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Woodcock, A.

Published version deposited in CURVE August 2015

Original citation & hyperlink:

Woodcock, A. (2014) Late adopters and laggards: should we care?. The International Journal of Design Management and Professional Practice, volume 7 (3): 53-61.

<http://ijgmpp.cgpublisher.com/product/pub.239/prod.46>

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VOLUME 7 ISSUE 3

The International Journal of

Design Management and Professional Practice

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THE INTERNATIONAL JOURNAL OF DESIGN MANAGEMENT AND PROFESSIONAL PRACTICE
www.designprinciplesandpractices.com

First published in 2014 in Champaign, Illinois, USA
by Common Ground Publishing LLC
www.commongroundpublishing.com

ISSN: 2325-162X

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Late Adopters and Laggards: Should We Care?

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Abstract: To capture new markets and remain at the forefront of innovation, designers may concentrate on designing for early adopters—most frequently characterised by those who are well-educated and positioned in higher socioeconomic groups. In so doing, the needs of this niche market might reduce consideration of the need for inclusive product and service design, especially when new services are influenced by the functionality of high technology products; for example, those without the latest mobile technology may not be able to benefit from online services and information (such as transport and traffic information, online shopping, and banking). With changes in socioeconomic climates and demographics, there is an urgent need to take into consideration the needs of late adopters and laggards to design inclusive systems which recognise that not everyone can, wants to, or is able to adapt to new technology and ways of working and living. Without such focus, disenfranchisement and exclusion will widen. After a brief review, the paper looks at where and how design is positioning itself to meet the societal challenges posed by laggards and late adopters.

Keywords: Technology Acceptance, e-inclusion, Design, Social Inclusion, User centred and Participatory Design

Introduction

Pearson and Young (2002) stressed the importance of technology and technical systems and their integration into every aspect of our lives. For Western societies it is difficult to overestimate the impact technology has at all levels of society – at home, at work, in leisure and transport, in sickness and in health. Technology drives growth and economic progress at an ever increasing rate (Hunt 1999) and affects everyone as it changes the fabric of society (Edison and Geissler 2003). However, some people are uncomfortable with the changes, do not enjoy the uncertainty it brings or are reticent or unable to embrace new tools and ideas (Edison and Geissler, op cit).

Dimitrova and Chen (2006), amongst others have undertaken research to understand early adopters and their characteristics. Research has considered how people can be persuaded to adopt new technologies (Agarwal and Prasad 1999; Igarria, Iivari, and Maragahh 1995) leading to the development of technology adoption (Davis 1986; Davis 1989) and technology diffusion (Rogers 2003) models. The theories of planned behaviour (Ajzen 1991), reasoned action (Fishbein and Ajzen 1975) and behavioural intentions to use (e.g. Hill, Smith, and Mann 1987) have evolved to explain the uptake of technology and technology based innovations.

The emphasis on early adopters and the factors which influence or increase uptake of new innovations has deflected attention away from key questions concerning late adopters and laggards – especially in terms of the quality of life of those who, for many reasons do not engage with latest innovations. Simply measuring the level of penetration of products and technology hides information about how the technology is used, and the impact different ways of using technology might have on different part of society (second level digital divides). This paper explores the trend to design for early adopters and the role of the design in providing tools and methods to support e-Inclusion.

Definitions

As a subset of inclusivity, e-Inclusion is a term which is used to explain the use of digital technology to break down barriers of race, gender, disability, class etc. It emphasizes the interaction between people, contexts and digital tools. Designers need to understand this relationship firstly, because many of products, through their use of technology or reliance of

technological services, may be ‘exclusive’ or favour certain groups of users over others, and secondly because much research through, by and into design seeks to breakdown digital divides. Diffusion research (Rogers 1962 and 2003) is central to ideas of technology adoption. Based on the seminal work of Ryan and Gross (1943), it explains how an idea (or technology) is communicated across channels over time among and by members of a social system. In this, the role of the innovators and early adopters are key in taking up, enthusing and promoting latest technology to others. The characteristics of all adopter groups are summarized in Table 1.

Table 1: Characteristics of Adopters

Group	Percentage	Characteristics
Innovators	2.5%	Venturesome, desire for the rash, the daring, and the risky, control of substantial financial resources to absorb possible loss from an unprofitable innovation, able to understand and apply complex technical knowledge, able to cope with a high degree of uncertainty about an innovation
Early adopters	13.5%	Integrated part of the local social system, greatest degree of opinion leadership, serve as role model for other members or society, respected by peers, successful.
Early majority	34%	Interact frequently with peers, seldom hold positions of opinion leadership, deliberate before adopting a new idea
Late majority	34%	One-third of the members of a system, pressure from peers, economic necessity, skeptical, and cautious
Laggards	16%	Possess no opinion leadership, isolates, point of reference in the past, suspicious of innovations, innovation-decision process is lengthy, and resources are limited

The 5 stages of adoption are depicted as:

1. An awareness stage, where a potential user is exposed to an innovation but does not have a lot of information about it.
2. An information stage where the potential user becomes interested in the new idea and actively seeks out more information
3. An evaluation stage where, having gathered sufficient information, the individual considers its usefulness in present and future scenarios, and decides whether to try it.
4. A trial stage, where the user tries an innovation e.g. perhaps on a try before you buy or money back basis, or experiments with part of the service (for example a system or a game with limited functionality) prior to purchase
5. The adoption stage is the last stage, where the user has committed to purchase, uses the systems, and may recommend it to others (diffusion occurs)

The laggards and late majority, together form approximately 50% of the population. Crucially, attention in design and innovation is placed on the innovators and early adopters, who are seen as the quickest to take up new technology, who demonstrate the use of the product in their daily lives and act as diffusers.

However, this emphasis has led to a point where designers may concentrate their attention on designing for early adopters. It has been shown that this group may differ significantly from the rest of the population in terms of their educational attainment, socio economic status, technological awareness and tolerance of problems/technical failures. In an educational context, attempts have been made to address this imbalance by asking students to design for people unlike themselves. This usually means to design for the elderly, those with disability and/or poor

disability and/or poor levels of literacy, i.e. people unlike themselves. However, the time scales provided in undergraduate courses may be too short to undertake the in depth ethnographic study needed to develop an understanding and appreciation of the ‘dissimilar and unknown.’ For example, consider Bagnall, Dewsbury and Somerville’s (2005) discussion of personae.

The emphasis on early adopters has also led to an overemphasis on simple explanations of technology adoption and diffusion. Notably, Molnár (2003) distinguished three main types of digital divide:

1. Early adoption. Here there is a straightforward access divide, known as an early digital divide. People either have or do not have a device (such as a mobile phone or internet connection).
2. The take-off period, where there is a usage divide, also known as a primary digital divide, which describes the difference between users and non users.
3. Saturation, where the divide stems from the quality of use. This is also known as a secondary digital divide, and describes the consequences of having or not having technology for different types of users.

Initial research into new technologies focuses on simple measures of uptake which can be calculated as the number of people who buy, use or have access to a service. For example, Chen and Wellman (2004) cited that the number worldwide internet users has grown from 4.4 million in 1991 to 10 million in 1993, to 40 million in 1995, to 117 million in 1997, to 277 million in 1999, to 502 million in 2001, and to more than 600 million in 2002. With a global penetration rate of less than 0.1 percent in 1991 to over 10 percent population in 2002, and forecasts of between 11 and 15 percent for 2004. Obviously rate of technology adoption is not constant across different countries, and some countries may display differences in the technology they favour. Chen and Wellman (2004) noted, in the 8 countries they studied that Japan led on the development of the mobile Internet, Korea in broadband connections and the UK in digital TV diffusion. While the first level digital divide is concerned with access, the second divide looks at differences in users and then in usage, and the consequences of this.

Taking as an example older Internet users, in Germany Gescheidle and Fisch (2007) revealed that less than 10% of those over 60 years of age had access to the Internet, yet technology diffusion was rapid in other age groups. Bonfadelli (2002) found a similar age gap in Internet use in Switzerland when comparing those aged 14–29 years and those over 50: a discrepancy of 10% in 1997 (14% usage among the younger group vs. 4% among the older group) had grown to 21% in 1998 and 35% at the beginning of 2000. Although, the elderly have been considered laggards in the adoption of innovations in information and communication technology (ICT), recent figures have seen the rise in the use of the Internet by this group. For example, in Germany the percentage of Internet users among those aged 60+ grew by 570% from 2000 to 2007, compared to 172% growth among those aged 20–29 years (Gescheidle and Fisch 2007).

Chen and Wellman (2004) noted that gender, socio economic status, life stage and geographic location (i.e. rural vs. urban) all effected the digital divide and that this was widening and deepening in developing countries. Widening, in so far as few people actively use the Internet and deepening, in terms of the consequences for those of not being on line.

Second Level Digital Divide and Social Inclusion

Encouraging as the rise in ‘silver surfers’ may be, the figures may disguise a second level digital divide concerned with the way in which ICT is being used. Increasing numbers of recent innovations have become embedded in the Internet, including newsgroups, instant messaging, and podcasting. When considering the usage of these innovations as opposed to the Internet

itself, the elderly are again lagging behind. Understanding the second level use divide requires more subtle theoretical and methodological perspectives.

The reasons for this 'lag' may be explained by the complexity of these new services and the low esteem in which their functionality is held by the elderly (Mikkonen, Väyrynen, Ikonen, and Heikkilä 2002). While younger users appreciate the entertainment delivered on their mobiles and accept the complex technology, the elderly are more concerned with staying in touch with those close to them and reaching help in the case of an emergency (Kurniawan 2006; Kurniawan, Mahmud, and Nugroho 2006). To accommodate this reduced need, devices have been designed with limited functionality (such as mobile phones with just four call outs), yet this now excludes the elderly from other services they may wish to access and benefit from. More in depth research needs to be undertaken to determine what new opportunities/affordances technology could bring and how the latent requirements of non-user groups may stimulate development of new services and products. This is being explored for example through detailed studies of people's lives (Leikas 2009), involving more qualitative research approaches (McCabe and Innes 2013).

Of more importance is the reduction in the quality of everyday life experienced by those who do not have access to the latest technology. For example, without the latest mobile technology citizens may not be able to reserve, access or pay for parking spaces near to their destinations, or find out latest transport information. Those without internet access will not be able to benefit from financial services, such as on line banking or participate in e-government. The digital divide goes further as it is not just related to technology, but to literacy and the structuring of social institutions.

The digital divide is comprised of multiple fractures—gender, age, ethnicity, uncertainty of financial/ living/ work conditions, literacy, education and disability—all of which impinge on social access to digital technologies. Mancinelli (2007) stressed that e-inclusion concerned effective participation of both individuals and communities in all dimensions of the knowledge based society and economy through their access to ICT. Gallie and Paugam (2002) revealed gaps in ICT literacy and access in Europe (EU) are already a real barrier in people's lives. For example, Mancinelli (2007) reported an EU survey conducted in 2007 which showed that over a third of EU citizens do not have access to a computer and 37% between the ages of 16 and 74 have no computer skills. In order to reduce these gaps the EU has initiated a number of policies specifically targeting e-Inclusion, empowerment, building social capital and skills training in certain population groups such as young and older people, women and people with disabilities. It is beyond the remit of this paper to discuss such policies; rather attention will now focus on the role and potential for design in relation to technology acceptance and e-inclusion.

e-Inclusion and Design Strategies

Both design and ergonomics can make contributions to e-inclusion and helping transitional societies (Woodcock 2013). This section discusses the strategies which could be adopted by designers to ensure that laggards and late adopters are considered, before laying down a challenge to the design community to engage more directly with funding agencies and NGOs to secure adequate and sustainable funding for design led societal innovation.

Little attention has been given in the design literature to laggards, late adopters or designing for transitional societies. Given that these groups form 50% of the population, this neglect is both surprising and worrying. However, there is an abundance of work being conducted in this area if the wider remit of e-inclusion is considered, i.e. the design of the broader social structures and functions of the institutions. This research may not be used currently to inform design practice or education. As such, undergraduates may just consider their design in isolation, or not consider the ways in which design could make a difference to wider societal contexts. Yet many of the tools (outlined in the last section of this paper) have arisen or been used in design contexts. Corea (2000) noted the need to start with understanding the social environment and to build up

relationships to develop behaviours intrinsically motivated to engage with such technologies, with the goal of being innovative rather than replicating.

Design is well placed methodologically and strategically to make society, institutions and products more democratic, equitable and socially inclusive, if attention was focussed away from consumerism. A range of approaches are possible to address e-inclusion and social divides, from a solely product design perspective, through to city wide innovations and the design of new integrated communities (as described in DRS Conference, Bangkok, 2012 and Design Principles and Practices Conferences, Tokyo, 2013). These are summarised in the following Table 2.

Table 2: Characteristics of Adopters

Strategy	Description	Reference
Designing for the technology acceptance curve	Companies adopt business strategies for different stages of the curve, i.e. 'endorse, curate, integrate, economise, play and refresh', with Apple being cited as a 'curating' company; HP as an 'integrator'; Dell as an 'economiser'	(Canada, Mortensen, and Patnaik).
Designing for specific groups such as laggards and late adopters	Bonfadelli articulated the need for " <i>research based on a user perspective looking at technology as embedded and shaped socially</i> " as exemplified in the design of mobile phones for the elderly	(Bonfadelli 2002, 81; Karnowski, von Pape, and Wirth 2008).
Meaningful user engagement	Users can be engaged as, for example, users, informers, codesigners or experts in either codesign or participatory methods, leading to the design of more user centred design products	(Sanders and Stappers, 2008).
Improving usability and inclusion	Through following ISO UCD guidelines, inclusive design and universal design practices	(Clarkson, 2003; Story, Muller and Mace, 2011).
Participatory ergonomics	Here the end user is involved 'in the change process so that he/she becomes an advocate and an active change agent rather than the passive recipient of the process.'	(Lewis, et al. 1988, 756).
Macroergonomics and socio-technical system design	in which ' <i>the components of the system (people, technology, environment) cannot be thought of in isolation from each other</i>	(Imada 2002; Robertson 2001, 69).
Transition theory and sustainable design	These focus on transitions in sociotechnical systems and regimes and practices especially in relation to environmental issues	(Hargreaves, et al. 2011).
Living Labs	These provide a real-life test and experimentation environment where users and producers co-create innovations, which include periods of co-creation, exploration, experimentation with communities of users and evaluation	http://www.openlivinglabs.eu/aboutus

Conclusions

It has been argued that recognizing and confronting issues relating to e-inclusion are of central importance and relevance to human society and that the undue emphasis placed on designing for early adopters and measuring rate of uptake of technology has led to a neglect of those who have to work through technological and societal transitions without the buffering of social, financial and intellectual capital.

The design community are responding to the needs of late adopters and laggards in a variety of ways such as inclusive and universal design; design for traditionally excluded user groups (such as those with disabilities and the elderly); development of ethnographic and participatory /cocreation approaches which lead not just to a design solution but offer a deeper understanding of certain groups, and are in themselves empowering; and lastly through applying these techniques and design activity to address community wide issues.

Recommendations

Design has a significant, if not central role to play in creating inclusive futures. However, design can be very insular, which reduces its impact and engagement with wider societal issues. Inclusivity, should be of central importance, not just in terms of product design, but in terms of the wider e-inclusion debates. This means recognizing weaknesses in current approaches which focus on high end products and looking at more difficult/new and expanding markets, not simply as niche opportunities, but in terms of enhancing quality of life and societal change.

This requires increasing the awareness, ability, understanding and interest of future designers in not just shaping products, but the world. This requires greater empathy with end users, more challenging design briefs and topics and courses which are structured and allow time for in depth study, and research led design briefs. Companies already operating in such markets should promote and evidence the wider impact of good design and participation in terms of improvements to quality of life (not just in terms of financial value added).

To support this greater investment in design related and design led projects at national and international level is needed, with a commitment to continuation and transfer of projects at the end of funding to ensure sustainability and adoption by local leaders. Finally, national and international communities of practice need to be developed which enable close and comfortable working with end users and change agents (such as local and national authorities).

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ISSN 2325-162X

