The Positive and Negative Implications of Emerging Mobile Technologies

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Abstract

This paper identifies the positive and negative implications for society of emerging mobile technologies such as mobile telephones, laptops, 3G and SMS. An online survey recruited a total of 106 participants. The results suggest that whilst emerging mobile technologies undoubtedly offer a plethora of benefits to individuals, organisations and society, there is a corresponding need to raise user awareness on the increasing privacy, security and potential negative consequences relating to the rapid embrace of such technologies.

Keywords: Mobile Technologies, Data Addiction, Privacy, Communications, Productivity

Introduction

Mobile devices can be loosely defined as portable devices that have in-built computing or Internet capability (Morley, 2008). The 1990s saw the dawn of a new age of mobility with a proliferation of mobile computing devices; the age of mobile computing was born (Cook & Das, 2005). A decade of research and development into hardware and software spawned a myriad of mobile technologies that laid the foundations of today's ubiquitous computing age (Weiser, 1991).

The emerging mobile technologies responsible for this age have caused such a shift in society that physical barriers to communication have been largely eliminated. Increased mobility has also made time and location barriers for work almost obsolete. The world is moving towards ubiquitous, seamless data connectivity that enables communication, access and sharing of information from anywhere, at any time, through the combined use of a multitude of mobile technologies (Bing & Lorenz, 2002). These technologies help individuals to fulfil commitments to work, friends and family. As a consequence, social relationships and the relationships between people and work are changing as we now find ourselves immersed in an 'always on' culture (Sorensen, Yoo, & IFIP, 2005).

Metcalfe's law states that the value or usefulness of networked systems grows exponentially as the number of users linearly increases (Morville, 2005). In light of the estimated global penetration as of mid 2009 at 60 %, totalling 4.1 billion mobile phone subscribers worldwide (Bhatti, 2009), the potential of mobile phones alone to impact on society is inevitably strong. Arminen (2007) highlights issues of increased accountability and social responsibility resulting from mobile technologies. Laursen (2005) supports this, identifying a developing mobile-etiquette that involves norms for the reciprocation of calls and messages, and to always be available. The ability to multitask irrespective of time and location boundaries can be deemed both a positive and negative consequence of emerging mobile technologies - furthering productivity as well as the pressures to maintain it in both work and social environments.

Mobile communication now "profoundly affects the tempo, structure, and process of daily life around the world" (Katz, 2008, p. 3). Cairncross (1997) suggested that eradication of distance as a communication cost may be the most significant force that will change society in the first half of this century. Due to the rapidly developing, dynamic nature of mobile technologies, it is an academic subject that justifies continuous reflection and research to identify emerging trends and global sociological impact.

Examining the implications for society in light of emerging mobile technologies is the primary aim of this study. Results are derived from a global questionnaire, designed to provide current insight into usage trends and society's perspective of emerging mobile technologies.

Methodology

Primary research was conducted through administration of an online survey with an aim to provide insight into society's perspective of emerging mobile technologies. 106 full responses were received, representing the sample size of the study. Survey respondent demographics were as shown in Figure 1.

Gender		Employment Status	
Male	59.43%	Employed	75.74%
Female	40.57%	Unemployed	24.53%

Education Level	
Secondary Education/High School	4.72%
College/6th Form	19.81%
Undergraduate Degree	54.72%
Postgraduate Degree (MA, MSc, Ph.D.)	20.75%

Age	
18-25	54.72%
26-35	16.04%
36-45	9.43%
46-55	14.15%
56+	5.66%

Figure 1- Demographic Makeup of Primary Research Respondents

Results

Social Capital and Communications

Overall, 63 % of respondents felt that their social life had improved through the use of mobile technologies. 71 % of respondents felt that mobile technologies have increased the amount they communicate with their friends. 23 % believed that mobile technologies have increased their number of friends, indicating that the majority of individuals felt that mobile technologies have not positively influenced the size of their friendship base. However, mobile technologies proved to strengthen existing social networks, with 55 % in agreement. To further the cohesive influence of mobile technologies, 38 % of respondents put forward that, through not embracing mobile technologies, individuals may actually be excluded from social network activity.

Mobile technologies seemingly hold greater strength in influencing society's formation and sustainment of intimate relationships as opposed to general friendships. Mobile technologies enabled 37 % of individuals to talk to people they would not otherwise have spoken to. 50 % agreed mobile technologies can result in the formation of intimate relationships that otherwise would not have occurred. 60 % also believed that mobile technologies increase their inter-family communication and 84 % agreed that mobile technologies facilitate parents contacting their children.

SMS was revealed to influence the above findings. 76 % of respondents agreed that SMS aids people to develop and sustain existing relationships. 59 % of respondents gained increased confidence to communicate with people through use of SMS. 20% of respondents had at some point formed an intimate relationship through SMS. SMS can however result in the misunderstanding of feelings, with 82 % in agreement. 62 % of individuals also felt that SMS hampered their ability to represent themselves in a positive manner. Despite this, 51 % of respondents stated that SMS is now their primary means of communication, surpassing traditional voice calling in popularity.

3G and 4G

57 % of respondents now have 3G capable mobile devices, 47 % of which are satisfied with the speeds. Only 10 % of those without 3G planned to upgrade soon.

Respondents were questioned on their willingness to upgrade their mobile devices to 4G when it becomes available. 7 % of respondents would be willing to pay extra and 54 % would be willing to upgrade if no extra costs were incurred.

Productivity

70 % of respondents embrace mobile technologies to fill idle time (for example, waiting for a train or bus). 45 % of respondents stated they achieved productivity benefits at work through their use of mobile technologies. Overall feelings were however that mobile technologies do not make them more productive at work; only 31 % agreed that their overall work productivity had actually increased.

Productivity benefits are seemingly being countered by interruptions in the workplace as a result of mobile technologies themselves; 59 % of respondents were in agreement. 53 % of respondents stated that mobile technologies actually stimulate unnecessary communication and disruptions in the workplace, lowering productivity. 37 % of individuals also believe mobile technologies result in more communication, less time spent reviewing messages and decisions being made hastily as a result.

39% of individuals now spend more time dealing with e-mail and SMS than they spend completing assigned workloads. Emphasis from managers on the importance of effective communication is now imperative to reduce information volumes and the associated problems of 'information overflow'; 72 % of survey respondents agreed.

Work-Life Balance

52% of respondents agreed that mobile technologies facilitate the organisation of their personal lives. A greater majority (74 %) also agreed that mobile technologies facilitate the organisation of their professional lives. The ability to receive work communications anywhere and anytime was found to intrude on 36 % of respondents' personal lives; explained partially by 45% of individuals that now find it acceptable for colleagues to contact them out of hours on their mobile device.

The negative implications of mobile technologies are furthered by the 37 % of individuals that stated that mobile technologies have actually eroded the division between their work and home life, with 46 % of individuals now feeling obliged to answer calls from colleagues outside of working hours. 22 % of respondents also stated that they had seen no further benefits to their work-life balance as a result of this erosion. 23 % of respondents also stated that mobile technologies have resulted in them working more hours, with only 12 % actually earning more as a result.

Mobile technologies allow the majority of individuals to spend more time with friends (46 % in agreement) and family (44 % in agreement). 38 % of respondents believed mobile technologies have strengthened their working relationships; however 28 % of individuals suffer felt isolated due to mobile working practices. 8% also believed that mobile working has reduced the amount of friends they have at work.

Despite the potential for mobile technologies to facilitate work-life balance, only 27 % reported overall work-life balance benefits, with 29 % reporting a definite degradation to work-life balance and the rest remaining indifferent.

'Always On' Culture

Results revealed 84 % of individuals' primary mobile communication technologies are always on; 82 % keep them by their side at all times. 62 % of individuals reply to SMS messages immediately and 46 % of individuals respond to emails immediately.

Results identified mobile-etiquette involving norms of reciprocation of calls and messages, and to be always available. 28 % of respondents felt that not replying to an email straight away may be interpreted as rudeness. 41 % of individuals felt that not replying to an SMS message straight away may be interpreted in the same way. As a result of these evolving norms, 81 % now check SMS messages as soon as they receive them; 58 % reply straight away. 30 % of respondents stated that if they did not reply to an SMS straight away, they were unlikely to reply at all.

Technology Usage and Data Addiction

One third of respondents get anxious if emails or mobile devices are left unchecked for a few hours. 54 % of individuals now check social network sites such as Facebook and MySpace throughout the day. 45 % of working individuals now check work emails and voice messages during lunch hours, after hours and at the weekends. 22 % even check work emails and voice messages whilst on holiday. 44 % of individuals would now find it very difficult to go without using mobile technologies for a day.

Personal Security

Mobile technologies now give users more confidence to go out alone; 40 % agreed, 33 % disagreed and 27 % remained indifferent. 48 % of individuals are no longer afraid of getting lost due to mobile technologies. 44 % of respondents now feel safer to be alone, with 94 % stating that mobile technologies are invaluable in emergencies.

Privacy and Security

Regarding privacy and mobile technologies, 33 % of respondents felt that mobile devices imposed on their privacy and personal space. When questioned, 74 % of respondents expressed a degree of concern over mobile phone providers keeping records of SMS and calls. Despite these concerns however, only 26 % of respondents had ever read the Privacy Statement that came with their mobile contract.

Findings indicated that 34 % of respondents now admit to storing personal and sensitive information on their mobile devices. Only 50 % of respondents' mobile devices were however protected with a password or PIN. Only 48 % of respondents had ever read the Privacy Statement of any social networking sites they had joined and used through mobile technologies. Reasons for not doing so included their excessive length (56 %) or that they had not seen it (20 %). 66 % of individuals questioned have work colleagues on their social networking page friends list. 36% of individuals questioned have people they have never met face-to-face on their social networking page friends list. 40 % of individuals questioned also have people they do not really know on their social networking page friends list. 83 % of participants stated they knew how to change their social networking site privacy settings, 75 % stated they had done so. However, 27 % of individuals expressed concern over certain family members checking social networking pages, 27 % of individuals expressed similar worries regarding current employers and 38 % also expressed similar worries about future employers checking their social page.

Health

Mobile phones health implications concerned 42 % of respondents. 77 % of respondents felt more research is required into mobile phone health risks and 58 % of respondents felt that mobile phone health warnings should be more publicised.

Discussion and Conclusions

The implications of the findings from the primary research are significant in indicating that mobile technologies positively impact society with regards to increased social capital and quality of social life. Friends and families benefit from the omnipresent connections that now link each individual through their personal mobile devices, strengthening existing relationships and building on new ones. Mobile technologies have been proven to enable individuals the confidence and ability to establish new relationships that would otherwise not have been possible, in some cases resulting in intimate partnerships.

Failing to embrace such technologies has however been found to cause social disadvantage. There is now the potential for individuals to be excluded from social networks and activities as a result of a lack of connectivity to their social network.

Mobile technologies are now overtaking traditional fixed line communication mechanisms, with SMS now being the primary means of society's communication and Wi-Fi now utilised in nearly every home. Whilst use of mobile services such as mobile commerce and mobile banking have yet to be embraced by the majority of society, the increasing usability of emerging mobile technologies including smart phones and PDAs may encourage use. However, as use increases so will the phenomenon of data addiction, a trait apparent in users of such technologies.

Emerging mobile technologies were proven to increase productivity through enabling users to effectively utilise time that was previously spent idle. With regards to working productivity, results highlighted the potential of emerging mobile technologies to increase it through allowing individuals to situate themselves at locations free of distractions and effectively work from anywhere, at any time. However, with only a small proportion of the population stating that their productivity had increased as a result of the use of emerging mobile technologies, productivity benefits are seemingly being countered through increased amounts of interruptions in the workplace as a result of mobile technologies themselves.

Issues of 'information overload' were also raised, leading to correspondence being ill-prioritised, causing breakdowns in communications. Organisations need to train employees on correspondence efficiency to help resolve these issues.

Mobile technologies were found to facilitate individuals in the management of both professional and personal lives. These benefits come as a result of the ability to receive work communications anywhere and anytime, as well as the organisational facilities of mobile devices such as mobile calendars and reminders. Mobile technologies were also proven to strengthen working relationships between mobile working individuals, however, not for everyone. Some individuals are now being left feeling isolated through lack of face-to-face communication.

The consequential blending of home and working lives experienced by some individuals outweighed the benefits they received. Mobile technologies were found to be intrusive on personal lives, with some individuals now working longer hours for no remuneration. Obligation to respond to incoming communications is now causing increased intrusion and disruption of home and family lives, leaving almost half of working individuals with no choice but to discuss work outside of working hours. As mobile working increases as a tool to facilitate both the organisational productivity and work-life balance of employees, management practices require review and adaptation to ensure that both the needs of the company and employee are met. Both mobile working individuals and organisations must work together to ensure that true productivity and work-life balance benefits are achieved and not simply an increase in working hours, which in turn may reduce an individual's quality of life with no consequential benefit.

Research results revealed that the 'always on' culture is prevalent within society. Results identified a developing mobile-etiquette that involves norms of reciprocation of calls and messages, and to always be available, putting pressures on society to be 'always on'; keeping their mobile devices by their side at all times and checking them throughout the day. Individuals now check work emails and voice messages during lunch hours, after hours, at the weekends and whilst on holiday. Individuals are now expressing feelings of anxiety if they were not to check their email or mobile device every few hours, indicating a strong dependence on mobile devices and data. Such norms are inevitably

likely to escalate as social mobile etiquette continues to develop - further fuelling 'data addiction' and the 'always on' culture.

Social networking applications are spurring a whole new scale of concern over privacy. The use of these applications through mobile devices such as smart phones and PDAs entails a two-fold privacy concern. Social networking organisations need to realise their responsibility in ensuring users remain aware of their rights and how to adjust privacy settings. Both mobile device and social networking organisations also require a radical rethink of the mechanisms used to deliver privacy statements, including summarisation of key privacy issues for those that do not have the time or patience to digest long, complex materials. More emphasis also needs to be made on the implications of privacy statements, as well as their existence and location for those that have simply never seen them. Users of such technologies also need to remain vigilant in who they accept as 'friends' to ensure their private lives remain private and do not implicate their professional lives.

The future will bring a convergence of hi-speed Internet and mobile devices; it is then likely that a strict distinction between mobile technologies and fixed point devices will cease to exist. Usage patterns will be increasingly difficult to measure as they become less standardised and the current myriad of devices, potential uses and demographics of users evolve. This global development will continue to stretch demand for speed, usability and feature richness of mobile devices and services.

Wise (1997) asserts that society has developed the belief that political, moral and social problems are a result of a lack of communication and, if society improves communication, it will also solve some of the various problems that plague modern life. Future development of wireless infrastructures, services and devices will inevitably help to achieve global communication improvements, closing the digital divide, bridging social gaps between developed nations and those still developing with limited infrastructures and human rights. Use of mobile technologies however requires careful management and awareness of the potential threats that they impose to ensure that users' privacy, security and quality of life is not implicated.

Future work

'Information overload', 'data addiction', work-life balance, security and privacy concerns were the issues identified as most typically implicating society as a result of emerging mobile technologies, potentially threatening future progression of the mobile economy. Future research should seek to further identify the causes and consequences of these phenomena and identify potential mechanisms of resolution. This will help to ensure that mobile technology economy continues to prosper and users continue embrace the true benefits without disadvantaging themselves in terms of privacy, security, work-life balance and overall quality of life.

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