Association for Information Systems
AIS Electronic Library (AISeL)

UK Academy for Information Systems Conference Proceedings 2013

UK Academy for Information Systems

Spring 3-19-2013

Investigating Barriers to Trust in Mobile Devices

Jiten Makan
University of Salford, j.makan@edu.salford.ac.uk

Maria Kutar
University of Salford, m.kutar@salford.ac.uk

Azham Hussain
a.hussain@edu.salford.ac.uk

Follow this and additional works at: http://aisel.aisnet.org/ukais2013

Recommended Citation
Makan, Jiten; Kutar, Maria; and Hussain, Azham, "Investigating Barriers to Trust in Mobile Devices" (2013). *UK Academy for Information Systems Conference Proceedings 2013*. 52.
http://aisel.aisnet.org/ukais2013/52

This material is brought to you by the UK Academy for Information Systems at AIS Electronic Library (AISeL). It has been accepted for inclusion in UK Academy for Information Systems Conference Proceedings 2013 by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

INVESTIGATING BARRIERS TO TRUST IN MOBILE DEVICES

Jiten Makan
University of Salford, Salford, Manchester, M5 4WT
j.makan@edu.salford.ac.uk

Dr. Maria Kutar
University of Salford, Salford, Manchester, M5 4WT
m.kutar@salford.ac.uk

Dr. Azham Hussain
University of Salford, Salford, Manchester, M5 4WT
a.hussain@edu.salford.ac.uk

Abstract

There has been a rapid increase in the use of mobile devices for interaction with web based tools and applications, driven in large part by the rapid shift towards smartphones. At the same time, it is recognised that the factors such as the volume of eCommerce, transition to online banking, and broad uptake of social media applications, require users to have confidence in their trustworthiness and security. As the ways in which users are able to use and access the Internet shift, this research has focused on establishing a greater understanding of the relationship between the three constructs of risk, trust and confidence and how they impact upon Internet use. This short paper examines the issues surrounding these constructs, identifies the key shifts and challenges with mobile devices; and discusses how risk, trust, confidence influence the use of mobile devices for accessing the Internet. Key findings include the variance of user behaviour according to device type, and the greater influence of usability on use of mobile applications for activities that require greater levels of confidence.

Keywords: Trust, Confidence, Mobile Devices, Internet Usage

1.0 Introduction

A complex relationship exists between the constructs of risk, confidence and trust, all of which influence the way in which users interact with Internet based technologies. These constructs are inherently related and difficult to neatly pin down. Risk is exposure to a proposition of which one is uncertain, and is characterised by the importance of outcome to the individual involved (Holton: 2004). Trust is a tool for decision making in a situation of risk, therefore for a trust situation to exist, the perception of risk must be present. Confidence is also a decision-making construct, but one that is based on very specific reason based judgements; judgements whereby

protection measures such as guarantees, contracts and so on exist, so allowing for the effective elimination or reduction of the risks involved.

It is acknowledged that the rapid growth in the use of mobile devices for Internet use, fuelled by developments in smartphone technology, are affecting the ways in which users behave online. 'The mobile phone is ubiquitous. More mobile phones exist than personal computers, and the interactive digital capabilities of smartphones, and more recently tablet computers allow users to connect not just socially, but to engage and transact directly with brands and retail services' (Stone: 2012).

In this paper we discuss the current results arising from an on going diary study which examines trust, confidence and Internet use. So far, the study highlighted a variance in Internet use according to the device (mobile versus desktop / laptop) the participant uses to access it, and furthermore indicates that usability is a key inhibitor for use of mobile devices for transactions that are perceived to rely on confidence.

2.0 Trust and Confidence

In his work, Luhmann (2000) states that although closely related, trust and confidence are two separate constructs entirely. They are both understood to be 'tools' for decision-making; they both involve judgement; they both can be based on factors such as experience, familiarity, competence, intentions and, most crucially, both share the premise of positive expectations (Siegrist, Gutscher & Earle. 2005; Adams 2005; Cofta 2007; Grönlund & Setälä 2011; Uslander 2002).

One of the crucial differences between trust and confidence is that although both are effectively tools for decision-making, the latter – confidence – is a process that is more customary and habitual in nature (Fukuyama 1995; Misztal 1996). Within a confidence situation, it is not uncommon to expect a decision to be made without a conscious consideration toward potential consequences; in other words the formation of habit (Chiu et al. 2012).

The nature of trust and characteristics outlined within the surrounding literature would suggest that non-customary, non-habitual situations such as marriage would be 'handled' by trust driven decision-making processes (Siegrist, Gutscher & Earle 2005). Trust is critical in a relationship where one doesn't have direct control over the actions of the trustee (Moorman, Deshpande, & Zaltman, 1993). To go further, this means that there is no means of influence, merely a reliance on your perception of their intentions and this is why the understanding exists that trust is not about the transactions but about the relationships involved (Cofta 2007). This aligns to the idea that 'trust gained through experience with an offline company positively influences key customer perceptions' (Lee, Chung & Lee 2012); in short 'trust is transferred from the offline channel to the online channel (Bock et al 2012).

Interestingly, and crucially risk is necessary for the development of trust (Luhmann 1979; Gambetta; 1988; Sztompka 1999). If the individual sees little risk of a negative outcome then trust is not necessary (Blanchard, Welbourne, & Boughton, 2011). This can be

'The key distinctions between trust and confidence are these: Trust involves risk and vulnerability, it is important when familiarity is low. Confidence, on the other hand, is based on high levels of familiarity' (Siegrist, Gutscher & Earle 2005). The objects of trust are persons (or person-like entities), whereas confidence can be had in just about anything (Ullmann-Margalit 2004; Hamilton & Sherman 1996).

'Another notion from which trust is to be differentiated is confidence or reliance. The latter notion does not typically involve imputing of intention; they lend themselves more readily to the subjective probability approach. I may rely on, or have confidence in something (a bridge for example), or in someone' (Hardin 2004). Trust, in contrast, relates only to people' (Hardin 2004; Ullman-Margalit 2004; Uslander 1999)

It is recognised that when a decision can be made based on past behaviour rather than personal risk or uncertainly, then it is a confidence driven decision. Confidence decisions are governed by base rate frequency and have a very specific referent in comparison to trust, which embraces many wider elements and information sources (Adams 2005). Confidence involves reason based judgements that relate to the

probability of a specific event occurring. Risk is outside the persons' scope (Ullmann-Margalit 2004). This contrasts to trust – as described in the earlier subjections – in that trust can only exist where there is a perception of risk (Luhmann 1979; Gambetta; 1988; Sztompka 1999), and for a risk to be a 'risk' it has to be considered important to the individual involved (Holton 2004).

Within this paper, trust is understood to be a broad referent and scope judgement on a person (or person-like-entities) that is characterised by risk, a specific lack of information, lack of influence and by the need to 'take a leap of faith' from what is known to what is unknown (Adapted from Adams: 2005). Confidence is seen as the belief that certain future events will occur as expected and is determined by specific reason-based judgement(s) on experience, evidence, familiarity and crucially measures of protection (Adapted from Siegrist, Gutscher & Earle 2005). These concepts are examined in the light of users' reflections in the context of mobile devices and Internet usage.

3.0 Mobile Devices

Mobile has quickly become ingrained in society due, arguably, to the flexibility of anywhere/anytime usage (Coursaris et al 2012). There is a premise of a mobile device being movable, portable and according to the work of Rosas et al (2003), with an implied context of use that is personal as opposed to shared. These refer to those devices which facilitate some form of electronic communication or, as Pica (2004) and Karikhara (2002) explain, those that share the property of creating a virtual environment of interaction.

Without explaining in great detail the shifts in trends and capabilities for mobile devices – everything from mobile phones, smart phones, netbooks and tablet computers – it can be observed that 'over the last ten years mobile phones had a remarkable evolution. From a simple device for voice communication, it became a full-blown multimedia device with multiple features and appealing services' (Perrucci et al: 2009). Taking this into account, it becomes understandable that Brodkin (2008)

reports the expectation that the mobile phone will be the primary device used to access the Internet by 2020.

4.0 Usability of Mobile Devices

It is recognized that usability is an important consideration for interface designs, as applications that are difficult to use require increased cognitive efforts from the user and may result in user error, increased time to complete a task, frustration and disappointment (Hussain and Kutar: 2012)

Mobile devices present unique challenges for interface designers; low-resolution screens, limited screen-size, limited input options, slow processing and limited connectivity (Zhang & Adipat: 2005). In addition, some websites are unable to be accessed via mobile devices as they are designed for full-scale computers or laptops with little or no regard for the mobile user (Yevgen et al., 2007).

A study by Jones (1999) found that mobile users spend more time trying to location information rather than simply browsing like computer users. This would have a detrimental impact on the aspect of usability, which is defined by the ISO as the extent to which a product can be used by specified users to achieved specified goals with effectiveness, efficiency and satisfaction in a specific context of use.

Hussain (2012) considers the data entry requirements of the user as one of the central challenges of usability for mobile devices. He explains that manufactures have implemented many wide and innovative techniques in an attempt of overcoming the screen-size limitations and data-entry requirements, for instance, pointers, scroll-wheels, mini-keyboards and more recently built-in voice recognition applications. Despite such innovations, the physical limitations of mobile devices arising from size continue to present challenges to effective interface design. There exists no prior research which examines whether these limitations also influence whether users can trust, or have confidence in applications on mobile devices; the work described here aims to explore this gap.

5.0 Study Design

The study utilised a diary approach, adopting characteristics from the diary-interview approach of Zimmerman and Weider (1977). This advocated a diary-interview technique that allows a detailed gathering of participant observation data without actual observation taking place. The process adheres to the following path: (i) short interview, (ii) diary study followed by (iii) an in-depth interview. The diary was largely in a free-text format with two guiding questions and a small amount of prescriptive information required. This structure is understood to provide a level of freedom for the participant, therefore enhancing the one of the advantages of the diary method – the possibility for unexpected discovery (Nezlek: 2012)

To date, ten participants have completed the diary over the required seven consecutive days, recording their based social, domestic and pleasure uses of the Internet, using their typical devices, in the typical places in the typical way. After diaries were returned and analysed, the follow-up semi-structured interview took place with the central focus of adding richness to the data that the diary wouldn't necessarily achieve independently. A consideration was made to ensure that the gap between diary completion and follow-up interview was kept to a minimum in order to reduce the possibility of problems associated with memory recall (Alaszewski: 2006). The loose diary study structure was designed to facilitate for serendipitous discovery, and is something is further enhanced through a carefully designed follow-up semi-structured interview.

6.0 Results and Discussion

One of the most insightful aspects that materialised regarding mobile device and Internet usage was how participants' usage varied in a limiting way depending on the access method. Each of the ten participants were daily Internet users, although three (participants E, G and I) stated that they never accessed the Internet through a mobile device, despite having capable smartphones. Two of these three explained that they had no need to access the Internet on such a basis and the third (participant I) citing usability issues – 'too annoying'.

Of the seven remaining participants, only one user (participant C) used the Internet in the same manner whether via a mobile device or desktop device. The other six participants took a selected approach of only accessing limited / insignificant content. To quote from participant B 'I use my laptop for the important stuff, only really use my phone for Facebook and even then its just newsfeeds'. A similar stance of using the mobile device for 'insignificant information' and other devices for everything else from shopping to banking was largely identical between the majority of participants. Each of these six participants upheld the rationale as relating to usability, in the form of various comments from; "too small" (participant D), "too awkward" (Participant A), and "too faffy" (Participant F). The diary data initially suggested that it was possible that security concerns were the overriding factor that limited mobile use to 'minor' information. However, the follow-up interviews provided deeper insight into this variance and the explanation given by many participants was the poor usability of mobile devices, in comparison to laptop / desktop computers. Interestingly, security concerns were elements that hindered use or were of concern when participants used regular devices such as laptops or desktop PC's. Even where one participant identified security as a concern when using mobile devices, it was considered to be of secondary concern to usability. Overall, usability was the central inhibitor to Internet usage through mobile devices.

7.0 Conclusions

This study of trust, confidence and Internet usage uncovered a variance between what activities participants were willing to engage in using mobile devices and that which they were not. The diary – viewed independently from the follow-up interviews – suggested that the issue impacting upon Internet use via mobile devices was lack of confidence. This finding arose stems from the way in which the majority of users restricted the scope of their Internet activities via mobile devices for elements such as shopping, and online banking. The interviews however, shed light on alternative reasons behind this variance of use, which predominantly centred upon usability aspects, with only one participant citing security concerns (and even here stating that it was a secondary concern to usability aspects). However, wider research shows that

distraction severely impacts mobile device usability. The recent study by Coursaris et al (2012) explains quite distinctly that mobile use is potentially impacted by age, culture, etc. but more crucially 'auditory, motional and visual distraction have significant negative impact on the perceived efficiency and effectiveness of mobile device use'. These elements then transpire to affect user satisfaction and overall intention of use.

It can be logical to suggest that what is put forward from the participant interviews as being usability concern associated with the physical constraints of a mobile device are in fact more likely to be wider distractions – during the context of mobile use – that manifests itself as a usability issue.

The results emphasise the importance of the follow up interview in elucidating relevant information where diary studies are used. However, the unexpected finding that usability is of greater influence than trust or confidence where mobile devices are used to access Internet based applications suggests a number of areas for further research. Furthermore, 'even though distractions are ever-present in everyday use of mobile devices, the nature and extent to which user perceptions and performance are affected by their presence is unknown' (Coursaris et al 2012). More detailed exploration of the relationship between confidence, usability and distractions may inform the design of future interfaces, as well as enabling deeper understanding of human interactions with mobile device usage for Internet applications.

References

Adams, B. D. (2005). Trust vs . Confidence, *HumanSystems Incorporated: Research Paper,* on Behalf of Canadian Department of National Defence, Toronto, Canada

Alaszewski, A., (2006), 'Using *Diaries for Social Research',* Introducing Qualitative Methods Series, Sage Publications, London, UK

Blanchard, A. L., Welbourne, J. L., & Boughton, M. D. (2011). A Model of Online Trust. *Information, Communication & Society, 14(1),* 76-106.

Bock, G-W., (et al), Lee, J., Kuan, H-H., and Kim, J-H., (2012), 'The Progression of Online Trust in the Multi-Channel Retailer Context and the Role of Product Certainty, *Decision Support Systems,* Volume 53

Brodkin, J., (2008), Mobile Phones to be primary Internet Device by 2020, experts predict. Retrieved 17th December 2008, from: https://www.networkedworld.com/news/2008/121508-pew-report.html

Chiu, C.-M., (et al) Hsu, M.-H., Lai, H., & Chang, C.-M. (2012). Re-examining the Influence of Trust on Online Repeat Purchase Intention: The Moderating Role of Habit and its Antecedents. *Decision Support Systems.* Elsevier B.V.

Cofta, P. (2007). Confidence, Trust and Identity. *BT Technology Journal, 25(2),* 173-178

Coursaris, C, K., (et al), Hassenein, K., Head, M, M., & Bontis, N., (2012), 'The Impact of Distractions on the Usability and Intentions to Use Mobile Devices of Wireless Data Services', *Computers in Human Behaviour,* Volume 28

Fukuyama, F., (1995), 'Trust: *The Social Virtues & the Creation of Prosperity',* The Free Press, New York, US

Gambetta, D. (1988) 'Trust: *Making and Breaking Cooperative Relations',* B. Blackwell, New York.

Grönlund, K., & Setälä, M. (2011). In Honest Officials We Trust: Institutional Confidence in Europe. *The American Review of Public Information, 43(3).*

Hamilton, D. L., & Sherman, S. J. (1996). Perceiving Persons and Groups. *Psychological review, 103(2),* 336-55.

Hardin, R., (eds.), (2004), *Distrust: Russell Sage Foundation Series on Trust*', Russell Sage Foundation, New York, US

Holton, G. (2004). Defining Risk. *Financial Analysis, 60(6),* 19-26. Retrieved from http://www.springerlink.com/index/WN40M1W373K5T04G.pdf

Hussain, A., (2012), 'Metric Based Evaluation of Mobile Devices: Mobile Goal Question Metric (mGQM)', Ph.D Thesis, University of Salford, UK

Hussain, A., and Kutar, M.,. "Apps vs Devices: Can the Usability of Mobile Apps be Decoupled from the Device?." *IJCSI International Journal of Computer Science* 9 (2012): 3.

Jones, M., (1999), 'Improving Web Interaction on Small Displays', *Proceedings of the 11th International Conferences on Human-Computer Interaction with Mobile Devices and Services*

Kakihara, M, S, C., (2002), 'Mobility: An Extended Perspective', *Proceedings of the 35th Hawaii International Conference on Systems Science (HICSS-35),* Hawaii, US

Lee, K, C., Chung, N., & Lee, S., (2012), Exploring the Influence of Personal Schema on Trust Transfer and Switching Costs in Brick-and-Click Bookstores', *Information & Management,* Volume 48

Luhmann, N. (1979) 'Trust *and Power: Two Works',* Wiley, Chichester, New York.

Luhmann, N. (2000). Familiarity, Confidence, Trust: Problems and Alternatives. *Trust: Making and breaking cooperative relations*

Misztal, B, A., (1996), 'Trust *in Modern Societies: The Search for the Bases of Social Order',* Polity Press, Cambridge, UK

Moorman, C., Deshpande, R., & Zaltman, G. (1993). Factors Affecting Trust in Market Research Relationships. *The Journal of Marketing, 57,* 81-101.

Nezlek, J, B., (2012), '*Diary Methods for Social and Personal Psychology*\, Sage Publications. London, UK

Perrucci, G, P., (et al), Fitzek, F, H, P., Sasso, G., Kellerer, W., and Widmer, J., (2009), 'On the Impact of 2G and 3G Network Usage for Mobile Phones' Battery Life', Proceedings of the *European Wireless Conference 2009*,

Pica, D., Sorensen, C., and Allen, D., (2004), 'On Mobility and Context: Exploring Mobile Police Work', *Proceedings of the 37th Hawaii International Conference on Systems Science (HICSS-37),* Hawaii, US

Siegrist, M., Gutscher, H., & Earle, T. (2005). Perception of Risk: The Influence of General Trust, and General Confidence. *Journal of Risk Research, 8(2),* 145-156.

Stone, D., (2012), 'Mobile – More than magic moment for marketers?', *Journal of Direct, Data and Digital Marketing Practice* **13**, 280-294 (April–June 2012)

Sztompka, P. (1999) 'Trust *: A Sociological Theory',* Cambridge University Press, Cambridge.

Ullmann-Margalit, E, M., (2004), 'Trust, Distrust and In-Between', in Hardin, R (eds.) (2004), 'Dis *trust: Russell Sage Foundation Series on Trust',* Russell Sage Foundation, New York, US

Uslander, E, M., (1999), 'Democracy *and Social Capital',* in Warren, M, E (eds), (1999), 'Democracy *& Trust',* Cambridge University Press, New York, US

Uslander, E. (2002). The Moral Foundations of Trust. *Trust in the Knowledge Society.*

Yevgen, B., (2007), 'Context Browsing with Mobiles – When Less is More', *Proceedings of the 5th International Conference on Mobile Systems, Applications and Services*

Zhang, D., and Adipat, B., (2005), 'Challenges, Methodologies, and Issues in the Usability Testing of Mobile Applications', *International Journal of Human-Computer Interaction,* 18(3), 293-308

Zimmerman, D., & Wieder, L. (1977). The Diary: Diary-Interview Method. *Urban Life, 5(4),*