
	51 to 60	0	3.75 [*]	.406	.000
		18 to 30	15	.252	.973
		31 to 40	08	.270	.998
		41 to 50	17	.302	.981

uniqueness of the product	18 to 30	0	3.52*	.563	.000
service		31 to 40	02	.268	1.000
		41 to 50	.10	.347	.998
		51 to 60	.64	.412	.525
	31 to 40	0	3.54*	.586	.000
		18 to 30	.02	.268	1.000
		41 to 50	.13	.383	.998
		51 to 60	.67	.443	.562
	41 to 50	0	3.42*	.626	.000
		18 to 30	10	.347	.998
		31 to 40	13	.383	.998
		51 to 60	.54	.495	.809
	51 to 60	0	2.88*	.664	.000
		18 to 30	64	.412	.525
		31 to 40	67	.443	.562
		41 to 50	54	.495	.809
ease of learning of the product	18 to 30	0	4.13*	.440	.000
service		31 to 40	.01	.209	1.000
		41 to 50	.47	.271	.426
		51 to 60	.38	.322	.754
	31 to 40	0	4.13*	.458	.000
		18 to 30	01	.209	1.000
		41 to 50	.46	.300	.547
		51 to 60	.38	.346	.814
	41 to 50	0	3 67*	489	000
	12 00 50	18 to 30	- 47	271	426
		31 to 40	- 46	300	547
		51 to 60	- 08	387	1 000
	51 to 60	0	3 75*	519	000
		18 to 30	- 38	322	754
		31 to 40	- 38	346	814
		41 to 50	.50	387	1 000
accessibility of the product	18 to 30	0	3 83*	364	000
service and assortment of	10 10 50	31 to 40	- 38	173	191
channels		41 to 50	.50	225	953
		51 to 60	- 17	267	966
	31 to 40	0	4 21 [*]	379	000
	51 10 40	18 to 30	38	173	191
		41 to 50	54	248	198
		51 to 60	21	287	950
	41 to 50	0	3.67*	405	000
	41 (0 50	18 to 30	- 16	225	953
		31 to 40	- 54	248	198
		51 to 60	_ 33	270	836
	51 to 60	0	55 / 00*	/20	000
	51 10 00	18 to 20	4.00	.+30	320
		31 to 40	.⊥/ _)1	.207	.500 Q50
		41 to 50	21	.207	.220
need for support with the	19 to 20	41 10 50	.33 *c7 c	.521	000
need for support with the	10 10 30	21 to 10	5./3 דר	.407	.000
product service		41 to 50	27	.222	.745
		41 to 50	.12	.209	.900
		21 10 00	.30	.542	.030

	31 to 40	0	4.00*	.487	.000
		18 to 30	.27	.222	.745
		41 to 50	.42	.318	.687
		51 to 60	.63	.368	.441
	41 to 50	0	3.58*	.520	.000
		18 to 30	15	.289	.986
		31 to 40	42	.318	.687
		51 to 60	.21	.411	.986
	51 to 60	0	3.38*	.552	.000
		18 to 30	36	.342	.836
		31 to 40	63	.368	.441
		41 to 50	21	.411	.986
availability access to support	18 to 30	0	3.63 [*]	.502	.000
		31 to 40	16	.239	.965
		41 to 50	.13	.310	.992
		51 to 60	12	.367	.998
	31 to 40	0	3.79 [*]	.522	.000
		18 to 30	.16	.239	.965
		41 to 50	.29	.342	.913
		51 to 60	.04	.395	1.000
	41 to 50	0	3.50*	.558	.000
		18 to 30	13	.310	.992
		31 to 40	29	.342	.913
		51 to 60	25	.441	.980
	51 to 60	0	3.75*	.592	.000
		18 to 30	.12	.367	.998
		31 to 40	04	.395	1.000
		41 to 50	.25	.441	.980
response from support	18 to 30	0	3.71*	.492	.000
	18 (0 50	31 to 40	41	.234	.400
		41 to 50	37	.303	.737
		51 to 60	16	.360	.991
	31 to 40	0	4.13*	.512	.000
		18 to 30	.41	.234	.400
		41 to 50	.04	.335	1.000
		51 to 60	.25	.387	.967
	41 to 50	0	4.08*	.547	.000
		18 to 30	.37	.303	.737
		31 to 40	04	.335	1.000
		51 to 60	.21	.432	.989
	51 to 60	0	3.88*	.580	.000
		18 to 30	.16	.360	.991
		31 to 40	25	.387	.967
		41 to 50	21	.432	.989
need for minimal resources	18 to 30	0	4.46*	.455	.000
		31 to 40	.04	.216	1.000
		41 to 50	.79*	.281	.046
		51 to 60	.21	.333	.969
	31 to 40	0	4.42 [*]	.473	.000
	011010	18 to 30	04	.216	1.000
		41 to 50	.75	.310	.121
		51 to 60	.17	.358	.990

	41 to 50	0	3.67*	.506	.000
		18 to 30	79*	.281	.046
		31 to 40	75	.310	.121
		51 to 60	58	.400	.593
	51 to 60	0	4.25*	.537	.000
		18 to 30	21	.333	.969
		31 to 40	17	.358	.990
		41 to 50	.58	.400	.593
interaction delivery problems	18 to 30	0	3.38*	.690	.000
		31 to 40	.18	.328	.983
		41 to 50	20	.426	.990
		51 to 60	12	.505	.999
	31 to 40	0	3.21*	.718	.000
		18 to 30	18	.328	.983
		41 to 50	38	.470	.930
		51 to 60	29	.543	.983
	41 to 50	0	3.58*	.768	.000
		18 to 30	.20	.426	.990
	-	31 to 40	.38	.470	.930
		51 to 60	.08	.607	1.000
	51 to 60	0	3.50 [*]	.814	.000
	-	18 to 30	.12	.505	.999
		31 to 40	.29	.543	.983
		41 to 50	08	.607	1.000
interaction speed timing	18 to 30	0	3.06*	.416	.000
		31 to 40	44	.198	.177
		41 to 50	.31	.257	.752
		51 to 60	.06	.304	1.000
	31 to 40	0	3.50 [*]	.433	.000
		18 to 30	.44	.198	.177
		41 to 50	.75	.283	.072
		51 to 60	.50	.327	.547
	41 to 50	0	2.75*	.462	.000
		18 to 30	31	.257	.752
		31 to 40	75	.283	.072
		51 to 60	25	.366	.959
	51 to 60	0	3.00*	.491	.000
		18 to 30	06	.304	1.000
		31 to 40	50	.327	.547
		41 to 50	.25	.366	.959

Expertise Multiple Comparisons

Multiple Comparisons

Tukey HSD					
			Mean		
			Difference	Std.	
Dependent Variable	(I) Expertise	(J) Expertise	(I-J)	Error	Sig.
ability of the product to	beginner	0	3.69 [*]	.361	.000
meet your needs		intermediate	.10	.187	.944
		expert	.03	.198	.999
	intermediate	0	3.58 [*]	.336	.000

	_	beginner	10	.187	.944
		expert	07	.148	.960
	expert	0	3.66*	.343	.000
		beginner	03	.198	.999
		intermediate	.07	.148	.960
engagement with the	beginner	0	3.81*	.370	.000
product		intermediate	02	.191	1.000
		expert	16	.203	.868
	intermediate	0	3.83*	.345	.000
		beginner	.02	.191	1.000
		expert	14	.151	.807
	expert	0	3.97*	.351	.000
		beginner	.16	.203	.868
		intermediate	.14	.151	.807
uniqueness of the	beginner	0	3.75 [*]	.606	.000
product service		intermediate	.54	.313	.315
		expert	.06	.332	.998
	intermediate	0	3.21*	.564	.000
		beginner	54	.313	.315
		expert	48	.247	.222
	expert	0	3.69*	.575	.000
		beginner	06	.332	.998
		intermediate	.48	.247	.222
ease of learning of the	beginner	0	3.94*	.474	.000
product service		intermediate	08	.245	.986
		expert	19	.260	.888
	intermediate	0	4.02 [*]	.441	.000
		beginner	.08	.245	.986
		expert	10	.193	.949
	expert	0	4.13*	.449	.000
		beginner	.19	.260	.888
		intermediate	.10	.193	.949
accessibility of the	beginner	0	3.94*	.393	.000
product service and		intermediate	15	.203	.889
assortment of channels		expert	.28	.215	.561
	intermediate	0	4.08^{*}	.365	.000
		beginner	.15	.203	.889
		expert	.43*	.160	.046
	expert	0	3.66*	.372	.000
		beginner	28	.215	.561
		intermediate	43*	.160	.046
need for support with	beginner	0	3.94*	.504	.000
the product service		intermediate	.25	.260	.772
		expert	.19	.276	.904
	intermediate	0	3.69*	.469	.000
		beginner	25	.260	.772
		expert	06	.206	.990
	expert	0	3.75 [*]	.478	.000
		beginner	19	.276	.904
		intermediate	.06	.206	.990
availability access to	beginner	0	3.75 [*]	.541	.000
support		intermediate	.02	.279	1.000

1					-
		expert	.22	.296	.881
	intermediate	0	3.73 [*]	.503	.000
		beginner	02	.279	1.000
		expert	.20	.221	.807
	expert	0	3.53 [*]	.513	.000
		beginner	22	.296	.881
		intermediate	20	.221	.807
response from support	beginner	0	4.38*	.530	.000
		intermediate	.54	.274	.205
		expert	.69	.290	.092
	intermediate	0	3.83 [*]	.493	.000
		beginner	54	.274	.205
		expert	.15	.216	.906
	expert	0	3.69*	.502	.000
		beginner	69	.290	.092
		intermediate	15	.216	.906
need for minimal	beginner	0	4.00^{*}	.490	.000
resources		intermediate	46	.253	.276
		expert	31	.268	.651
	intermediate	0	4.46*	.456	.000
		beginner	.46	.253	.276
		expert	.15	.200	.885
	expert	0	4.31 [*]	.465	.000
		beginner	.31	.268	.651
		intermediate	15	.200	.885
interaction delivery	beginner	0	3.62*	.743	.000
problems		intermediate	.38	.384	.763
		expert	.19	.407	.967
	intermediate	0	3.25 [*]	.692	.000
		beginner	38	.384	.763
		expert	19	.303	.926
	expert	0	3.44*	.705	.000
		beginner	19	.407	.967
		intermediate	.19	.303	.926
interaction speed timing	beginner	0	3.50 [*]	.448	.000
		intermediate	.35	.231	.424
		expert	.59	.245	.082
	intermediate	0	3.15*	.417	.000
		beginner	35	.231	.424
		expert	.24	.183	.559
	expert 0	0	2.91*	.425	.000
		beginner	59	.245	.082
		intermediate	24	.183	.559

Frequency of use Multiple Comparisons

	Multiple Comparisons									
Tukey HSD										
	(1)	(J)	Mean							
	Frequency	Frequency	Difference	Std.						
Dependent Variable	of use	of use	(I-J)	Error	Sig.					
ability of the product to	first time		3.64*	.342	.000					

	-				
meet your needs		regular	.02	.139	.991
	regular		3.62	.333	.000
		first time	02	.139	.991
engagement with the	first time		3.97*	.351	.000
product		regular	.14	.142	.571
	regular		3.83*	.342	.000
		first time	14	.142	.571
uniqueness of the product	first time		3.61*	.574	.000
service		regular	.23	.233	.601
	regular		3.38*	.559	.000
		first time	23	.233	.601
ease of learning of the	first time		4.12*	.449	.000
product service		regular	.12	.182	.784
	regular		4.00*	.437	.000
		first time	12	.182	.784
accessibility of the product	first time		4.00*	.372	.000
service and assortment of		regular	.13	.151	.679
channels	regular		3.87*	.362	.000
	-	first time	13	.151	.679
need for support with the	first time		4.18*	.477	.000
product service		regular	.66*	.194	.003
	regular		3.52 [*]	.465	.000
	U U	first time	66*	.194	.003
availability access to support	first time		4.03 [*]	.512	.000
		regular	.55*	.208	.025
	regular	0	3.48 [*]	.499	.000
	U	first time	55*	.208	.025
response from support	first time		4.15*	.502	.000
and a second		regular	.42	.204	.103
	regular		3.73*	.489	.000
		first time	42	.204	.103
need for minimal resources	first time		4.76*	.464	.000
		regular	.65*	.188	.003
	regular	regular	4 11*	452	000
		first time	65*	.188	.003
interaction delivery	first time	inst time	3.82*	704	000
problems	in se time	regular	68	286	053
	regular	regular	3 14*	686	000
	regular	first time	- 68	286	053
interaction speed timing	first time	motime	2 00*	474	000
interaction speed timing	motime	regular	_ 10	172	512
	regular	regulai	19 2 10*	.1/2	.513
	regular	first time	3.13	.415	.000
		inst time	.19	.1/2	STC.

Companies	£ / \$	Gross profit: sales (%)	PAT: Sales (%)	Net ROCE (%)	Gross retur n on capita l empl	ROTA (%)	asset turnover (times)	P E R	GPM (%)	NPM (%)
QVC	\$	14	7	31	oyed	16	2	2	22	7
First	£	87	- 1	2	51	- 0	0	1	325	- 1
Direct/HSBC					38			0 8		
John Lewis	£	30	31	32	165	172	6	0	1	31
lush	£	70	8	39	251	27	4	0	231	8
Ocado	£	34	1	5	165	5	5	1 7 3	52	1
M&S	£	2	1	6	8	4	3	4 3	4	1
Amazon.co.uk	\$	3	2	10	11	6	3	1 0	5	2
Nationwide	£	66	15	9	30	7	0	1	160	15
Apple	\$	9	21	10	15	36	2	8 3	14	21
GiffGaff	£	28	8	- 29	- 86	- 23	- 3	0	39	8
Coventry building society	£	43	20	13	22	10	0	0	76	20
Next	£	34	16	55	272	124	8	1	51	16
Boots UK	\$	25	3	20	103	15	4	2 9	33	3
AO	£	18	- 1	- 17	319	- 18	17	- 7 7	23	- 1
Iceland	£	7	2	14	23	6	3	0	7	2
Clarks	£	2	2	7	7	6	3	-	4	2
Wilkinson	£	40	1	13	306	10	8	0	70	1
Sainsbury's	£	5	1	7	20	5	4	1 6	6	1
Debenhams	£	13	4	13	33	9	3	1 1	15	4
Wagamama	£	8	2	8	19	5	2	0	15	2
Ted baker	£	63	9	35	189	26	3	2 4	161	9
Tesco Mobile	£	5	0	- 4	- 31	- 2	- 6	4 7	5	0
Ikea	£	44	11	9	30	7	1	0	79	11
ASDA	£	4	3	10	10	8	3	0	4	3
Morrisons	£	4	2	8	15	9	4	1 6	4	2
Krispy kremes	Е	10	6	18		11	2	1	13	6

Appendix 18: Financial Ratios

	U				18					
Littlewoods	£	41	10	73	393	93	10	0	69	10
Toby carvery	£	11	5	7	16	7	1	1 1	14	5
Asos	£	50	3	18	213	14	4	8 0	99	3
Tesco bank	£	80	14	7	49	8	1	2 7	386	14
New Look	£	51	- 1	5	- 227	6	- 4	0	105	- 1
TSB	£	59	9	10	46	7	1	0	250	9
House of Fraser	£	58	1	3	436	9	8	0	137	1
еВау	\$	78	81	35	66	69	1	3 9	347	81
DuneLm	£	49	8	84	424	66	9	2 1	96	8
B and M	£	35	6	25	103	18	3	2 8	53	6
Matalan	£	11	1	- 5	- 59	- 4	- 6	0	12	1
Costa coffee	£	18	13	22	22	16	1	1 9	21	13
Yorkshire Bank	£	92	22	95	1	0	0	1 9	68	22
Mothercare	£	9	1	9	75	10	8	1 4	10	1
NHS	£	97	- 4	- 4,125	- 86	4	- 1	0	2	- 4
Primark	£	9	8	16	14	13	2	2	11	8
Halifax	£	75	5	9	81	5	1	2 3	128	5
Ask Italian	£	18	- 4	33	92	- 21	5	0	21	- 4

Companies	£ /	IT	Knowle dge	e Operati innovation and Ons		development and delivery	relation ship	sales and distributio	ccs invest	
	, \$	cost	cost	aesthetics cost	cost	cost	cost	n	ment	
		'000	'000	'000	<i>'</i> 000	'000	'000	'000	' 000	
QVC	\$	792,	1,398,0	4,176,000	2,584,0	7,584,000	5,737,0	7,954,000	45513	
First		676.	4.387.0		12.011.		35.847.	17.683.00	/5	
Direct/HSBC	£	000	00	1,347,000	000	9,104,000	000	0,000	10721	
John Lewis	£	432,	2,323,3	865.400	30,078,	665.423.300	-	11,374,20	1.717E	
	_	700	00	,	000	,		0	+	
Lush	f	16,0 19.0	16,180,	16 033 061 260,14 1		16 300 174	3 767	394 947	81639	
Lush	-	00	995	10,000,001	7	10,000,171	5,707	55 1,5 17	08	
Ocado	f	139,	388,30	218 700	100,60	1 224 000	11 700	905 300	47791	
00000	-	000	0	210,700	0	1,224,000	11,700	10,000	2	
M&S	£	617, 200	2,169,8	1,247,800	3,460,4	8,704,000	241,100	10,103,00	41346 97	
		16.0	00		00				07	
Amazon	\$	85,0	19,047,	16,939,000	2,432,0	107,312,000	7,236,7	118,368,0	46960	
		00	000		00		84	00	598	
Nationwide	£	177,	970,00	1,395,000	790,00	3,060,000	55,000	5,050,000	16983	
		54.2	0		0				/5	
Apple	Ś	54,2 10.0	54,210,	68.089.000	18,392,	206.839.000	17,298,	225,420,0	99635	
	Ŧ	00	000	,,	000		000	00	875	
Giffgaff	£	731	7,407	821	52,127	213,048	-	284,835	95576	
Coventry		17,1	95 600	600 26 600		26,600				27955
Building	£	00,0	000	49,600,000	20,000,	617,900,000	-	907,300	0	
Society		00							-	
Next	f	1,70 3,00	2,368,4	1 703 700	214,90	5 079 100	42 600	3 752 200	21968	
Next.		0	00	1,, 00,,00	0	3,073,200	12,000	3,732,200	25000	
		2,10	1 221 0		23 7/10		16 203	118 21/ 0	11883	
Boots UK	\$	6,00	4,221,0	12,262,000	000	93,273,000	000	00	875	
		69.0	149.00		142.40				21052	
AO	£	09,0	149,00	84,300	142,40 0	721,000	45,400	701,200	7	
Icoland	£	20,9	300,80	190 200	74 600	2 884 200	2 200	2 770 500	11022	
Iceland	L	00	0	180,500	74,000	2,884,500	5,500	2,770,500	75	
Clarks	£	504,	807,50	505,000	186,00	1,750,500	700	1,175,200	73406	
		600	0		566.48				46570	
Wilkinson	£	-	-	-	7	847,350	-	1,464,475	7	
Sainsbury's	£	429,	3,307,0	1.002.000	1,227,0	27.917.000	261.000	26,224,00	10622	
	_	000	00		00			0	125	
Debenhams	£	29,0	425,00 0	172,200	57,600	2,473,300	818,900	2,224,500	10311	
		24,8	121,97			070 700			15113	
Wagamama	£	22	6	152,253	93,162	272,723	127,295	266,109	5	
		23,8	23.908.						12114	
Ted Baker	£	21,0	642	23,845,445	70,103	24,115,899	624,000	322,775	390	
	28.6									
Tesco	esco £ 11.0 35,579, 29.658.000 1,852,0		1,852,0	87,158,000	1,827,0	54,433,00	36337			
Mobile		00	000		00 07,200,00		00	0	125	
Ikea	£	-	-	-	10,388,	18,221,000	-	32,658,00	99360	
		101	26756		000	, ,		0	00	
Asda	£	300	2,075,0 00	297,300	56,600	23,496,600	508,000	21,000,30 0	37	
Morrisons	£	460,	2,385,0	895,000	305,00	18,098,000	62,000	16,317,00	67793	
	_									

Appendix 19: Customer-centricity Figures

		000	00		0			0	75
Krispy Kremes	e u	16,3 34	2,154,3 34	3,201,334	114,14 6	2,655,315	122,900	500,818	11582 70
Littlewoods	£	150 <i>,</i> 400	292,80 0	305,300	364,00 0	1,436,200	370,500	1,711,300	72173 7
Toby Carvery	£	11,0 00	637,00 0	18,000	126,00 0	2,292,000	2,000	2,086,000	85337 5
Asos	£	35,1 00,	197,90 0	212,000	579,50 0	1,163,200	87,900	1,624,400	60816 2
Tesco Bank	£	737, 200	909,90 0	1,037,200	425 <i>,</i> 00 0	1,120,100	62,200	1,012,100	68923 7
New Look	£	138, 000	365,90 0	502,900	670,40 0	1,073,800	380,900	1,454,700	66181 2
TSB	£	116, 900	496,20 0	119,500	734,00 0	837,400	59,100	1,445,600	51873 7
House of Fraser	£	86,8 00	222,80 0	136,900	94,700	576,000	433,900	473,200	29718 7
eBay	\$	238, 000	238,00 0	1,454,000	5,761,0 00	3,359,000	5,710,0 00	8,979,000	36075 00
Dunelm	£	41,5 00	186,30 0	69,000	51,000	674,800	15,000	650,700	27210 0
B And M	£	4,62 0,00 0	4,910,9 83	4,723,693	639,83 3	6,497,307	1,041,9 76	2,430,660	33063 47
Matalan	£	101, 000	259,40 0	130,000	65,500	1,185,100	900	986,500	45676 2
Costa Coffee	£	62,4 00	855,70 0	161,000	37,600	3,432,900	177,100	3,106,000	13012 37
Yorkshire Bank	£	54,9 00,0 00	222,80 0,000	89,000,000	323,30 0,000	926,000,000	-	514,600	35422 5
Mothercare	£	60,5 00,0 00	138,70 0,000	97,100,000	47,900, 000	747,300,000	26,800, 000	667,400	29928 7
NHS	£	21,0 21	1,797,3 88	33,735	222,55 6	106,785,773	-	2,242,454	27011 414
Primark	£	209 <i>,</i> 000	2,755,0 00	529,000,000	991,00 0	14,543,000	1,168,0 00	13,972,00 0	57443 75
Halifax	£	2,16 7,00 0	6,984,0 00	2,168,681,000	10,253, 000	38,030,000	2,214,0 00	52,507,00 0	18171 210
Ask Italian	£	33,0 00	116,80 0	143,700,000	23,900	309,200	74,500	233,700	14090 0

Appendix 20: G-Power Screenshot



Appendix 21: Validation survey

Dem	nographics																
1.	Sector							Manu	fact	uring		Se	rvic	е			
2.	Years of expe	rience			<1		1-3		4-6	5	6-10 >10			.0			
3.			Desig	n							Hu	mar	Re	sou	rce		
	Departme	ent	IT								Ma	nuf	actu	irin	3		
			Sales								Cu	ston	her	rela	tion	ship	,
			Marke	eting							Ор	erat	ions	5			
			Qualit	ty													
4.	Level of man	agemen	t					Low		Medi	um		High				h
5.	Relationship	with Stra	tegy	Dev	veloper	•	Implei	menter		Executo	or		N	/lea	sure	mei	٦t
6.	Gender						Male				Fe	male	ē				
7.	Experience of	f other in	dustries	S			None	1		1-3		3	3-5		>5		
8.	Age	18-21		22-25		26-3	80	31-4	10		41	-50		51-	60	>	60
9.	Knowledge le	vels											L		Μ	H	1
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	Knowledge of	wledge of user testing															
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	The framewor	k is valid	within	a knowl	edge-b	ased e	nvironn	nent									
	Metrics in the	framewo	ork are	relevant	for str	ategy	measur	ement									
Whi	ch parts of the	framewo	ork app	ear disic	ointed	or lacl	c cohesio	on?									
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orga	nisation?																
	Rate 1 to 5 fo	r not fea	sible to	highly f	easible	2							1	2	3	4	5
	Strategic fit																<u> </u>
	Sub-strategies	in the fr	amewo	ork are re	elevant												<u> </u>
	Sub-strategies	and out	comes a	are prop	erly lin	ked									<u> </u>		<u> </u>
	The framewor	к suppor	ts strat	egic fit													
	The framewor	K embra	ces risk	and und	ertaint	.y											
	The framework is low cost for strategy measurement																

Whie	Which elements would you remove or alter and why?												
	Rate 1 to 5 for not feasible to highly feasible	1	2	3	4	5							
	Outcomes												
	The framework can produce short term and long-term results												
	The framework covers effective knowledge management												
	The framework covers innovation and going ahead of trends												
	The framework enables managers to tap a true source of advantage												
	The framework can enable the development of products that beats the market												
	What impact can such a framework have on outcomes of strategy?												
Appendix 22: Informed Consent Form Sample

Informed Consent Form

A Framework for Assessing the Appropriateness of a Customer-centric Strategy and its Outcomes aimed at Improving Product Development and Service Design

The research seeks to prove that by improving experience at digital and non-digital points of interaction with manufacturing and service organisation, based on appropriate targets, customer-experience goals can be achieved. It further calls attention to the significant relationship between customer-experience and user-experience. It seeks to link environment drivers and strategy development processes with the development of a conceptual strategy measurement tool that can be programmed into management processes to aid strategic performance management. The process and tool will then be validated in manufacturing and service organizations. The research therefore seeks to propose a framework for assessing the appropriateness of customer-centric strategies in manufacturing and service organisations, and their outcomes, through the application of user-experience measurement with the aim of improving customers' experiences with products and services, enhancing business performance.

1. I confirm that I have read and understood the participant information sheet for the above research and have had the opportunity to ask questions

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason

3. I understand that all the information I provide will be treated in confidence

4. I understand that I also have the right to change my mind about participating in the research for a short period after the research has concluded (30th June 2018)

5. I agree to be recorded and for anonymised quotes to be used as part of the research project

6. I agree to take part in the research project

Name of participant: Signature of participant:

Date:





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Appendix 23: Participant information Sheet Sample

Participant Information Sheet

A Framework for Assessing the Appropriateness of a Customer-centric Strategy and its Outcomes aimed at Improving Product Development and Service Design

Information about the project/Purpose of the project

The research seeks to prove that by improving experience at digital and non-digital points of interaction with manufacturing and service organisation, based on appropriate targets, customer-experience goals can be achieved. It further calls attention to the significant relationship between customer-experience and user-experience. It seeks to link environment drivers and strategy development processes with the development of a conceptual strategy measurement tool that can be programmed into management processes to aid strategic performance management. The process and tool will then be validated in manufacturing and service organizations. The research therefore seeks to propose a framework for assessing the appropriateness of customer-centric strategies in manufacturing and service organisations, and their outcomes, through the application of user-experience measurement with the aim of improving customers' experiences with products and services, enhancing business performance.

Why have I been chosen?

You have been chosen to participate in this research because you are a staff directly involved in the strategy management of your organisation, or a customer to the case research under consideration. Therefore, you have access to the kind of information required in conducting the research.

Do I have to take part?

Participation in this research is not compulsory and completely voluntary.

What do I have to do?

All you have to do is sit pretty and give your opinion on questions asked during the interview.

What are the risks associated with this project?

The identified risk of data security will be managed by ensuring only the researcher has access to the data collected, which will be deleted once analysis is completed. Furthermore, the names of the participants and the institution will not be mentioned in the research.

What are the benefits of taking part?

Participating in this research will enable your organisation improve customers' experience using a simple, research-based framework. The research will cover all areas of strategic management of product development and service design.

Withdrawal options

You can decide to withdraw from this research at any time. If you change your mind after providing data for the research, you can also request for the data you provided to not be used in the research.

Data protection & confidentiality

Data collected will be treated with high security and confidentiality. They will be stored where only the researcher can gain access during the course of the research. At the end of the research, all data collected will be destroyed.

What if things go wrong? Who to complain to?

If things go wrong, complaints should be made to the researcher. If there is need to contact a higher authority, complaints can be made to the researcher's director of studies whose contact has been provided at the end of this document.

What will happen with the results of the research?

The results of the research will be used solely for drawing conclusions on the applicability and relevance of the framework developed in manufacturing and service organisations.

Who has reviewed this research?

The research has been reviewed by the Researchers Director of Studies Dr Richard Anderson, and team of supervisors.

	Task Name	Duration	Start	Finish	er 2015		November 2(15		Januar	y 2016		Marc	h 2016			May 2016	Jhai
				5	mber	01 October	01 November	. 01	ecember	01.Jan	uary	01 February	01 M	arch	01 April		01 May	rt –
					14/09	28/09 12/10	26/10 09/11	23/11	07/12 21	1/12 04	01 18/01	01/02 15	0/67 20)	2 14/03	28/03	11/04 2	5/04 09/0	
_	M001 coursework	21 days	Thu 22/10/15	Thu 19/11/15														
~	M34BSS Lectures	51 days	Fri 02/10/15	Fri 11/12/15														
~	M34 BSS Presentation	21 days	Fri 13/11/15	Fri 11/12/15			U	l										
-	M34BSS Exam	11 days	Mon 21/12/15	Mon 04/01/16														
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9	Objective 2	79 days	Tue 15/12/15	Fri 01/04/16														
~	M23CDE Lectures	42 days	Thu 21/01/16	Fri 18/03/16														
~	M23CDE Coursework	16 days	Fri 05/02/16	Fri 26/02/16														
6	M23CDE Coursework 2	16 days	Thu 10/03/16	Thu 31/03/16														
8	M25AAE Lectures	47 days	Tue 19/01/16	Wed 23/03/16														
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17	Methodology	66 days	Tue 31/05/16	Tue 30/08/16														
22	PRP	22 days	Thu 01/09/16	Fri 30/09/16														

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Task Name	Corrections on previous output	Develop questionnaires and user tests	Complete ethics form	Do PACT analysis	Write Paper	Distribute Questionnaires	M010DL	Develop first version of model	Test product usability	7 Transcribe user tests	Conduct strategic analysis of the case studies	 Conduct regression analysis on financial results 	3 Conduct correlationn analysis on questionnaires	 Assess each user test based on usability metrics developed 	5 Outline usability problems	5 write up data gathering chapter	 Assess the outcomes of the companys' strategies 	8 Write up data analysis chapter	Dpdate paper) submission	PRP	
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Certificate of Ethical Approval

Applicant:

Chinomso Nwagboso

Project Title:

A Framework for Assessing the Appropriateness of Strategy and its Outcomes, aimed at Improving Product Development and Service Design

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

Date of approval:

21 November 2016

Project Reference Number:

P45519

Appendix 26: Interview Questions for Framework Testing

The interviews with the customers were guided by the following questions:

- 1. How would you describe your experience with the organisation so far?
- 2. What are your key points of interaction with the organisation?
- 3. How have these experiences influenced your decision to stay/continue/leave?
- 4. What areas have you found especially satisfying?
- 5. Why do you find these satisfying?
- 6. How has your experience been in terms of these 12 target categories? (refers to items on the framework)
- 7. Do you expect these to be priorities in improving your experience?
- 8. Would your experience have been better if any of these were different?
- 9. What areas of your current experience differ from your previous experience?
- 10. Having experienced and are still experiencing services with the organisation, how would you assess the targets on the framework on a scale of low medium and high? Basis of assessment being preference and self-knowledge

The interviews with the managers and business owners were guided by the following questions.

- 1. How would you describe the areas/stages/ of interactions between customers and the organisation?
- 2. What are the major units in the organisation that are dependent on for information, and or give information to?
- 3. How important is customer-experience to the organisation?
- 4. What areas of customers' experience are considered in the strategies implemented?
- 5. What is currently being done to achieve this?
- 6. How often are customer-experience strategies reviewed/changed?
- 7. What has the result been so far?
- 8. Are there documents/statistics you can give to show this performance?
- 9. How are the strategies different from those employed last year?
- 10. How are the results this year different from last year?
- 11. What does the organisation do to meet these 12 customer-experience requirements? (refers to items on the framework)
- 12. How have these customer-experience targets been met? (refers to items on the framework figure 8.2)
- 13. Is the organisation consciously attempting to check meet these requirements?