ABSTRACT:

In light of the heterogeneity of scholarly publications on the subject of transformational government (t-government), this paper examines research trends and assesses methodologies used to investigate the topic with the aim of analysing directions for future research. A comprehensive analysis of T-government research published in four Chartered Association of Business Schools ranked journals within the field of Public Administration, e-Government and Information System is presented. The paper outlines research directions for further inquiry to promote the formulation of much needed theoretical constructs and approaches to research that would help bridge the existing gaps in knowledge in the area of T-government.

Studying T-Government: A Review of the Existing Methodological Approaches and Future Outlook

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1 Introduction

Underpinned by the technology revolution (Deloitte, 2019), digital Darwinism has continued to reshape socio-economic needs and promote situations where governments are forced into implementing bigger change programmes than ever before (Omar, 2018; Omar et al., 2017). Traditionally, a government is designed to deliver services and policies (Deloitte, 2019). However, such function has evolved in the past 20 years and the influence of Information and Communication Technology (ICT) has been a dominant force in such evolution. Hence, improving operational efficiencies is embedded as the core ethos of modern governments (Mahmood et al., 2019). In this context, governments are expected to design policy that enables digital transformation through the implementation of ICT-led policy instruments, often referred to as "Transformational Government" or T-Gov (Weerakkody & Waller, 2016). Both academics (e.g. Layne and Lee, 2001; Scholta et al., 2019) practitioner organizations (e.g. United Nations; Deloitte) consider T-Gov as characterising an advanced state of digital government development. Because the term transformation represents a fluid concept that is often used to signpost different contexts by practitioners, politicians and scholars (Bannister and Connolly, 2011), the definition of T-Gov warrants thoughtful consideration. One of the early definition states that T-Gov is a technological innovation and shift to new entrepreneurial culture from inefficient, unaccountable bureaucracy (Blackstone et al., 2005). According to Bannister and Connolly (2011), T-Gov is a mixture of e-Government, business process reengineering and business scope revaluation. Meanwhile, Janssen and Shu (2008) describe T-Gov as a government that is transparent, accountable, efficient, and agile. Commenting on Janssen and Shu's definition, Bannister and Connolly (2011) poses the question if the qualities of T-Gov are "absolute or relative" – i.e. if transformation is complete when agility is achieved?

And if yes, then how is agility defined? To debate this is beyond the scope of this paper and for the purpose of constraining the context, these two definitions are adopted literally.

Within a short period of time, the T-Gov agenda has become more imperative than ever, thus encouraging increasingly heavy investments on various digitally led initiatives. Mukhoryanova (2016) reports on investments by governments around the world on TGov initiatives. Examples include: United States government - USD36.6 billion since 1992, Russian government - USD0.18 billion since 2002 and South Korean government - USD1.6 billion since 2003. In the UK, over GBP3.2 billion has been invested on digital government initiatives until 2018 (UK.Gov, 2018). This includes the National Programme for Information Technology (NPfIT) and Common Agricultural Policy Development Programme (CAPD). Meanwhile, 1,129 digital government projects worth USD292.7 billion in 135 countries were funded by the World Bank (World Bank, 2017).

Unfortunately, not all of these investments came to fruition. Many of the initiatives had failed to realise their objectives (Mahmood et al., 2019, Alzahrani et al, 2017, Weerakkody et al., 2016). In the UK for instance, the NPfIT (i.e. an ICT-led policy instrument aimed to transform the UK National Health System by sharing of patients records and self-booking GP/hospital appointments) that was terminated in 2013 has been listed among the biggest fiascos in the world (Parliment UK, 2013). The failures of various TGov initiatives in the UK public sector alone accounts for over 20 billion GBP of taxpayers' money. Besides these examples, the adoption of an ICT-led mechanism in Europe to manifest its Common Agricultural Policy Development Programme (CAPD) created issues that eventually impeded its implementation (Kuhmonen, 2018). To quote more examples – i.e. the attempt to digitally transform healthcare and defence sector in the U.S. and the plan to establish a common government portal in Australia and Canada had demoted change (Mahmood, Weerakody and Chen, 2019). In fact,

though an analysis of 30 years of U.S. literature on the public sector, Kraemer and King (2006) concluded that very limited change has been attained through ICT-driven government reform.

Besides wasting the tax-payers' money, these failures also facilitate the decline of the citizens trust in government (Mahmood et al., 2019). This scenario demands insights from the experts. Given the nature of T-Gov as a field it has lured investigations from scholars representing different research or academic fields, especially those from public administration (PA), information and communication technology (ICT) and information system (IS) disciplines. For example, 9,095 conference proceedings and peer-reviewed journal articles were published and indexed in Scopus since the past four decades, of which more than 90% of publications were made within the past two decades. (see Figure 1).
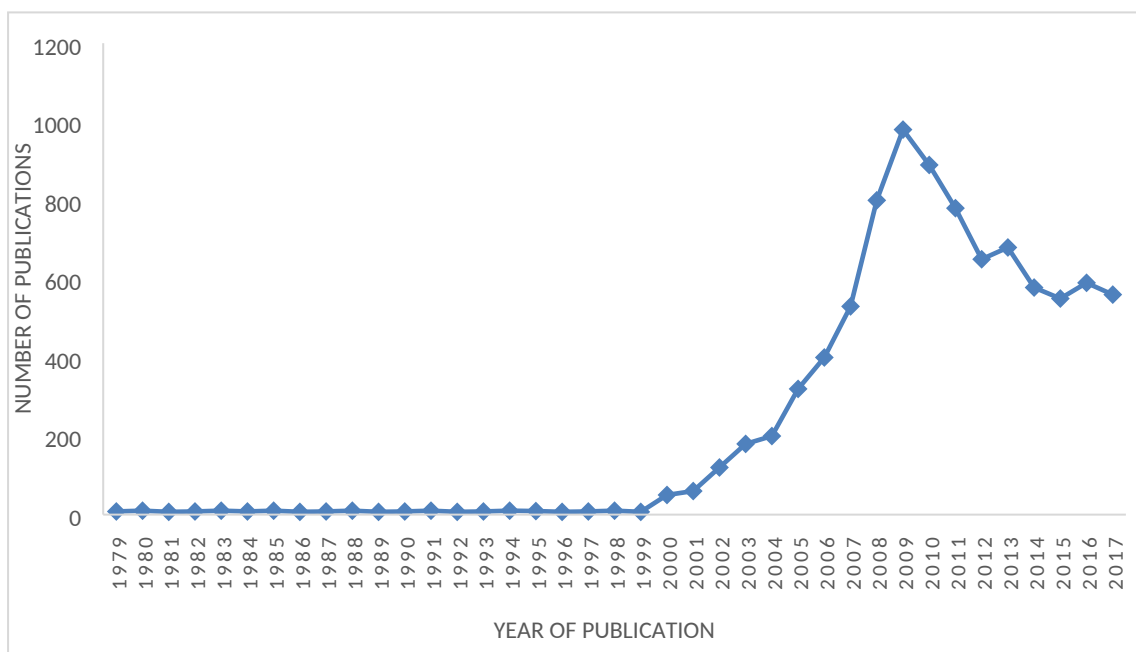
Figure 1: T-Gov publications from year 1979 to 2017

The plethora of scholarly works particularly during the last two decades have crowded many publication outlets. Focusing on various aspects, these works were built upon myriad of

methodological approaches, revealing insights and practical guides, yet failing to develop a common frame of reference for analysing T-Gov.

In light of this heterogeneity and based on the belief that scientific judgement should be informed by the knowledge constructed in previous studies, we advocate that it is imperative to conduct a critical, integrative review of scholarly publications in the field of T-Gov.

Thus, we performed a review of the methodologies used by more than 400 papers published in four Chartered Association of Business Schools four stars and above-rated journals from the field of Information Systems (IS), public administration (PA) and e-government. Our aim is to identify the tendencies in T-Gov research and to advise the directions of future works. Essentially, the research provides a framework to guide practitioners and researchers assess the field by evaluating the main focus of T-Gov research and the methodological approaches used to study the topic as described in leading journals, as well as the potential links between the research problems investigated and the findings.

The rest of this papers is organised as follows. The next section offers a review of published articles concerning T-Gov research and analyses the gaps in the methodological approaches used in these studies. In the third section, we outline a frame of reference for a research methodology for the study of T-Gov, followed by the fourth section that outlines the analysis of the result of empirical data obtained for this research. Finally, we discuss the findings and present the conclusion that also comprises research limitation and suggested future direction for the study of T-Gov.

2   The Methodological Gap in T-Gov Research

The rapid evolution of technology has facilitated the exponential growth of the various ICT-led transformation efforts in government. Within the period of just under two decades, many governments around the world have moved from provision of online information to online

participation (Ingress et al., 2018; Lee-Geiller and Lee, 2019). Various ICT-led projects have been initiated and implemented to support these transformations. However, not all projects have been successful; many failed projects have wasted public resources and tarnished citizens trust (Mahmood et al., 2019). Such context signposts the need for new knowledge and practical insights into T-Gov.

Gustafsson and Bowen (2017) emphasies that for new resaerch to unveil new knowledge and practical insights, it should be built on the existing research. Until recently, there have been limited attempts to understand how researches in T-Gov were approached in order to enhance existing knowledge. Some of the seminal works in this respect are as follows. Rivera (2006) focuses on the meaning of e-government and critiques it in national public administration context. Yildiz (2007) published a study on e-government research limitations and suggested the need for more empirical studies to allow the development of new theoretical arguments. Heeks and Bailur (2007) studied the research philosophy and theories used in e-government papers published in major conference at the time concluding the same. A decade later, Medaglia and Zhu (2017) investigated citizen engagement with government through digital media and proposed an approach to frame the relationships between relevant constructs that indicate future avenues for research. A year later Wirtz and Daiser (2018) did a meta-analysis of 129 quantitative papers in peer-reviewed T-Gov journals and proposed directions for future T-Gov research using quantitative methods.

Omar et al., (2016) suggest that PA and IS are the two interlacing disciplines in the field of T-Gov. As such, the methodological issues discovered in PA research could easily be inherited by T-Gov research. McCurdy and Cleary (1984) assert that research in the PA field suffers methodologies weaknesses. The claim was supported by Stallings and Ferris (1988) who confirm that methodolgies used within this field are often inappropriate to comprehend the complex context of PA. They criticise the limited evidence used by researchers to confirm the

validity of techniques and the excessive use of case study methods or non-empirical approaches. Many scholars agree that this issue is common among the IS/PA journals. For instance, Rodriguez, Alcaide and Lopez (2012) highlights that although the number of research in T-Gov has notably increased since 2000, the focus on understanding the government's perspective rather than analysing citizens's opinion remains as majority.

Although both qualitative and quantitative studies are used to study the T-Gov phenomon, descriptive-qualitative studies are evidently preffered over quantitative study (Rodriguez, Alcaide and Lopez, 2012). The qualitative method seen in T-Gov research was often associated with descriptive studies that were based on weak, casual data (Brower et al., 2000). In fact, Wirtz and Daiser (2018) argue that T-Gov literature demands more quantitative empirical research to enable theory development. Medaglia and Zhu (2017) and Alcaide et al., (2017) advocate that the adoption of quantitative methods to study T-Gov is more precise and scientifically relevant to scholarly work. However, we believe that such statements will not undermine the credibility of qualitative approaches in generating scientific knowledge and powerful insights - if it is appropriately employed. In general, qualitative resaerch shows inductive orientation based on epistemological inductivism and constructivism, and ontological subjectivism, while quantittaive research comes from a deductive, positivist position (Wirtz and Daiser, 2018). Quantitative research is often associated with advantages that it generally suits theory testing and the generalization or replication of findings (Creswell, 2014), and less susceptible to subjectivity as compared to qualitative research (Zikmund et al., 2013). Nonetheless, we argue that quantifying social phenomena may involve a complex conceptualization and operationalization processes. Hence, quantitative approaches also entail potential disadvantages.

In his recent work, Wirtz and Daiser (2018) outlines the disadvantages of quantitative research as follow: wrong sample sizes that disallow generalization of findings, method bias – i.e.

research participants provide information for both dependent and independent variables, endogeneity – i.e. variables are influenced by the unmeasurable factors, and scaling of data that lead to distortions. This leads us to the argument about research rigor. A rigorous research encapsulates a strong research design and appropriate method of answering research question(s). Hence, scholars such as Lincoln and Guba (1991) and Yin (1994) agree that a rigorous research entails valid and trustworthy findings. The process of ensuring rigor in research starts with research design. Yin (2018) asserts that research design is the blueprint for any research. As a research blueprint, a research design determines the method of gathering relevant evidence that will effectively answer the research questions. Practical implications of a research in particular is derived from a coherent research design (Fountain, 2003). The pre-mature start of an investigation without proper details on how the research and its evidence should be approached, as well as the re-purposing of the same research design to fit different studies always lead to unreliable results or failure in addressing the research question. Through an assessment on rigor and relevance criteria of research on T-Gov publications, Gronlund and Andersson (2006) found that rigorousness of T-Gov research has improved over the early period from the mid 1990 to the time of their research in 2006. However, Mintzberg (2014) argues that overly concern on doing research correctly often deludes insightful findings. His argument poses a question of whether T-Gov research suffers the consequences of focusing on 'rigor' or methodologica correctness' that eventually limits insighful findings. This may explain why there continues to be gaps in theoretical and practical insights and related failures in T-Gov initiatives; this embodies what we seek to investigate.

As mentioned earlier, T-Gov is a hybrid discipline made of IS and PA disciplines. This uniqueness offers researchers a range of theories that could be applied as an analytical lens in their studies; hence, the selection is broad to the native IS or PA theories. In fact, social theories such Institutional Theory and Structuration Theory have also been used to investigate T-Gov

(Omar et al., 2016; Bannister and Connolly, 2015; Moody et al., 2010). The use of Institutional Theory to study T-Gov has be criticised for structural biasness (Bannister and Connolly, 2015) – i.e. the theory limits explanations situated at individual or same level of analysis. To overcome this limitation, some scholar use the fusion concept – for instance by combining the theory with Structuration Theory (see Omar et al., 2016). We posit that the fusion of concepts such as this one would maximise cross-disciplinary academic debate, inviting new knowledge and novel insights. Therefore, for an interdisciplinary field such as T-Gov, "substantive significance of a theory should be given priority over "statistical significance". This is another aspect that this research is seeking to explore.

Considering these questions, this article seeks to provide a general overview and a foundation for future research in the field of T-Gov, by analysing the articles published in four CABS rated journals to obtain evidence on the preference of methodologies and their main focus.

3   Methods

3.1   Article Selection

Bandara, Miskon and Fielt (2011) assert that the underlying structure and method of conducting literature reviews defines the pathways for successful research outcomes. Hence, systematic and structured literature reviews are recognised as approaches that facilitate the production of a thorough and rigorous analysis (Webster & Watson, 2016). This is conditioned by the adoption of a comprehensive and replicable literature search strategy that is fundamentally rested on the relevance of the selected publication outlets, keywords, and time-span (vom Brocke et al., 2009). To do this, the researcher is first required to select the relevant publication outlets to perform the search, before outlining the strategies to be deployed, such as the keywords and publication date (Webster & Watson, 2016). This is to ensure that relevant studies with regard to specific topic of research are obtained without bias (Denyer & Tranfield,

2009) as well as the reliability, comprehensiveness and rigorousness of the method itself (Wohlin, 2014).

Our research took place in the leading journal publishing outlets. Following Levy and Ellis (2006) approach, these journals were identified based on the ranked profile. This is because ranked journals are likely to include the major contributions (Webster & Watson, 2016). In this case, the Chartered Association of Business School's journal ranking list was used as reference to cherry-pick the Information Systems (IS), public administration (PA) and e-government outlets containing digital-led transformation research in the public sector.

In line with Baskerville and Myers (2002) and Medaglia and Zheng (2017), two of the top IS journals as indicated by the Senior Scholar's Basket of Journals of the Association for Information Systems (AIS) were selected. They are "Management Information Systems Quarterly (MISQ)" – i.e. CABS four stars and "Information Systems Journal (ISJ)" – i.e. CABS 3 stars. MISQ was also selected because it published the greatest number of articles on the management and use of information-technology resources, including the IT based services. It also discussed the professional issues affecting IS as a whole and its implication towards organisations and society. Meanwhile, the selection of ISJ was also based on the fact that it publishes the largest number of articles that integrate technological disciplines with social, contextual and management issues. Other journals in this field were not considered due to their limited publications in this field as revealed from our keyword search.

Similar to Medaglia and Zheng (2017) in their investigation on the use of social media in government research, we refer to the E-Government Reference Library (EGRL 12.0), which is a comprehensive database of e-government references that is maintained at the University of Washington's Information School (Scholl, 2016) to select journals in the field of e-government. As the result the "Government Information Quarterly (GIQ)" journal – i.e. CABS three stars, was selected to collect evidence. Finally, two CABS four-star journals were selected to

represent PA publication outlets: "Public Administration Review (PAR)" and "Journal of Public Administration Research and Theory (JPART)".

To gather evidence, three databases were used to perform the search. They are Science Direct, Wiley Online Library and JSTOR. The search was made based on the two sets of the keyword combination and Boolean operators, in either the title or the abstract of the articles:

(i)   "Organi*ation* change" AND "Technology" AND "Public Sector";

(ii)   "Technology" AND "Public Sector" AND "Transformation".

The symbol "*" was used to ensure that all different possible permutations such as Organisation, Organization, Organisational, and Organizational were discovered. In the first set of keywords string, "Organisation change" phrase was used as one of the keywords together with "Technology" and "Public Sector" to ensure that the result captures all research pertaining technology-related changes in public sector organisations. Meanwhile, the second set of keywords string ensured that the search leads to all articles on technology-related transformation in public sector. The term "public sector" was preferred over "government" because it comprises citizens-service provision entities owned and operated by the government, where public policy instruments were implemented.

The search was bracketed starting from the year 2006 until 2015 i.e. ten years for the first round, before expanding until the year 2017 in the second round of search – rounding the results within twelve years of publications. This resulted in a total of 588 items.

The criteria of exclusion used to detect the scholarly literature for analysis are as follows: the articles at the outer set of journal and conference proceedings categories; the studies with no data analysis; and redundant papers. This second round of filtration resulted in 496 research articles. Table 1 summarises the steps taken in the literature selection procedure. Meanwhile, table 2 list the search results.

Table 1: Literature selection procedure

Steps	Description	Sum
1	Search in: The top two IS journals as indicated by the Association for Information Systems (AIS) (Management Information Systems Quarterly and Information Systems Journal); The core journal in the e-government field (Government Information Quarterly); the top two PA journals (Public Administration Review and Journal of Public Administration Research and Theory) using Scopus, employing two sets of keywords: (i) "Organi*ation* change" AND "Technology" AND "Public Sector"; (ii) "Technology" AND "Public Sector" AND "Transformation"	586
2	Apply exclusion criteria to the result obtained from step 1.	496

Table 2: Search Results by Journal

Journal	GIQ	ISJ	JPART	PAR	TOTAL
GIQ	224	57	59	136	496

3.2 Analysis Strategy

The analysis is divided into two: (i) descriptive analysis, and (ii) thematic analysis. The descriptive analysis elucidates category of research methods employed by each study (i.e. qualitative, quantitative or mix) and number of strategies deployed for the data collections. The results of each descriptive query were derived from both – the individual journal as well as the combination of all journals and translated into graphs and charts for illustration. The outcome of this analysis provides an objective result for this research regarding the most frequent methodology and strategy used to do research on the topic. The results were evaluated against the research themes which were identified through a thematic analysis.

Content analysis was performed to aid the thematic analysis. The same method was adopted by Dolezel and Morrison (2017) in their work. Content analysis, which can be approached in three ways (i.e. conventional, directed and summative) – is a powerful approach that can be used to reveal the overview of the whole datasets comprehensively and systematically

(Marying, 2000). To perform the content analysis, we first imported all of the articles to NVivo to facilitate the content analysis. The word frequency query performed generated a report containing 101 different words based on the following parameter: each word contained at least four alphabets, and these words are from the top eighty most frequent words used in the papers that we gathered. This report was then used as a basis of the next query, i.e. the text search, where the twenty most frequent words displayed in the report were searched individually from the 498 abstracts. Each result was displayed in a 'word tree'. This assisted the researchers in sense making of the themes that the articles represent.

These were then followed by thematic analysis, where similar themes were grouped together, forming a bigger and more general theme. The themes such as "management capacity" and "leadership" were grouped as "actors", "resources" and "policy" were grouped as "structures", and all of the theoretical models or frameworks were grouped as "models".

During these processes, the researchers often had to refer back to the body of the articles to ensure that they gauge the same understanding as what the articles tried to imply.

To see the connection between research rigor and ability to provide practical insights, we first evaluated the rigor of the study, followed by skimming for practical insights claimed by the papers. Adopting Gronlund and Andersson (2006)'s method to evaluate research rigor, the papers were assessed in terms of methods used over time and maturity of T-Gov as a field measured through the involvement of other disciplines. Methods here refers to the study design, including the coherency of research aim, research problems and strategies used to collect evidence as well as how the evidence was analysed. Meanwhile, the maturity was measured according to the nature of the discussions and evidence used in the study and can be categorised into three stages - i.e. philosophical, anecdotal, cluster. A less mature field tends to encourage philosophical studies, where arguments are mainly speculated or be based on philosophy due to lack of empirical data and theories in the field. Whereas a more developed stage will

encourage anecdotal studies due to availability of data - yet lack of clear focus leads the studies to be based on emerging features grounded on the researchers' interests or disciplines. The most developed stage is called clustering where the researchers look for similarities across different contexts. A simple checklist of "Yes" and "No" was developed using MS Excel to record the results of this evaluation.

4   Findings

Transformational Government (T-Gov) has steadily acquired greater significance in terms of facilitating government efficiencies in delivering services to the citizens and encouraging their participation in governments' decision-making process. Figure 1 in the Introduction section shows that over 90% of the T-Gov publications, including e-government and information technology-enabled change in public sector research were published between year 2000 to 2017.

As explained in the methodology section, the 'frequent word' query was used as an initial step to begin the thematic analysis on the papers. As the result, 101 different words appeared in the result. These words were used repeatedly for at least 80 times in across the 496 "Abstracts". However, in this article, we list the top 50 words which appeared in the query results as shows in Table 3.

Table 3: Word Frequency Query Results

Word	Count	Word	Count	Word	Count	Word	Count	Word	Count
government	1021	Development	243	technology	205	also	165	state	133
public	900	Organizational	237	governance	199	theory	162	evidence	131
information	464	New	235	Use	198	case	160	agencies	128
research	392	Service	233	Based	193	literature	154	authors	128
policy	334	Paper	222	Sector	186	important	151	factors	127
study	320	Social	220	Findings	184	systems	149	administrative	126
management	309	Administration	211	Model	178	two	149	implementation	126
article	294	Organizations	211	framework	175	change	148	leadership	125
data	272	Services	210	Using	171	governments	144	approach	123
performance	267	Local	205	Analysis	167	results	136	political	122

These words were then used as the basis of the next text search query to form a word tree, to see how the words related to the articles. This gave us a general overview of the potential themes of the research – i.e. the primary concerns, subject matter or focus of all the 496 papers. The exercise gave us various themes, indicating a broad focus of the research. Some of the examples included implementation of online systems in government to assist service delivery and encourage citizens participation, challenges in T-Gov implementation, the gaps in existing T-Gov research, theories to study T-Gov and suggestion to improve T-Gov implementation. In making sense of the themes and connections, we then referred back to the body of the articles. After three steps of grouping and re-grouping themes, the final themes of "capacity" and "model or framework to study T-Gov" emerged. More than 60% of the papers employed "capacity" as their main theme, while the remaining papers were based on the second theme.

Dissecting the themes, we found that research focusing on government capacity largely ground their debates around the capacity of government actors and the capacity of government resources and structures in supporting T-Gov implementation. The arguments raised include the degree of actor empowerment such as authoritative and allocative power of the actors (e.g. Pieterson et al., 2007; Gizaw et al., 2017; Liou et al., 2011; Panagiotopoulos et al., 2012; Wilkinson & Gerolami, 2009), communication to improve awareness or understanding towards a particular transformation (Graffy, 2008; Hackler & Saxton, 2007; Wang & Kapucu, 2008; Yang & Pandey, 2009) and governance (e.g. Dawes, 2008; Farazmand, 2009; Keiser, 2010; Wu & He, 2009) and the repercussion of resource devolution against big investments for technology-led-changes in the public sector.

Meanwhile, the papers focusing on the government resources and structures investigate their effectiveness in facilitating the transformation process, and made suggestions on how these could be improved. The discussions also include the informal norms that shape the institutional

cultures which impede the T-Gov agenda, and policies related to the T-Gov agenda (e.g. social inclusion policy, data privacy policy and system security policy).

The second theme – i.e. model or framework to study T-Gov embeds more academic and theoretical discussions. These researches look into the existing theories, model and framework that are used to investigate T-Gov and debates on their strength and weaknesses. Most of the arguments were centred on enhancing the IT/IS models to aid the transformation process, particularly in increasing the uptake of ICT-led policy instruments by both the government organisations and citizens, as well as enhancing their effectiveness to facilitate the attainment of policy objectives. For instance Nabatchi et al. (2017) suggest a framework for examining how direct citizen participation could assist with identifying and understanding public values. Kim et al. (2007) presents a commitment transformation framework for analysing the change in actors' commitment during the transition from escalation to de-escalation in information technology led change projects, and Ghobadi and Mathiassen (2015) proposes a framework explaining barriers to knowledge sharing within agile software development teams. All these challenges, themes and sub-themes identifies are outlined in Table 4.

Table 4: Research Themes

Main Themes	Sub-Themes	Research Focus	Concerns	Sample Papers
Organisational Capacity	Capacity of Actors	Authoritative / allocative Power	Ability of the actor to dictate actions and manage resources in order to facilitate the T-Gov implementation or adoption	Pieterson et al., 2007; Gizaw et al., 2017; Liou et al., 2011; Panagiotopoulos et al., 2012; Wilkinson & Gerolami, 2009.
		Communication	The initiatives performed to signify T-Gov implemenation and adoption.	Graffy, 2008; Hackler & Saxton, 2007; Wang & Kapucu, 2008; Yang & Pandey, 2009
		Governance	Means to govern actions and structures in facilitating T-Gov implementation.	Dawes, 2008; Farazmand, 2009; Keiser, 2010; Wu & He, 2009.

	Capacity of Structures	Government Policies	The political pressures in surrounding the institutional environment that influence the directions of T-Gov in a particular context	Heinrich, 2012; Krebs & Pelissero, 2010; Lee et al., 2011; Nabatchi, 2012.
		Culture or Practice in Organisation	The influence of organisational culture and practices on T-Gov implementation and how they facilitate or hinder the formation of new culture that assists T-Gov implementation	Bhuiyan, 2011; Klischewski & Askar, 2012; Mergel, 2013; Picazo-Vela et al., 2012.
		Organisation Resources	The discussion on the availability of resources such as IT facilities and funds to support T-Gov implementation	Dorner, 2009; Ferro & Sorrentino, 2010; McNeal, Schmeida, & Hale, 2007; Rorissa, Demissie, & Pardo, 2011; Tapia, Maitland, & Stone, 2006; Ball, 2009.
T-Gov Model / Framework	-	-	The development or improvisation of IT/IS models to aid the T-Gov implementation process	Nabatchi, Sancino and Sicilia (2017); Kim, Pan, and Pan (2007); Ghobadi and Mathiassen (2015)

Regarding the type of research carried out in the articles published on T-Gov, we observed a preference for the use of empirical methods (more than 80%) over non-empirical methods. Most of the non-empirical studies are found in PAR. Majority of the empirical studies are descriptive analysis, followed by explorative, correlational, experimental and observational.

The percentage distribution of the research articles confirms that qualitative methods appeared to be the most preferred (67% of the total papers). Half of this amount were published in GIQ, followed by PAR and JPART. Only 3% of all articles have employed mixed methods – of which more than 44% of them were published in PAR and 31% in GIQ. Among the qualitative studies, those most frequently used are case study and comparative analysis. Meanwhile, most of the quantitative research used regression analysis. The results indicate that GIQ is the most

active journal, as it contributed 244 articles from the search result, while MIS Quarterly appeared to be the least active in the same parameter.

There were nine data collection strategies identified across the 496 articles. These strategies are: scenario building, survey, case study, interview, participants observation, secondary data (or archival research), focus group, process tracing and digital ethnography (or netnography). Within the qualitative context, which was the most popular strategy, interviews appeared to be the most utilised approach to gather empirical evidence. This is followed by the archival research strategy where the researchers based their evidence on secondary data. The third popular data collection strategy is observation. Unsurprisingly, only one study adopted netnography as approach for data collection. Table 5 shows the number of articles against the number of strategy(s) employed. This indicates that majority of the T-Gov research employed a single strategy to collect research data.

Table 5: Data Collection Strategies Distributions by Journal

Journal	1 strategy	2 strategies	3 strategies	4 strategies	5 strategies or more	Total
GIQ	139	74	22	7	2	244
ISJ	29	21	7	0	0	57
JPART	47	10	2	0	0	59
PAR	91	36	6	2	1	136
Total	**306**	**141**	**37**	**9**	**3**	**496**

More than 60% of the papers explicitly explained their research design and described the approaches used to perform their studies. The rest of the papers explained their research design implicitly in three sections – i.e. introduction, literature review, and/or results/findings. For these papers – of which mostly are qualitative studies - it was hard for us to evaluate the rigorousness of the studies. All the 496 papers proposed at least one practical insight and suggest at least one way forward on how research into T-Gov could be improved.

5   Discussion and Conclusion

T-Government is generally considered to be an enhanced stage of e-government where the focus is on reforming public administration to enhance the efficiency, transparency and effectiveness of public service delivery (Rodriguez et al., 2006; Weerakkody et al., 2010; Cordella & Temini, 2015; Twizeyimana & Andersson, 2019). This is partly to promote public engagement in government decision making process and policy making (OECD, 2003; Bonsón et al., 2012; Tursunbayeva et al., 2017). In this context, the research preferences in the articles considered in our analysis arise from sociological-technical perspective of the implementation and adoption of ICT-led transformation, particularly as policy instruments in government administration. The conclusions of this research indicate a variety of focuses and approaches used to investigate and analyse the T-Gov phenomenon across various contexts.

This study contributes to the existing empirical literature by describing the status of T-Gov research against a period spanning two decades, and proposing a frame of reference to help practitioners and researchers evaluate T-Gov as field of study. We discuss the limitations in T-Gov research in terms of the theme and of its gradual shift with regards to the top T-Gov journals that publish studies in this respect, highlighting the preferred methodological approach applied.

It was evident that the interest in T-Gov research increased exponentially in the last two decades, commencing around the year 2000. Academic journals and conference papers notably provide the main outlet for these studies, with the former offering greater scientific rigour due to strict peer-review process to which the studies are subjected.

An improvement was noticed in terms of transparency of the epistemological stance of the researchers since Heeks and Bailur's (2007) study on the perspectives, philosophies, theories, methods, and practice of e-government research. This helped us in identifying and evaluating

if the research adopted a coherent research design, which hugely influence the status of 'research rigor'. We believe that employing critical realism and relativism as the researchers' philosophical stance partly influence the diversification of research focus, data collection strategies and contexts of research (across all continents). Based on Gronlund and Andersson (2006)'s "maturity" measurement criteria, it can be posited that T-Gov research has surpassed the anecdotal level of maturity and entered in to the highest level of maturity.

The domination of the social constructionists in T-Gov research that justify why majority of the studies were approached qualitatively also indicate a positive movement in the maturity level of T-Gov as a research field. We know that T-Gov is a hybrid field where various disciplines interlace. The evidence demonstrate various perspectives were used to study T-Gov issues. In early 2000, most of the researchers employed native IT/IS theories to examine their research problem. Recently, sociologist views such as concepts from Institutional Theory and the Theory of Structuration, as well as marketing concepts from Means End Chain Theory and PA concepts of Public Value were also borrowed and applied to answer the research questions. We discovered that these papers had generated many fresh and useful insights for practitioners and T-Gove researchers alike.

Despite of the use of various theories to study the T-Gov phenomenon, some dogmas remain unchallenged. It was argued that T-Gov forms the instrument set to implement public policies (Waller and Weerakkody, 2016), and public policies address societal problems (Kuhmonen, 2018). To harness these, more complex measures of heterogeneities as well as the institutionalisation of internal and external pressures could be considered. This is because T-Gov encompasses not only technology but also people and social constructs. For instance, use of technology in the T-Gov agenda shapes and is being shaped by actions, conditioned by socio-cultural parameters and resources. Hence, adopting the view of a single theory to study T-Gov adoption – e.g. Technology Acceptance Model or Unified Theory of Acceptance and

Use of Technology (UTAUT) - will indicate user intentions to use the system and predict the subsequent usage behaviour, but will not explain the implications of non-technology elements on such behaviour.

Besides reconsidering the theoretical lens to adopt in studies, we also would like to draw the reader's attention to the mistreatment of digital enabled transformation of public sector institutions as a technology tool, instead of a policy instrument. Our findings challenge many of the norms that have been discussed in T-Gov studies. This is not due to the soundness of the research but the very terminology that has been used to discuss digital enabled transformation in the Public Sector. The main purpose of government is to develop, implement and administer public policy decisions on behalf of the community for which it has responsibility. However, with the evolution of the public management model and the emergence of e-government concepts, the major purpose of government has been skewed by an assumption of government as a service industry.

It was observed from the evidence that researchers are becoming increasingly aware of the multiculturalism and complexity of the public sector settings in today's world. This had helped them in striking a balance in situating themselves in the context – i.e. distinguishing their personal values or opinion from what is evident.

In regard to the qualitative method, Cresswell (2013) suggests five approaches to qualitative inquiries: narrative research, phenomenology, grounded theory, ethnography and case study. These approaches are the hallmark of qualitative research (Marshall & Rossman, 2016) due to their ability in involving the social world in research (Creswell, 2007). However, our investigation on the papers using "qualitative" studies reveals less than 50% of the research had utilised these hallmark approaches in their studies (i.e. two ethnography, two phenomenological, six grounded theory, and 149 case study researches). Having said so, we throw reasonable doubt that some of these researches are non-qualitative, thus their correctness

and contributions are questionable. In the future, we suggest that researchers approach the taxonomy of "qualitative" and "quantitative" with caution, since the terms "quantitative" and "qualitative" are often used interchangeably with "deductive" and "inductive". Mintzberg (2005) emphasises that not all deductive approaches to theory building can be classified as quantitative studies, and not all induction approach falls in the remit of qualitative study. We reiterate that the misuse of these taxonomies could easily influence the rigorousness of a research.

Although quantitative scholars encourage the adoption of quantitative research to study T-Gov, we argue that such study type would limit research contributions. In the analysis, we found that quantitative studies limit their contributions on the final propositions and correlations as the focus was constrained mainly on falsifying theories. Very few studies provide insights on developing new theory. Hence, for studies in T-Gov, we encourage researchers to utilise mix-methods which would allow the creation of theoretical arguments to progress existing knowledge and build new theory based on empirical data and objective arguments. On the other hand, without discrediting the contributions made by the existing T-Gov studies, we suggest that qualitative studies should continuously revive the field of T-Gov research to facilitate the development of new theoretical lenses since the existing theories were commonly borrowed from other disciplines.

A single strategy for data collection was used by most of the T-Gov research (306 papers), whereas 141 papers combine two strategies to collect data for their research. The finding indicates a worrying situation, as it is inconsistent with Yin's (2018) good principles of data collection. The use of multiple strategies for data collection is important to ensure that it meets the purpose of doing qualitative enquiry, especially in a case study, and allows the researcher to cover all the unfolding events within the determined study period. Most importantly, the use of various data collection strategies would help the researcher to better triangulate the data,

which underpins "validity" and "trustworthiness" of studies that condition rigorousness of research. With the improved access on data (e.g. online provision of data), we suggest for this to be improved in the future, although this practice would challenge the provision of resources and time. With the fluctuation of information on Internet sites such as newsgroups, blogs, vlogs, forums, social networking sites, podcasting, and photo sharing communities, as well as the increase openness of government data (i.e. publicly published content such as reports, statistics and video records), we encourage for netnography to receive more attention from researchers as a strategy to collect data – particularly to understand citizens' perception towards T-Gov and their emerging needs.

On top of strategies for data collection, we found that it is important to reveal how T-Gov studies were conducted across time. Although this is not examined in detail in the present study, this aspect could signpost vital message to the research community. We discovered that almost all articles represent cross-sectional studies (i.e. 456 articles). This reveals that longitudinal study is a less favourable option among researchers in this field. We strongly argue that this underpins the reason why existing T-Gov studies are unable to promote relevant and practical insights that advance new knowledge in the field. The essence of T-Gov is to encapsulate change – and change is contextual in nature as it involves time, social actions and circumstances (Saldana, 2003). Henceforth, the adoption of longitudinal studies will depict the temporal perspective of change, while cross sectional studies will give a snapshot of the big picture helping better contextualise the complexities of T-Gov. This type of study is especially recommended to researchers who are keen on understanding the social interactions and interplays between humans and technology in the implementation and adoption scenario of T-Gov. In accordance with Giddens (1984), the social system of culture and practice are reproduced by actors drawing a set of rules and resources upon practices that produce and re-produce social systems, where the interactions could exist out of time and place. Hence,

employing a longitudinal study will provide an opportunity for the researchers to observe these interactions and understand their implications on each other. Nonetheless, there is no finite definition for the length of study to be categorised as longitudinal. Rather, the length is determined by the existence of inherent properties of change, i.e. the contradictions. The following questions could help researchers to determine if longitudinal study is required: (i) does the movement of time explain how we live our life? (Levine, 1997); and (ii) is time inseparable from change? (Sztompka,1993). If the answers to both questions are 'yes', then a longitudinal study would help researchers to capture through a long-term and in-depth engagement of the research participant.

To sum up, the review presented in this article provides a summary of T-Gov studies, highlighting the themes, methodologies and data collection strategies employed in 496 articles published in four CABS star rated publication outlets. Explanations and clarifications are given where possible. Knowledge gaps and future research opportunities were outlined together with a frame of reference of how T-Gov research should be approached in the future to enrich the knowledge of the field. An academic research should not be a speculation, opinion, or clever journalism, but producing replicable work from which insightful conclusions can be drawn. Therefore, it should be grounded on actual evidence, and produce contextual-independent conclusion that is reproduceable. Producing new knowledge by building on the existing one is also critical in the research process. Hence, adopting "rigor" in methodology (there are some arguments raised on the taxonomy of 'rigour' i.e. it should be read as 'relevance') is crucial in determining research correctness on which insightful contribution will emerge.

6   Limitations

Even though this study has presented several arguments based on its findings and draws corresponding conclusions for T-Gov research, it also carries limitations. This research used

articles published between 2006 to 2017 in the four- and three-stars CABS journals. This could be a research limitation since the potential of having more numbers of relevant, high quality researches that were published in other outlets such as "International Journal of Electronic Government (IJEGR)", "Public Polity" and "Transforming Government: People, Process and Policy (TGPPP)" was discounted. However, in view of the systematic approach, taking into consideration the evidence published in the star-rated journals, we are nevertheless confident that the final set of studies provides significant contributions. Apart from that, we are also aware of the loss of information that is created through aggregating information, utilisation of certain keywords, as well as potential overlapping of study content and clustering (theming) criteria, which may lead to partial indistinct allocations. Since we were conscious of this constraint while allocating, aggregating and filtering the articles, we were able to reduce the degree of risk associated with this limitation to an acceptable level by cross referencing and carefully checking the key findings. Future research should bear these limitations in mind when undertaking research of similar nature.

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