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ABSTRACT

While developments in technology have made computing and electronics ubiquitous and wearable, they have also given rise to a plethora of devices each delivering a special functionality. Numerous appliances and gadgets may overwhelm us, leading to ***Technology Overload***, the cognitive and physical burden placed on human beings due to usage of multiple devices for everyday activities. While research into the design of devices has concentrated on making each separate feature/ functionality of a device more efficient and effective, (such as enhancing the resolution of cameras or improving the portability of a mobile phone) or integrating a few functionalities at a time (such as PDA-phones, cell phone-cameras etc), little work has been done to systematically determine which features and functionalities should be placed in which device/s in order to reduce technology overload. This paper discusses technology overload and explores the implications of current and proposed solutions to help ease it.

Keywords

Technology Overload, Gadget overload, Information Overload, Convergence, ubiquitous computing.

INTRODUCTION

More than 50 years ago Vannevar Bush (1945), envisioned a machine that would help man collect, organize and pass on prodigious amounts of knowledge to future generations. He recognized the need for a machine to help humans handle information retrieval and loss. Today while much of Bush's vision has been realized, man is overwhelmed by the amount of information made available through technology. In an attempt to make information and communication available in various forms, vendors have created a plethora of devices and appliances, each meant to deliver a specific functionality catering to a specific task, and this has led to ***Technology Overload*** (defined below). Research into product usability has predominantly concentrated on making each separate feature/functionality of a device more efficient and effective (such as enhancing the resolution of cameras or improving the portability of a mobile phone). Very little research treats appropriate integration of the features and functions of multiple devices in order to reduce technology overload. This paper discusses: 1) existing issues and problems that lead to technology overload; 2) the current standing of technological solutions proposed; and finally 3) explores the implications and research questions raised by these solutions.

TECHNOLOGY OVERLOAD

With technology advancing and numerous devices and appliances finding their way to our homes, purses, briefcases, office desks and even our bodies, we face a situation of overload in more ways than one. We define ***Technology Overload*** as device proliferation and /or information overload that causes cognitive and physical burdens on human beings due to the use of multiple gadgets with multiple functions to accomplish multiple tasks in everyday activities. Technologists have acknowledged what psychologists have recognized for years – the limited capacity of humans to store and process information (Jones, Rafaeli and Ravid, 2004). However the tools and devices meant to ease the load on human cognition are not only inadequate but have actually added to overload. With increasing obligations and the need to keep up with information, multiple multitasking has become a way of life (Kirsh, 2001). Constant technologically mediated interruptions have become a regular occurrence, resulting in incomplete and inadequate actions that may be either deliberate (e.g. postponing a task) or unintentional (e.g. unable to cope). Either way this leads to a breakdown in human capability to retrieve and respond to information in an appropriate manner, which in turn may manifest as errors and frustration (Noyes and

Thomas, 1995). Thus while advances in technology have brought us to a higher level of information handling as compared to a few decades ago, they have also brought along distractions and obstacles that impede focused time on tasks at hand.

The next two sections discuss gadget overload and related information overload either of which can lead to technology overload. It should be noted that information overload and gadget overload can exist independent of each other and one can easily exist without the other. For example, we could suffer from information overload with one gadget and have gadget overload when the information is not overwhelming.

Information Overload

Information overload is defined as "the condition in which the amount of input to a system exceeds its processing capacity" (Speier and Price, 1998). Technology has enabled various devices such as computers, fax machines, phones, and televisions to push information towards us. We are swamped by emails, voice messages, phone calls, and auto pop-up windows on the Internet. A typical business manager is said to read one million words per week, which is equivalent to one and a half full novels per day (Winkle, 1998). Information is hitting us not just in asynchronous modes but in real time with live incoming chat requests, ringing phones etc.

In the context of computer mediated communication, researchers refer to both conversational overload – when too many messages are delivered, so that one cannot respond adequately - and information entropy - when incoming messages are not sufficiently organized to be recognized as significant or as part of conversation history (Hiltz and Turoff, 1985)

Factors leading to information overload are not limited to push technologies and their messages/ spam as discussed above but also include pull technologies. The Internet and worldwide web is looked on as a source of information on practically everything under the sun. Our desire to acquire more information is fueled further by devices that surround us and lure us to use them-- information is waiting to be grabbed and is just a click or tap away.

Gadget Overload

Apart from information overload, devices too contribute to technology overload in the form of a *gadget overload* defined as a condition where the number of devices exceeds the mental and physical handing capability of a user. Markets are swamped with new gadgets at an increasing rate-- nearly 160,000 U.S. patents were granted in 2000, a 75% increase in ten years (Hopkins, 2001) Personal communication devices include cellular phones, PDAs, laptop computers, personal computers, and most recently pocket PCs, tablet PCs and PDA/web cell phones. Anyone who has owned one or more such gadgets can relate to scenarios such as: 1) searching for the correct remote control for the TV or a Music system or a DVD player or a VCR; 2) batteries on cell phones dying mid- conversation; 3) wireless devices or cell phones being out of range; and 4) misplacing the cell phones or CDs etc. Too many gadgets/devices make it difficult to not only locate the right device but also to match the appropriate function of the device to the task at hand. One not only needs to keep physical track, but also to deal with maintenance in the form of bills, services and warrantees. New models, new versions and new combinations are constantly released, making devices obsolete and requiring updates.

Gadget overload also relates to the number of functions combined into a single device. Studies have shown that excessive functionality may result in misuse, errors and at times may become irrelevant to the user (Goodwin, 1987). In the zest to improve the functionality of a device and with electronics getting cheaper, gizmos such as cell phones that have calendars, address books and video-game players, cameras and Internet access have become common place. Providing excessive functionality is mistakenly seen as a solution to improved design; consumers have trouble figuring out these features and often are forced to have features that they do not want (Hopkins, 2001).

SOLUTIONS – EXISTING TECHNOLOGIES AND SUPPORTING INFRASTRUCTURE

While information overload is frequently treated as a separate entity from gadget overload, this paper concentrates on potential solutions for technology overload that include both gadget overload and related information overload. The proposed solutions follow four approaches: 1) convergence of many devices into a single device; 2) convergence of Networks; 3) standardization of user interfaces; and 4) context-aware computing. The sections below discuss these four approaches to reduce technology overload in terms of where we stand with existing technology.

Convergence to a single device

With a plethora of wireless portable communication devices, the hottest trend today is device convergence with ***Multi-Functional Devices (MFDs)*** that combine features of more than one device such as a camera, walkman, game machines,

remote control, e-wallet etc. (Thuresson, 2001). The mobile phone and the PDA have been the most used platforms for convergence. They are seen as extremely versatile multimedia tools that can enable users to do a wide range of activities such as sending e-mail, playing online games, and even listening to music. This approach of convergence to a single device reduces technology overload by reducing the number of devices one carries.

Convergence of networks

Typical home appliances include TVs, cameras, VCRs, DVDs, personal computers, telephones, answering machines and music systems. These devices currently run on at least four "independent networks," namely audio, data, telephony and TV (Bell and Gemmell, 2002). Some devices today are provided with increased connectivity through a single network offering diverse services. Such connectivity enables users to manage home appliances centrally from both inside and outside of their homes. Example products include Samsung's wireless home AV center (that allows high definition images as a home server and web surfing on TVs) and Tower Palace Cyber Apartments in Korea (where residents can remotely control products in their apartment) (www.samsung.com). This approach reduces the technology overload by allowing for centralized and unified control of devices and appliances.

Standardization of User Interface

Jakob Nielson (2001) stresses that "consistency is one of the most desirable attributes of user interfaces in software, websites and information appliances." Lack of consistency due to numerous interfaces within a pool of devices one uses adds to frustration, errors and learning problems. Often this consistency is maintained within a line of products produced by the same manufacturer/vendor. For example, all music systems of Sony (walkman, CD-player and boom box) have a consistent interface for operation.

Ubiquitous / Context-Aware Computing

Ubiquitous computing aims to reduce technology overload by "enhancing computer use by making computers available throughout the physical environment while making them effectively invisible to the user" (Weiser, 1993). Design of ubiquitous systems broadly adopts two approaches: 1) *embedded model*, where users interact directly with devices embedded in the real world environment; and 2) *portable model*, where users interact with portable devices such as the PDA and cell phones (Hilbert and Trevor, 2004). While portability enhances availability, the devices remain visible and aware. Ubiquitous computing can make our lives simpler by creating a seamless network of appliances and devices to help manage information efficiently and effortlessly. Context aware computing takes it a step forward by proactively delivering information from devices based on when and where users need it, thus reducing the 'information overload' component of technology overload (Schilit, Adams, and Want, 1994). Currently many proof of concept ubiquitous systems exist that make use of technologies such as augmented reality, intelligence and context-awareness that enable responsive devices, and seamless transportation of personal interface settings across devices and rooms (Andreoli, Castellani, Grasso, Meunier, Muehlenbrock, O'Neill, Ragnet, Roulland, and Snowdon, 2003; Mackay 1998; Hilbert and Trevor, 2003; Ho and Intille, 2005).

IMPLICATIONS AND RESEARCH QUESTIONS

Devising new technologies to reduce technology overload does not ensure that they actually work and are adopted by people. To overcome the many obstacles to use, it's important to understand the implications of these technologies. Social, legal, privacy and civil rights issues, and design implications of technology that is set up to reduce ***technology overload*** are discussed in the following sections.

Design Implications

Killer Application or an Application that kills?

Is the concept of a *single device* that "does it all" a utopian myth or a feasible solution? A consumer survey by Jupiter Research that asked people "how many devices they were willing to carry" revealed that they were just as likely to carry three devices as they were to carry one, and twice as likely to carry two (Gartenberg, 2002). It's important not to confuse what's possible with what's really useful. Consider these not so pleasant sides to a universal device: 1) *Upgrade or Replace* - When you want to get a better camera, do you have to throw away your PDA too? What happens if one feature fails, do we have to replace the entire device? 2) *All eggs in one basket* - What happens if we lose the device? Do we really want to place all eggs in one basket? 3) *Is Anytime anywhere really convenient all-the-time?* While the Swiss army knife is a handy portable tool to carry anytime anywhere, specialized kitchen knives are better for cutting food. 4) *Legacy Systems* - information collected on audiotapes, vinyl records, black & white photographs in prints, floppy disks, etc. would ideally be able to be integrated and compatible with the new technologies.

Some *research questions* that can be raised include: *1) Do we need a single device or two/three essential devices that can perform all functions? 2) How many devices does one need to consolidate all essential functions? 3) What will be the basis of selecting the above mentioned 2-3 essential devices? 4) Which functions can be clubbed together?* Should clubbing be based on related functions or digital lifestyle? Can we develop a generic framework on what functions can be combined and what can't be combined; *5) How can functional conflicts be reduced in MFDs?* For example, "how does one listen to MP3 and talk on the phone at the same time?" (Branwyn 2003); *6) Is it possible for devices to sense the location and place*?-Can it be made context sensitive so that it knows it has to act as a phone and not as a camera?; and *7) How seamless is a media switch in a converged device?*

Lack of standardization and Inter-Operability

The biggest impediment in creating ubiquitous computing environments continues to be lack of standards that allow seamless integration and inter-operability among heterogeneous computing devices. While research labs and even a few commercial organizations have produced little pieces of pervasive technology, cannot interoperate. Organizations such as the National Institute of Standards and Technology (NIST) provide support to technologies that seek standardization. (Thibodeau, 2003)

Research Question: *How and what standards should be developed for seamless transition from one device to another in ubiquitous/mobile computing?*

Continuous vs. Occasional Connectivity

While having continuous connectivity seems intuitive in ubiquitous computing network environments, its feasibility is questionable when one is truly up and about. Most applications today are developed to work when connected to the network. Solutions may frequently reconnect using different hot spots and may later be connected via a wire at work/home. As a result when the connection is broken, applications stop working. But when applications are developed to make solutions that can continue work in the latest known state of unwired spaces they were in, they can facilitate work in a world that quickly becomes unconnected. Building applications for an "occasionally connected computing environment" which work in a manner similar to how email applications in offline mode, can overcome the problems with lack of continuous connectivity (Thomas, 2003).

Research Questions: Should continuous vs. occasional connectivity be provide as mutually excusive options? What are the impacts of each option related to nature of the task in the user's hand?

Conflicting Size

Many converged gadgets utilize plug-ins, which trim size. This potentially leads to going from "gadget-laden belts" to "gadget-bulging pockets" (Branwyn 2003). Convergence of PDA with phones poses a constraint on size. While one can dream of phones reduced to the size of an ear stud, the screen size of a PDA cannot be shrunk to a point that one can't see it! Where does the tradeoff end? Can PDA screens be augmented for the user via glasses while phones are embedded in the ear rims of the glasses? To achieve truly ubiquitous computing environments as envisioned by Mark Weiser (1993), technology has to recede into the background.

Research Question: What are the optimal tradeoff-points in designing for factors such as size, functionality and user comfort?

Embedded vs. Portable

While embedded systems are more "usable, available and simpler to implement than portable systems", portable systems provide "remote control and privacy" (Hilbert and Trevor 2004). The question of which approach works better should be replaced by which approach is more suitable for a specific context. Hilbert and Trevor (2004) suggest that "designers should consider incorporating personalization in already existing embedded surfaces – to the degree possible- rather than creating new portable interfaces, especially when shared devices support complex tasks." Further they suggest that with privacy and remote control advantages of portable approach, designers should consider "hybrid solutions that allow users to interact with portable interface for remote control and highly sensitive tasks."

Research Questions: Most MFD devices are simply various permutations and combinations of functionalities of more than one device. *Does having one portable device instead of two or three really reduce overload?* Many functions may be hardly used by the users, depending on their lifestyle. Is one man's load reduction another's load creation? While a young mom of an infant or baby may want to take photographs of every first thing that her baby does, a Wall Street executive may not find

uses for the camera that often *How do we approach convergence: 1) based on related functions; or 2) based on lifestyle* (Pfeiffer Report, 2001) ? Life styles of target groups and their usage patterns should be considered rather than putting out a mere marketing gimmick that is sure to please a technology geek. Finally, no matter how many combinations manufacturers come up with, users may adapt devices in their own way in a serendipitous fashion. *Can platforms be developed to make custom combinations with ease?*

Social Implications

Cultural/ lifestyle issues

Culture influences what kind of technology is embraced. In countries like Japan and Singapore, mobile phones have transformed how the consumers spend time on the train. Passengers once seen reading books, newspapers, and other printed material, are today seen pushing the buttons of their cell phones for communication and entertainment. This trend however is not universal and for example is not seen in USA, where most people travel by cars and using phones while driving can be dangerous and is against the law in certain states. Further if one needs to listen to music, the CD player in the car is already in place. In certain other countries like India, passengers using public transport often use the time to make small talk. Can a society so culturally compelled to talk with fellow passengers switch to using phones instead? Life styles and cultures play an important role in adoption of ubiquitous computing and portable technology.

Research Question: How does culture impact ubiquitous technology use?

Health Hazards

The health hazards of cell phones are currently being researched and some have been identified. We do not have enough data on possible long term health hazards.

Research Questions: What kind of hazards do converged devices bring? What implications do wearable computers have for physical and emotional health?

Over - Reliance on Technology

Technology is not infallible and failures are bound to occur. What are the implications of failure? Can you imagine the smart apartment annoyingly having lights coming on and music playing at weird times? What if you are locked out of your "smart" apartment, or worse, locked inside the apartment with all communications to outside world cut off?

Security threats and attacks are currently pressing issues. We need to be wary of such events and be prepared for possible ill effects of new technology. With centralized control of smart homes and offices, security becomes an issue. What if someone hacks into the system and turns your apartment into mini-pool by excessively watering the indoor plants?

Research Question: How can ubiquitous technology be designed to reduced human error and negligence, and deliberate hacking?

Privacy and Rights Implications

As we embrace ubiquitous computing that is embedded into our everyday activities, we are allowing for information such as: 1) who we are; 2) where we are at what time; 3) people we interact with; and 4) activities we undertake, to be captured. Historically this information was protected by the mere difficulty in capturing, accumulating and sorting of the data collected on numerous individuals. However with increased processing power and high speed networks with advanced intelligence and single identification numbers, this information can be acquired with little effort, leading to erosion of privacy. While some design solutions in the form of displays for situational privacy in mobile technology are being researched more work is warranted. (Grimes, Tarasewich and Campbell, 2005)

Research Question: What kind of design implications do privacy issues have? How should default systems be designed – inclined towards greater privacy or greater information access (Jacko and Sears, 2003)?

When organizations build ubiquitous computing environments for their employees, will they "simplify and enhance supervisory activity by steering it towards an evaluation of work output rather than behaviors and appearance," or raise privacy and rights issues on content and information that can be accessed and monitored (Jessup and Robey 2001)?

Research Question: How willing are people to embrace ubiquitous computing to reduce technology overload, at the cost of their privacy and civil rights?

There was a time when strict boundaries where created and exercised between work and non-work. Spatial boundaries demarcated home from office, temporal boundaries demarcated office hours such as the five day week or 40 hour week from private or leisure hours. With the advent of remote and wireless networks, these boundaries are fading. Many homes today are primary or secondary workplaces and work is done remotely anytime as long as workers can be in contact with relevant stakeholders such as employees and customers, and share data through computing networks. This leads to a serious situation where "working anytime, anywhere" may change to "work becoming *all the time, everywhere*." (Jessup and Robey 2001). This leads to the following research question:

What kind of boundaries need to be established to work in a ubiquitous environment? How willing are people to embrace ubiquitous computing to reduce technology overload at the cost of social and work boundaries?

Legal Implications

The above issues lead to questions about the evolving laws on how to deal with privacy and civil rights and ownership .Who has a right of ownership - the person who collects information or the person who is the subject of information? Convergence and integration services and ubiquitous computing demand a rethinking of federal regulations, especially in an era of global communications.

Different countries have different regulatory policies in treating converging technology. For example, while IPT is legal in the USA, it's illegal in Cambodia and has dual treatment in Bangladesh where accepting incoming IP calls is legal while making outgoing calls on IP is illegal. Developers must take into consideration various regulatory policies that govern technology both nationally and internationally and evaluate their implications for consumers (ECC Report 9, 2002).

CONCLUSION

"The best way to predict future is to invent it" said Alan Kay (1971), (Bell and Gemmell, 2002). However understanding the implications discussed above reminds us that the technology of ubiquitous computing and convergent devices as a solution to ***technology overload*** is still in its infancy as far as consumer acceptance and adoption is concerned. Tradeoffs seem unavoidable, utility is definitely questionable and their role in reduction of ***technology overload*** remains suspect. An optimal combination of the four approaches described for reducing technology overload in various contexts needs to be identified. Issues raised in this paper are just the beginning of what is needed to achieve technological dreams and avoid technological nightmares.

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REFERENCES

1. Andreoli, J.M., Castellani,C., Grasso, A., Meunier, J., C., Muehlenbrock, M., O'Neill, J., Ragnet, F., Roulland, F. and Snowdon, D. (2003) Augmenting Offices with Ubiquitous Sensing, *Proceedings of Smart Object Conference*, Grenoble, France.
2. Bell, G. and Gemmell, J. (2002) Call for the home media network, *Communications of the ACM*, 45, 7, 71-75.
3. Branwyn, G., (2003) Gadget covergence, *Digital LivingToda*, Online available at http://dlt.computers.excite.com/excite/yourdough/gadget_convergence/
4. Bush, V. (1945) As we may think, *The Atlantic Monthly*, 176, 1, 101-108.
5. ECC Report 9, (2002) Economic and regulatory aspects of IP telephony, *European Conference Of Postal and Telecommunications Administrations (CEPT)*, Paris. Online available at http://www.ero.dk/documentation/docs/doc98/official/pdf/ECCREP009.PDF
6. Gartenberg, M. (2002) Conversation trumps convergence, *COMPUTERWORLD*, August 26 2002. Online available at http://www.computerworld.com/mobiletopics/mobile/story/0,10801,73724,00.html

7. Goodwin N. (1987) Functionality & Usability, *Communications of The ACM*, 28, 3, 229-233.
8. Grimes, A., Tarasewich, P. and Campbell, C. (2005) Keeping information private in the mobile environment, *Position paper CHI 2005 Workshop on Social Implications of Ubiquitous Computing*.
9. Hilbert, M., D. and Trevor, J. (2004) Personalizing shared ubiquitous devices, *Interactions*, 11, 3, 34-43.
10. Hiltz, S., R. and Turoff, M., (1985) Structuring computer-mediated communication systems to avoid information overload, *Communications of the ACM*, 28, 7, 680-689.
11. Ho, J. and Intille, S., S. (2005) Using context-aware computing to reduce the perceived burden of interruptions from mobile devices, in Shumin Zhai and Wendy Kellogg (chairs) *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI 05)*, Portland, Oregon, ACM Press, 909-918.
12. Hopkins, J. (2001) When designers ignore consumers, products can flop, *USA Today*, December 31. Online available at http://www.usatoday.com/tech/products/front.htm
13. Jacko, A., J. and Sears, A. (2003) The human-computer interaction handbook - fundamentals, evolving technologies and emerging applications, Lawrence Erlbaum Associates Inc.
14. Jessup, L., M. and Robey, D. (2001) The relevance of social issues in ubiquitous computing environments, *Communications of the ACM*, 45, 12 , 88-91.
15. Jones, Q., Rafaeli, S. and Ravid, G. (2004) Information overload and the message dynamics of online interaction spaces: A theoretical model and empirical exploration, *Information Systems Research* , 15, 2, 194-210.
16. Kirsh, D. (200/1) A few thoughts on cognitive overload, *Intellectica*, 30, 19-51.
17. Mackay, E., W. (1998) Augmented reality: Linking real and virtual worlds: A new paradigm for interacting with computers, in Tiziana Catarci, Maria Francesca Costabile, Giuseppe Santucci and Laura Taranfino (Eds.) *Proceedings of the Working Conference on Advanced Visual Interfaces*, L'Aquila, Italy, New York: ACM Press, 13-21.
18. Nelson, J. (2002) Coordinating user interfaces for consistency, Morgan Kaufmann Publishers, San Francisco.
19. Noyes, J. M., Thomas, P.J. (1995) Information overload: An overview, *IEE Colloquium IEE Colloquium* (Digest) 223, 1-3.
20. Pfeiffer report, (2001) Convergence with a twist, Online available at http://www.pfeifferreport.com/trends/ett_devconvergence.html
21. Schilit, B., Adams, N. and Want, R. (1994) Context-aware computing applications, *1st International Workshop on Mobile Computing Systems and Applications*, 85-90.
22. Speier C. and Price, M.F. (1998) Using aggregated data under time pressure: A mechanism for coping with information overload, *Thirty-First Annual Hawaii International Conference on System Sciences*, 2, 4 -13.
23. Thibodeau, P. (2003) Pervasive computing gets organized, *COMPUTERWORLD*, January. Online available at http://www.computerworld.com/hardwaretopics/hardware/story/0,10801,77369,00.html
24. Thomas, C. (2003) Anytime, anywhere: The new standard, *Mobile Imperative*, 1, Montgomery Research Inc. Online available at http://www.mobileimperative.com/documents.asp?d_ID=1811
25. Thuresson, M. (2001) Convergence emergence, *Japan.Inc*. Online avaible at http://www.japaninc.net/mag/comp/2001/05/may01_converge.html
26. Weiser, M. (1993) Some computer science issues in ubiquitous computing, *Special Issue on Computer Augmented Environments: Back To The Real World*, ACM Press, 36, 7, 75 - 84.
27. Winkle, V.W (1998) Information overload - fighting data asphyxiation is difficult but possible, *Computer Bits*, 8, 2, February. Online available http://www.gdrc.org/icts/i-overload/infoload.html