

Spring 4-9-2014

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Recommended Citation

Makan, Jiten and Kutar, Maria, "Device Mediation And Online Behaviour" (2014). *UK Academy for Information Systems Conference Proceedings 2014*. 34.

<http://aisel.aisnet.org/ukais2014/34>

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DEVICE MEDIATION AND ONLINE BEHAVIOUR

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Abstract

From the research into trust, confidence and online behaviour, a number of themes emerged showing a difference in how participants use the web differently depending on the device being used to access it. A diary study-interview approach was used to gather the data, the results of which indicated that next-generation users (the heaviest of web users, and those more accustomed to Web 2.0 and mobile devices) restricted their range of online activities, particularly when using smartphones – their most frequently used device. The results of the interview pointed to the idea that usability remained a factor of paramount importance – not merely the capability and convenience. In addition, elements of the study eluded to the concept that the ‘mobile app’ coupled with smartphones have the potential capacity to provide a legitimate substitute to traditional modes of web access, i.e. desktop PC’s, laptops, tablets.

Keywords: next-generation user, smartphone, app

1.0 Introduction

‘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). An interesting aspect of this growth in web-enabled mobile devices is that the heaviest web users – referred to as next-generation users (NGUs) – operate from several different types of device on a regular basis, in opposition to simply using the device they’re most accustomed to.

The focus of this paper is to investigate how the web is accessed – i.e. through what type of device – and also whether the web is used in different ways based upon the device that is being used to access it. A study was conducted examining trust, confidence and web behaviour, which was intended to provide an insight into how participants used the web for social, domestic and pleasure purposes. The approach to research was the diary study-interview method. The choice behind this was formed

upon the idea that it enables an observational type study to be performed in its natural environment. A follow-up interview was included for each participant, the purpose of which was to providing further insight and add a 'richness' to the data. Results indicated six key themes, one of which is an interesting variance with regards to device use; this is investigated and reported in this paper.

We examine the ways in which users adapt their web behaviour depending on the device they use, and secondly, whether there are distinct drivers that act as an influence to facilitate this shift in behaviour.

The paper is structured so that the next section will present the background to the topic, and an analysis into trends surrounding web use and web-enabled mobile devices. The section after describes the research approach and presents the results arising from the diary study. The study identified differences in not only the choice of device by the same user, but also differences in their behaviour depending on the device being used at the time.

2.0 Background

This section provides the background to the research, initially discussing the problem of trust and confidence online, and then discussing shifts in the web, touching upon social networking and then shifts in mobile technology. The last element will be a brief outline of the various web user types according to the 2011 Oxford Internet Institute survey (Dutton & Blank 2011).

2.1 Trust on the Web

Trust is already seen to impact, influence and facilitate ecommerce (Lee & Turban 2001; Tang et al. 2012; Grabner-Kräuter & Kaluscha 2003). Other literature takes this notion further, explaining that trust is also an important factor in the adoption of e-government (Bélanger & Carter, 2008)) and e-health (Sillence, Briggs, Fishwick, & Harris, 2004) and virtual organisations (Arenas, Djordjevic, & Dimitrakos, 2005) but in the main, the central example typically rest on ecommerce (Corbitt, 2003; Corritore, Wiedenbeck, & Kracher, 2001; Xiao & Benbasat, 2003). Irrespective of the

context, there remains little to no common understanding of how trust is represented online. This is effectively where the nature of the problem becomes apparent.

Researching the works of philosophers, social theorists and social scientists shows that trust is not only an incredibly diverse, complex and often misdirected construct, but also there is no consensus on a definition (Taddeo, 2009). The problem occurs when literature makes the claim that trust affects online use, but does so without recognising or appreciating fully what trust is (Connolly, 2007). In many cases, a narrow aspect of trust is often taken and applied to the online context, but as deeper research shows, trust is a construct trust which contains an array of peculiarities that not only make it what it is, but stop it from being anything else.

The ‘peculiarities’ of trust were extracted from the wider research into the subject and, although overlapping in places, they are detailed below:

Requirement	Description
Risk	Risk has to be present within a trust situation, has to be significant enough to be considered and cannot be mitigated from (Siegrist et al. 2005; Gambetta 1990)
Vulnerability	‘Trust involves a judgement, however implicit, to accept vulnerability to the potential ill will of others by granting them the discretionary power over some good’ (Warren 1999). This means that the trustor leaves others an opportunity to harm one when one trusts, and also shows one’s confidence that they will not take it’ (Baier, 1986).
Uncertainty of outcome	‘We are acknowledging the other as a free agent, and this is part of the exhilaration both of trusting and being trusted. Where people are guaranteed safety, where they are protected from harm via assurances—if the other person acted under coercion, for example—trust is redundant; it is unnecessary. What we have is certainty, security, and safety—not trust’ (Nissenbaum, 2001). As Hardin writes, trust is ‘inherently subject to the risk that the other will abuse the power of discretion’.

No measures of protection	The evidence, the signs, the cues and clues that ground the formation, that give evidence of the reasonableness of trust must always fall short of certainty; trust is an attitude without guarantees, without a complete warranty (Luhmann 1990). It is as Adams (2005) phrases it, a ‘leap of faith’.
Breakdown of trust	When there is a breakdown of trust, the blame is attributed internally by the trustor, often in the form of regret, and this is why the understanding exists that once trust is broken it cannot be repaired. Damage incurred from a negative outcome is greater than the advantage being pursued (Deutsch 1962).
People	Throughout the literature, there is the understanding that trust requires reciprocity and ‘only persons, as social actors, are capable of following norms, including reciprocity, compliance with which is necessary for the reproduction of trust’ (Warren 1999). A vital aspect that is apparent from some of the literature is that the trustee (trusted person) must be able to become aware that she has been trusted, and develops a sense of obligation towards the trustor (Nissenbaum 2001; Warren 1999). Offe (1999) states explicitly, ‘only actors can be trusted, as they are the only units capable of reciprocating trust’.

There is a misalignment when applying these ‘peculiarities’ of trust to the Web context. As Nissenbaum (2001) identifies, satisfying particular aspects of trust within a particular situation, whilst disregarding others means that the construct in place cannot be trust in its legitimate form.

2.1 2.1 Web Shifts

The web has, and continues to shape society. In the most recent decade, a considerable part of the growth has been attributed to the development of a more interactive platform (Web 2.0) coupled with persistent developments with regards to the underlying technologies. The web has undergone and been subjected to numerous technical developments – from dial-up to broadband (Helsper, 2012), and WiFi (Lenstra et al 2011) to 4G (Correia 2006) – over the past twenty or so years, but its history can be categorised into two central shifts: Web 1.0 and Web 2.0 (Ryan 2010).

2.2 2.2 Web 2.0

Dale Dougherty coined the term “Web 2.0” in during a conference brainstorming session in 2004 (O’Reilly, 2007). Although inconsequential on the surface, the importance of this term are twofold, firstly the nod that it gives to the use of technical nerd-speak (Ryan 2010), but secondly, and more crucially it signaled the idea that the Web had entered a new phase. From being this ‘broadcast mechanism’ of Web 1.0, to the second phase, Web 2.0, the mechanism whereby the users could not only interact more seamlessly, but provide their own content more easily, more creatively, and more naturally than the technology could previously allow.

Users now became content providers – as well as users – which led to a Web environment that was constantly evolving and changing as people carved out their own parts of it, initially through forums and blogs, and later through then posting of images and video content to the biggest shift, social networking.

2.3 2.3 Social Networking

Whereas in the nineties electronic commerce was considered the “killer app”, the success of social networking in the most recent five years can go some way to imply that it has now shifted. In hindsight, it becomes almost obvious that social networking would prove to be subjected to phenomenal growth as it grew to capture the imagination of web users. ‘The mass adoption of social networking websites – the likes of instagram, twitter, facebook, youtube, tumblr, etc – points to an evolution in human social interaction’ (Weaver & Morrison, 2008). Humans are social beings and social networking supports this ‘human trait’ in a manner far superior than any previous technology (Valenzuela, Park, & Kee, 2009; Ryan 2010). So as well as providing a platform for adaptable, interactive, and engaging content through blogging, photo, video sharing etc (Boyd & Ellison, 2007) social networking also supports the basic, natural human characteristic of being ‘social’.

The Web went from – predominantly – providing efficiency benefits through to a way of conducting and managing the social lives of users, it essentially became personal.

2.4 2.4 Mobile Shift

A mobile device is understood to be moveable, portable and with an implied context of use that is personal as opposed to shared (Rosas et al 2003). ‘It wasn’t that long ago that the most exciting thing you could do with your new phone was to download a ringtone’ (Godwin-Jones, 2011), however ‘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: 2009). ‘Today, new iPhone or Android phone users face the quandary of which of the hundreds of thousands of apps (applications) they should choose. It seems that everyone from federal government agencies to your local bakery has an app available’ (Godwin-Jones 2011). This is why it becomes understandable that Brodtkin (2008) reports the expectation that the mobile phone will be the primary device used to access the Internet by 2020.

This continuous access and the social shifts to Web 2.0 functionality created a fertile environment to support the new shifts in use, culture and access. As opposed to the Web being access in structure periods, solid-blocks of time, it now became short bursts, interspersed through the day, conveniently and frequently. The Web became more accessible through the technological changes and more ‘interesting’ through the new services and innovations that Web 2.0 delivered. This changed the attitude of many users towards the role that the Web played within their lives.

2.5 2.5 Mobile Challenges

There is a curious paradox with mobile devices in that, despite their unrivalled technological capability, they present a unique set of challenges for interface designers; low-resolution screens, limited screen-size, limited input options, slow processing and limited connectivity (Zhang & Adipat: 2005). In addition limitations to CPU, memory and strict energy requirements that place a huge demand on battery life (Balan & Gergle, 2007) are further factors to consider.

Usability is a crucial concern for interface designs, and particularly so with mobile devices, as applications that are difficult to use require increased cognitive efforts from the user, increasing user error, increasing the time to complete a task, frustration and disappointment (Hussain and Kutar: 2012). A study by Jones et al., (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.

The problem exists that many 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). Apple in recognised this, and so ‘Web pages on the iPhone, by contrast, are not dumbed down in any way, but are displayed as they would appear in a normal web browser on a desktop computer (Godwin-Jones 2011). Many of the other hardware limitations of mobile devices were met incrementally as development pushed on.

Once the development platforms were established, the popularity of ‘mobile apps’ appears to have never waived. It can be suggested that perhaps mobile apps have enhanced the web experience beyond what a typical desktop browser can provide. The author perceives that in many cases, ‘mobile apps’ improve the user experience through the provision of a much neater, cleaner and more simplified approach to web interaction, particularly with activities such as online banking or social networking.

The launch and immediate success of tablet computers – specifically the Apple iPad – shows how, not only that users were shifting toward more portable and convenient modes of accessing the web, but how manufactures and interface designers had

‘overcome’ the many of the limitations of web-enabled mobile devices by producing a device that provides a more natural experience, closely mated to a regular desktop browsers.

The unrivalled portability and convenience paralleled to robust connectivity – in the form of WiFi, 3G and more recently 4G – gives a more complete, natural and usable means of interaction. Interestingly, the popularity of web-enabled mobile devices have been fuelled not merely by their professed ‘efficiency’ benefits alone, but through the development and availability of ‘mobile apps’.

The web experience through mobile app’s are designed for mobile devices, with functionality and interaction streamlined and simplified to accommodate how such devices are used, and – more crucially – the environments they’re used within i.e. slow connectivity, highly frequent, short bursts of use, distracting situations.

2.6 2.6 User Types

The Oxford Internet Institute Survey of 2011 presents the idea that there are two types of user – first generation user (FGU) and next generation user (NGU) – which, appear in some way at least to align to this notion of how the web shifted from Web 1.0 and Web 2.0. Although the characteristics of first-generation users (FGU) and next-generation users (NGU) are quite varied, a tangible connection can be made with the recent shift toward user driven content. Their study explains that the NGU’s are those who “grew-up” with Web 2.0 as the “norm”; this has led to these users having different attitudes on how they use the web, but, more crucially, how they access it. FGUs, on the other hand, are more accustomed to Web 1.0 functionality, and in addition to this, the web often plays a lesser a role within the daily life of an FGU, whereas NGU’s carry the notion that the web is critical to their lives.

The survey distinguishes between the types of user, based not so much on age, but more so on the type and number of devices that are used to access the web. The devices that the NGU uses to access the Web is one difference (i.e. more than access the web via mobile device, such as a smartphone, tablet or e-reader), but the main difference can be seen in what they use the Web for. The NGUs primary use of the

Web is for entertainment, information searching and generating their own content. Unlike FGU's, NGU's use the web as the first point of call for information searches and their entertainment and leisure pursuits are predominantly conducted online.

What can be taken from the above is that the shift toward Web 2.0 functionality and user driven content, technological advances in mobile networks and devices combined at the right time to lead to this next-generation user.

3.0 Diary Study – Interview Method

The motivation behind the study was to gain an understanding of how users – both FGU and NGU's – used the web, and more crucially whether the aspect of trust or confidence influenced their use. With the ethical challenges inherent within such a study, especially due to the desire to gather observational data, the approach chosen was the diary study-interview method of Zimmerman and Weider (1977).

There is the understanding that a carefully designed diary and equally supportive follow-up interview enables an observational approach to be adopted with the emphasis on minimising the level and/or perception of intrusiveness (Alaszewski 2006). Further advantages over a more typical, direct observational techniques can be found with regards to the relative ease of implementation; issues with geography, richness of data are all potential benefits that can be gained from diary study-interview method (Palen & Salzman 2002). Through the research into this approach, it became noticeable that the medical field, specifically healthcare, psychology and sexual relations, are the typical arena for where this research technique is applied. The rationale given, is that this approach allows for deeply private and sensitive data to be gathered in a manner that isn't perceived intrusive by the diarist, therefore increasing the element of observation and reducing the potential for researcher bias (Alaszewski 2006; Corti 1993; Zimmerman & Weider 1977).

The research process adhered to the following path:

- (i) Short initial interview – to explain the study to potential participants, establish whether they were suitable and an opportunity for them to ask questions.

- (ii) Diary study followed by – performed over seven consecutive days in their natural environment to reflect their typical web use for social, domestic and pleasure purposes only.
- (iii) In-depth follow-up interview – semi-structured format using a core set of questions and additional queries based around their specific diary.

A crucial role of the diary study is to facilitate the recording of the participants Internet activities, as or shortly after they have been performed. The need exists to create a diary which both captures the users web activity in a manner that doesn't hinder the participants' normal course of action. It is understood that highly detailed diaries not only affect completion rates and the users motivation (Alaszewski: 2006), but more importantly the validity of the data itself can be questioned if the diary requirements cause the participant to behave in a radically different way. The observational aspect of the diary study process must be acknowledged throughout, and the author believes firmly that the design of the diary must complement this requirement. The diary was presented in a largely free-text format with two guiding questions and a small amount of prescriptive information. The purpose of this was to allow the participant to approach the completion by whichever means they felt appropriate, as opposed to using a prescriptive tick-box method. This also allows for non-intrusive completion and freedom for serendipitous discovery (Coxon 1994; Zimmerman & Weider 1977).

3.1 3.1 Diary Study

Eighteen participants, a mixture of FGU and NGU's were asked to complete the diary over seven consecutive days, with the goal of recording their social, domestic and pleasure uses of the web. In order to ensure that their web behaviour remained as natural as possible, the requirement was set to only detail social, domestic and pleasure use of the web. This decision was made as work or study based use of the web may be the driven by requirements outside of the participants natural path, therefore is likely to provide little to no insight in nature of their web activity.

The follow-up interview reduced the onus placed upon the diary, as a more casual and open approach could be adopted, as the interview can be used a means of uncovering the richness or context of data that the diary points toward. Having an onerous, highly

detailed diary does have the advantage of providing useful data, however if the amount of effort to complete the diary is considered intensive, it will undoubtedly have an obtrusive impact upon the participants typical behaviour.

3.2 3.2 Follow-Up Interview

There were three phases to the interview questions, all designed to ‘pull out’ the detail that the diary pointed toward, but wasn’t expected to uncover.

- The initial phase of questioning was the centred on the ‘use’ of the Web; what they did on the Web, devices that they used, the points of the day they accessed it.
- The second set were focussed upon ‘shedding light’ upon on the construct that supports their Web use – is it driven by elements of confidence or trust. Uncovering their Web activity, coupled with their attitudes toward the Web has the potential to identify whether their use is more closely aligns to one that is driven by confidence, or one driven on trust.
- The third set of questions was formed from the analysis of the participants’ specific diary. This was the most ‘open ended’ element of the interview and was designed to flow freely and to be open for serendipitous discovery.

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).

Throughout the interviews, the questioning was made as open as possible to invite as much detail, ‘richness’ and emotion as possible. The focus was to effectively extract the ‘why’ as well as the ‘what’ and ‘how’ of Web use. Allowing participants to freely verbalise on details of their typical Web activities – not just on what was detailed within the diary – proved to be incredibly rewarding. This mechanism enabled the researcher to find out interesting aspects such as:

- I always have low expectations of the e-commerce...if its not different than what’s on the screen, then its faulty and needs returning
- I only use my phone for facebook...I can’t be bothered with all the messing about when you try to do anything else
- In the mornings, I read facebook like a newspaper

- I buy online because its easier than going to the shops
- When you get the emails asking for your bank details, you can just tell it's a scam, I just ignore them
- I'll only buy online if it's the last resort and I can't get it from the shops
- The main problems I get with going online are because of my attitude towards porn
- Well, when I'm downloading torrents, they're a risk because I don't know what will happen to my laptop, but I don't care because its free

4.0 Data Analysis and Emerging Themes

Using techniques from the works of Denscombe (2010), Oates (2007), Saldaña (2009) the approach was taken to hand-code the diary and interview data. It was this latter interview data that provided the most amount of insight (as expected). Once transcribed, the interview data was formatted according to the work of Liamputtong & Ezzy (2005), allowing space for a minimum of the first and secondary coding process. The diary data provided a loose impression of participants Web use in the form of highlighting the how, what, when and where, but the interview data provided more insight and context by detailing the reasons behind much of this.

Codes lead to categories, which were then re-analysed against the data to 'cross-check' their validity. These were refined further, overlaps removed and then themes and concepts began to emerge. There are seven themes that emerged, which aligns to the work presented by Lichtman (2006) and Creswell (2007) who explain that, once organised, most qualitative research studies synthesize into five to seven major themes

Theme	Description
User Types	the analysis showed that some pattern could be found with regards to web use and attitude. For instance, how use was mediated depending on the device, or how some users interspersed their web use throughout the day for short periods, whereas others only accessed it in a solid block of time from one location and only ever using one device

Preference for Usability	The interview data showed that usability appears (in many cases) to be the central factor influencing how the Web is accessed and for what activities. Its not simply about ‘trusting’ the device, it is the capability of the device and ease of use that appears most crucial
Experience and Online Optimism	The theme to emerge from the research is the understanding that users carry a logical balance rather than deep scepticism or blind optimism that governs their use, whereby unknown elements are more automatically assessed in terms of plausibility and reputation, which in turn, is built on experience.
Pessimism and Negative Expectations	Pessimistic users heighten the perceived likelihood of a negative impact, and furthermore increase the perceived impact caused by a risk event occurring, rather than assessing the nature, likelihood and impact of the risk, the decision is taken to withdraw completely
Confidence / Assurances	Confidence through assurances is what fuels ecommerce and much of online interaction in general. It isn’t trust.
Anxieties / Concerns	There are aspects of the web (particularly in relation) that raises concerns for the participant, sometimes enough to make them avoid the transaction / exchange
Conscious Trade-Offs	These refer to the deliberate and conscious web use whereby the risks involved are known, highly prevalent and lacking in protection. Such interactions require the user to consciously accept the risks and place themselves into a position of vulnerability.

The focus of this paper is the second theme to emerge, which showed that it wasn’t trust / confidence alone that led to use of particular activities, it was trust / confidence and the aspect of usability that determined the way people accessed it. For NGU’s mobile apps were used above all other alternatives, otherwise the most comfortable and supportive method – i.e. full website accessed via traditional device – was selected as it provided a greater sense of control and ease of use.

Matching both trust / confidence and usability (i.e. such as via mobile apps) appeared within the study to be the key driver supporting a greater shift to mobile technologies. It can be taken that it is not merely the capability of the device, but the proficiency in how it supports the tasks and the needs of the user – especially in this growing band of NGUs and their trait of short, frequent bursts of Web access interspersed throughout the day.

5.0 Research Findings

This section will be discussing the elements of the study that concern the interests of this specific paper. Overall, there were two elements that emerged from the study, one of which aligned to the Oxford Internet Institute Study of 2011 and their perception of user types, secondly was how web activity varied between the various types of devices available to the participant.

Each of the of the eighteen participants (A to R) used within the study, were daily web users, and taking the Oxford Internet Institute Survey 2011 into consideration, five can be seen as FGUs and the remaining thirteen as NGUs. Although FGUs had web-enabled mobile devices, they were seldom used for accessing the web, if at all. The remaining thirteen participants – considered NGUs – had predominantly used web-enabled mobile devices for accessing the web. However, one of the most interesting elements of the study emerged from the interviews which showed that the vast majority of the NGUs – 9 of the 13 – altered their web behaviour depending on the device that was being used at the time.

4.1 FGUs (Participants A to E)

Five participants (A to E) were considered to be FGUs based upon the nature of their web use and their web access. Four of these participants (A to D) stated that they never access the web through a mobile device on the basis that they have no requirement to do so. The manner by which they used the web didn't warrant access on a constant or always available basis. The fifth – participant E – cited usability issues as the core reason as to why they fail to access the web through a mobile device, they found the experience 'too annoying' and so conducted all their web activity through desktop PCs or laptops.

It was not merely the lack of mobile access to the web that identified participants A to E as FGUs, it was equally clear that their overall web behaviour further supported this idea. These users each had clear points of the day and established routines on how and when they accessed the web, in addition to a structure to the tasks they performed. These users were predominantly engaged in Web 1.0 activities – these broadcast elements such as ecommerce, email, news websites, information searching – with minimal Web 2.0 activities such as social networking, video sharing, or creating blogs. By the majority, these five participants tended to access the web through traditional devices such as desktop PC's or laptops and typically in a rigid timeframe based around their daily routine, e.g. before work, after work or during set break periods.

The understanding of the FGU is (according to the Oxford Internet Institute Survey 2011):

- Saw the Internet emerge from the mid-late nineties
- Familiar with the Internet as a broadcast entity, one where information is sent to them, as opposed to being an entity that accepts their (and other users) information
- Have fewer devices and fewer means of accessing the WWW and as a result they are not accustomed to, or in some cases, even aware of the more modern capabilities of Web 2.0

And from this, the study largely aligns its findings to this almost entirely. There is the curious element is that not all of the FGUs are of the eldest age group used within the study. Two participants C and D should, theoretically be more accustomed to Web 2.0 activities based upon their age groups, yet their web use remains structured, minimal and fails to incorporate mobile devices.

4.2 NGU's (Participants F to R)

The thirteen participants (F to R) that are categorised as next-generation users (NGU's) shared a different set of web-based characteristics than those five deemed FGUs on the basis of accessibility, frequency of use and nature of use.

These participants (F to R) share many traits with one another, namely that they typically use multiple types of web-enabled device, and more importantly, the majority – 4 of the 9 – alter their web behaviour depending on the device being used. The diaries indicated the types of devices used during a daily period (laptop / desktop, smartphone, tablet, other), however it would not always be clear as to what activity the participant performed on which device. This information emerged from the follow-up interviews.

On the whole, the use of the web for these participants correlated with what would be expected when taking into consideration the Oxford Internet Institute Survey of 2011. As anticipated, NGU's were heavy users of the web, and interestingly the nature of use varied considerably when compared against FGU's. As opposed to having distinct periods of a day dedicated to web activity akin to FGU's and through desktop or laptop, NGU's web use was actively spread throughout the day, across all periods and predominantly in shallow short bursts through mobile devices. FGU's had more of a noticeable time gap dedicated to web activity, usually via a desktop or laptop.

It was difficult for the NGU's to provide an estimate for how much time or what periods of the day they spent the web. FGU's were able to provide distinct points of the day and a rough estimate of time spend on the web. Participant A (FGU) says "Erm, well it's literally from when I get back to when I go to sleep. So it's sort of five till erm, midnight err, give or take the odd hour for time with my son" whereas Participant L (NGU) responded with "an hour or so, really...er, mainly morning and then like before I go to bed and just in between bits like during the day".

The thirteen participants all had access to web-enabled smartphones as well as access to traditional devices such as desktop PC's or laptops. A subgroup can be separated from this as two participants (F and G) also had use of a tablet device. Each participant – some more so than others – used multiple devices to access the web on a daily basis, with use predominantly on smartphones and also shared with desktop PC's or laptops.

Upon completion, transcription, collation and analysis of the interviews, the data started to show some interesting insights that – in the author's opinion – are worthy of

further study. On a superficial level, the data shows that there is a discrepancy between the tasks users perform on traditional devices compared to that which they perform on a smartphone. This is in spite of the fact that the NGU's spent the majority of their time accessing the web through smartphones or tablet computers over and above desktop PC's or laptops.

Participant	Mobile Device (Smartphone / Tablet)				Traditional Device (Desktop PC / Laptop)			
	Online Banking		Electronic Commerce		Online Banking		Electronic Commerce	
	Y/ N	Comments	Y/ N	Comments	Y/ N	Comments	Y/ N	Comments
F	Y	Tablet User	Y		Y		Y	
G	N	Tablet User (no personal need for online banking)	Y	Purchases only via mobile apps on Smartphone	N	No personal need for online banking	Y	
H	Y	Heavy Smartphone (via mobile app only)	Y		Y		Y	
I	Y	Heavy Smartphone user (via mobile app only)	Y		Y		Y	
J	N	No personal need for online banking	N		N	No personal need for online banking	Y	
K	Y	Via mobile app	N		Y		Y	
L	Y	Via mobile app	N		Y		Y	
M	Y	Via mobile app	N		Y		Y	

N	N		N		Y		Y	
O	N		N		Y		Y	
P	N		N		Y		Y	
Q	N		N		Y		Y	
R	N		N		Y		Y	

4.2.1 Tablet NGU's (Participants F and G)

Participant F explained that they used the web in exactly the same way irrespective of what device was being used, whether it laptop, smartphone or tablet. "I do everything on all of them...if I was buying something, or social networking or whatever, I'd just use all three of them".

Participant G had largely comparable web traits as F except for two central key differences. Firstly, it was explained in the interview that she doesn't partake in online banking, as she doesn't "really have the need to use it". Secondly, and more tellingly, although she would make purchases via any device – smartphone, tablet, laptop – purchases via her smartphone would only be made via an app as 'its just easier, all your things are saved if you have an App and stuff...you're already logged in, you just have to put in your security details when you buy stuff...you don't have to go through the whole process as if you would go on a website"

4.2.2 Heavy Smartphone NGU's (Participants H and I)

These two participants differed from the other NGU's throughout the seven-day diary period, the smartphone was the only device they used to access the web. The follow-up interview uncovered that despite having other devices available – namely desktop PC / laptop – the smartphone was the means by which, practically all their web activity was handled.

Participant H – akin to the Oxford Internet Institute Study 2011, their activity was for the majority, social networking, through a mobile app via a smartphone. Her web activity was social networking, and was spread sporadically through the day, covering every time period, every day. An example that infers the level of social networking use is ‘in the mornings, I check my Facebook like a newspaper’. Online banking is performed via the mobile app and online purchases are made, provided that there is no offline alternative available.

Participant I – performs all web activities via her smartphone. Her use is less intensive than that of participant H in terms of time spent online and frequency of access. Throughout the seven-day diary period, the majority of use was various forms of information searching along with elements of social networking, with very little in terms of more in-depth activities such as commerce or online banking. Within the interview, the participant explained that the lack of online banking and online purchasing was due fundamentally to lifestyle as opposed to security concerns.

4.2.3 Smartphone NGU’s (Participants J to R)

This covers the remaining nine participants who, on the surface at least, share a number of interesting similarities. It is the traits of this group of participants that are of key interest to the author.

Participant J differs from the remaining eight participants within this group as she is not an online banking user as “I’ve just never had the need to do so”. However, taking the full group together – J to R – it emerges that each of these users perform particular tasks via traditional devices as if almost second nature, yet fail to carry the same attitude when using smartphones. This is despite the smartphone being the device this group of NGU’s use the most to access the web. Of these users, the tasks they perform via traditional devices are not reciprocated across to smartphones. They mediated behaviour depending on the device, taking a selective approach and so only accessing limited or insignificant content via a smartphone. For instance:

- Participant K – ‘its mainly news and that kind of thing I check on my mobile...Facebook’

- Participant L – ‘on the phone, it’s mainly Twitter and Facebook, and searches from my work, and I use my Mac for pretty much anything else like paying tax bills or eBay’.
- Participant M - ‘I use my laptop for the important stuff, only really use my phone for Facebook and even then its just newsfeeds’.

A similar approach of using smartphones for ‘insignificant information’ and other devices for everything else from shopping to banking was largely identical for the majority NGUs. Most participants carried the stance that this decision to alter behaviour was due to usability, in the form of various comments from, “too small” (participant L), “too awkward” (Participant K), and “too faffy” (Participant E). From the diary data alone, it can be logically construed that security concerns were the overriding factor that limited mobile web 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.

A detail that works some way into supporting this notion – usability over security – is that despite purchases being performed on traditional devices such as laptops and desktops, the same definitive result cannot be said with online banking. The authors initial perception was centred on the idea that if a participant were unwilling to make purchases via a smartphone, then the same approach would be expected of online banking. However, a significant proportion – 6 from 13 – NGUs used banking services via a smartphone, all of which did so via a specific mobile app (as opposed to using the full website version).

As implied previously, mobile apps have become successful in many ways not merely from the entertainment value they can provide, but in instances such as online banking services, it enables the challenges of the mobile device to be met in a manner that supports usability – arguably, in some cases, better than full website versions. In the case of online banking, the mobile apps are typically designed to meet the interaction and interface challenges of the devices, as well as support the users cognitive processing by limiting the functionality to only the most essential of elements. The

ability to overcome these limitations goes some way to explaining the increasing popularity of mobile apps.

Smartphones coupled with mobile apps comprehensively support this NGU trait of short, highly frequent, and shallow bursts of web activity. In addition, the launch of the tablet has – arguably – provided further support to NGUs in the form of enhanced portability, improved battery life and processing power in a device that gives the full browsing experience akin to traditional devices.

6.0 Conclusions

Through the study, the author views a handful of small insights that potentially lay themselves up for future research within the fields of usability, mobile devices and mobile apps.

The diary study showed there to be a variance between the tasks participants performed on a traditional device (desktop PC / laptop), compared to those activities performed on a mobile device. The initial assumption centred on the idea of confidence, implying that participants behaved and engaged in less “risky” activities via their mobile devices than they were prepared to via laptops or desktop PC’s. With regards to NGU’s, the mobile device carried the vast majority of their web usage, yet the majority of this usage remained relatively shallow, e.g. information searches, social networking.

It was the follow-up interviews that provided the context and enabled an understanding to be gained as to why the disparity remained. In the majority of cases, the reasons cited were centred simply usability, not confidence or this idea of having a heightened perception of risk.

The study implied that usability was of fundamental importance – greater than confidence with regards to its influence on use – yet this isn’t to say that confidence can be ignored. Its role within the web is of crucial importance as it represents three things:

- Decision based on positive expectation (Seligman 1997)

- Competence (Luhmann 1990)
- Predictability of outcomes (Miształ 1996)

These elements combined it what enable users – or in this case, participants – to engage with the web, to transact, to provide information, to use services. On the back of this is the need for usability; more so than ever with the challenges set down by smartphones. The study indicates through the brief look into online banking that the “mobile app” compliments the needs of the smartphone user in terms of accessibility, clarity, speed, functions, and overcomes the usability challenges determined by the device itself, such as screen size, processing speed, input options.

Through successfully satisfying the users needs and overcoming the device design challenges, it can be logical to think that it is the mobile app which is enabling the smartphone to become a legitimate substitute to the traditional devices – laptop and desktop. The enhanced portability and functionality of a smartphone coupled with comprehensively designed mobile apps makes it, in many cases, more of a valid substitute to both traditional and tablet computers.

Obviously, a much more intensive study into mobile device use and task driven mediation would be required to substantiate these findings, but it does appear, to the author at least, that there is a logical possibility that such trends are more than mere coincidence.

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