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iTunes Is Pretty (Useless) When You're Blind: Digital Design Is Triggering Disability When It Could Be a Solution

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Introduction

This year, 2008, marks the tenth anniversary of the portable MP3 player. MPMan F10, the first such device to utilise the MP3-encoding format, was launched in March 1998 (Smith). However it was not until April 2003 when Apple Inc launched the iPod that the market began the massive growth that has made the devices almost ubiquitous in everyday life. In 2006 iPods were rated as more popular than beer amongst college students in the United States, according to *Student Monitor.* Beer had only previously surpassed in popularity once before, in 1997, by the Internet (Zeff). This year will also see the launch in Australia of the latest offering in this line of products – the iPhone – which incorporates the popular MP3 player in an advanced mobile phone. The iPhone features a touch-sensitive flat screen that serves as the interface for its operating system. While the design is striking, it also generates accessibility problems. There are obvious implications for those with vision impairments when there are no physical markers to point towards the phone's functions (Crichton).

This article critically examines the promise of Internet-based digital technology to open up the world to people with disabilities, and the parallel danger that the social construction of disability in the digital environment will simply come to mirror pre-existing analogue discrimination. This paper explores how technologies and innovations designed to improve access by the disabled actually enhance access for all users. The first part of the paper focuses on 'Web 2.0' and digital access for people with disability, particularly those with vision impairment. The online software that drives the iPod and iPhone and exclusively delivers content to these devices is iTunes. While iTunes seems on the surface to provide enormous opportunity for the vision impaired to access a broad selection of audio content, its design actually works to inhibit access to the platform for this group. Apple promotes the use of iTunes in educational settings through the iTunes U channel, and this potentially

excludes those who have difficulty with access to the technology. Critically, it is these excluded people who, potentially, could benefit the most from the new technology. We consider the difficulty experienced by users of screen readers and braille tablets in relation to iTunes and highlight the potential problems for universities who seek to utilise iTunes U. In the second part of the paper we reframe disability accessibility as a principle of universal access and design and outline how changes made to assist users with disability can enhance the learning experience of all students using the Lectopia lecture recording and distribution system as an example. The third section of the paper situates these digital developments within the continuum of disability theory deploying Finkelstein's three stages of disability development. The focus then shifts to the potential of online virtual worlds such as Second Life to act as a place where the promise of technology to mediate for disability might be realised. Goggin and Newell suggest that the Internet will not be fully accessible until disability is considered a cultural identity in the same way that class, gender and sexuality are. This article argues that accessibility must be addressed through the context of design and shared open standards for digital platforms.

Web 2.0 and Accessibility

The World Wide Web based its successful development on a set of common standards that worked across different software and operating systems. This interoperability held out great opportunity for the implementation of enabling software for those with disability, particularly sight and hearing impairments. The increasing sophistication and diversification of online content has confounded this initial promise. Websites have become more complex, particularly with the rise of 'Web 2.0' and the associated trends in coding and website design. This has aggravated attempts to mediate this content for a disabled audience through software (Zajicek). As Wood notes, 'these days many computers are used principally to access the Internet – and there is no telling what a blind person will encounter there'.

As the content requiring translation – either from text into audio or onto a braille tablet, or from audio into text captions – become less standardised and more complex, it becomes both harder for software to act as a translator, and harder to navigate this media once translated. This is particularly the case when links are generated 'on the fly' for each view of a website and where images replace words as hyperlinks. These problems can trace their origin to before the development of the World Wide Web. Reihing, addressing another Apple product in 1987 notes:

> The Apple Macintosh is particularly hard to use because it depends heavily on graphics. Some word processors 'paint' pictures of letters on the screen instead of using standard computer codes, and speech or braille devices can't cope (in Goggin and Newell).

Web 2.0 sites loaded with Ajax and other forms of Java scripting present a particular challenge for translation software (Zajicek). iTunes, an iconic Web 2.0 application, is a further step away from easily translated content as proprietary software that while operating though the Internet, does not conform to Web standards. Many translation software packages are unable to read the iTunes software at all or are limited and only able to read part of the page, but not enough of it to use the program (Furendal). As websites utilising 'Web 2.0' technology increase in popularity they become less attractive to users who are visually impaired, particularly because the dynamic elements can not be accessed using screen readers provided with the operating system (Bigham, Prince and Ladner).

While at one level this presents an inability for a user with a disability to engage with the popular software, it also meant that universities seeking to use iTunes U to deliver content were excluding these students. To Apple's credit they have taken some of these access concerns on board with the recent release of both the Apple operating system and iTunes, to better enable Apple's own access software to translate the iTunes screen for blind users. However this also illustrates the problems with this type of software operating outside of nominated standards as there are still serious problems with access to iTunes on Microsoft's dominant Windows operating system (Furendal). While Widows provides its own integrated screen reading software, the company acknowledges that this is not sufficiently powerful for regular use by disabled users who will need to use more specialised programs (Wood). The recent upgrade of the standard Windows operating system from XP to Vista seems to have abandoned the previous stipulation that there was a keyboard shortcut for each operation the system performed – a key requirement for those unable to use a visual interface on the screen to 'point and click' with a mouse (Wood).

Other factors, such as the push towards iTunes U, explored in the next section, explain the importance of digital accessibility for everyone, not just the disabled as this technology becomes ubiquitous. The use of Lectopia in higher education demonstrates the value of flexibility of delivery to the whole student population, inclusive of the disabled.

iPods and Higher Education

iTunes is the enabling software supporting the iPod and iPhone. As well as commercial content, iTunes also acts

as a distribution medium for other content that is free to use. It allows individuals or organisations to record and publish audio and video files – podcasts and vodcasts – that can be automatically downloaded from the Internet and onto individual computers and iPods as they become available. Significantly this technology has provided opportunities for educational use. iTunes U has been developed by Apple to facilitate the delivery of content from universities through the service. While Apple has acknowledged that this is, in part, a deliberate effort to drive the uptake of iTunes (Udell), there are particular opportunities for the distribution of information through this channel afforded by the technology. Duke University in the United States was an early adopter, distributing iPods to each of its first-year students for educational use as early as 2004 (Dean). A recent study of students at The University of Western Australia (UWA) by Williams and Fardon found that students who listen to lectures through portable media players such as iPods (the 'Pod' in iPod stands for 'portable on demand') have a higher attendance rate at lectures than those who do not.

In 1998, the same year that the first portable MP3 player was being launched, the Lectopia (or iLecture) lecture recording and distribution system was introduced in Australia at UWA to enable students with disabilities better access to lecture materials. While there have been significant criticisms of this platform (Brabazon), the broad uptake and popularity of this technology, both at UWA and at many universities across Australia, demonstrates how changes made to assist disability can potentially help the broader community. This underpins the concept of 'universal design' where consideration given to people with disability also improves the lives of people without disability. A report by the Australian Human Rights and Equal Opportunity Commission, examined the accessibility of digital technology. Disability issues, such as access to digital content, were reframed as universal design issues:

> Disability accessibility issues are more accurately perceived in many cases as universal access issues, such that appropriate design for access by people with disabilities will improve accessibility and usability for … the community more generally.

The idea of universal access was integral to Tim Berners-Lee's original conception of the Web – however the platform has developed into a more complex and less ordered environment that can stray from agreed standards (Edwards, "Stop"). iTunes comes with its own accessibility issues. Furendal demonstrated that its design has added utility for some impairments notably dyslexia and colour blindness. However, as noted above, iTunes is highly problematic for those with other vision impairment particularly the blind. It is an example of the condition noted by Regan:

> There exists a false perception among designers that accessibility represents a restriction on creativity. There are few examples that exist in the world that can dissuade designers of this notion. While there are no technical reasons for this division between accessibility and design, the notion exists just the same.

The invisibility of this issue confirms that while an awareness of differing abilities can assist all users, this blinkered approach to diverse visual acuities is not only blocking social justice imperatives but future marketing opportunities. The iPhone is notable for problems associated with use by people with disabilities, particularly people with hearing (Keizer) and vision impairments (Crichton). In colder climates the fact that the screen would not be activated by a gloved hand has also been a problem, its design reflects bias against not just the physically impaired. Design decisions reflect the socially constructed nature of disability where disability is related to how humans have chosen to construct the world (Finkelstein ,"To Deny").

Disability Theory and Technology

Nora Groce conducted an anthropological study of Martha's Vineyard in the United States. During the nineteenth century the island had an unusually high incidence of deafness. In response to this everyone on the island was able to communicate in sign language, regardless of the hearing capability, as a standard mode of communication. As a result the impairment of deafness did not become a disability in relation to communication. Society on the island was constructed to be inclusive without regard to a person's hearing ability.

Finkelstein (*Attitudes*) identified three stages of disability 'creation' to suggest disability (as it is defined socially) can be eradicated through technology. He is confident that the third phase, which he argues has been occurring in conjunction with the information age, will offset many of the prejudicial attitudes established during the second phase that he characterised as the industrial era.

Digital technologies are often presented as a way to eradicate disability as it is socially constructed. Discussions around the Web and the benefits for people with disability usually centre on accessibility and social interaction. Digital documents on the Internet enable people with disability greater access than physical spaces, such as libraries, especially for the visually impaired who are able to make use of screen readers. There are more than 38 million blind people who utilise screen reading technology to access the Web (Bigham, Prince and Ladner). A visually impaired person is able to access digital texts whereas traditional, analogue, books remain inaccessible. The Web also allows people with disability to interact with others in a way that is not usually possible in general society. In a similar fashion to arguments that the Web is both gender and race neutral, people with

disability need not identify as disabled in online spaces and can instead be judged on their personality first. In this way disability is not always a factor in the social encounter.

These arguments however fail to address several factors integral to the social construction of disability. While the idea that a visually impaired person can access books electronically, in conjunction with a screen reader, sounds like a disability-free utopia, this is not always the case as 'digital' does not always mean 'accessible'. Often digital documents will be in an image format that cannot be read by the user's screen reader and will need to be converted and corrected by a sighted person. Sapey found that people with disabilities are excluded from informational occupations. Computer programming positions were fourth least likely of the 58 occupations examined to employ disabled people. As Rehing observed in 1987, it is a fantasy to think that accessibility for blind people simply means turning on a computer (Rehing in Goggin and Newell).

Although it may sound empowering for people with disability to interact in an environment where they can live out an identity different from the rhythm of their daily patterns, the reality serves to decrease the visibility of disability in society. Further, the Internet may not be accessible for people with disability as a social environment in the first place. AbilityNet's *State of the eNation Web Accessibility Report: Social Networking Sites* found a number of social networking sites including the popular MySpace and Facebook are inaccessible to users with a number of different disabilities, particularly those with a visual impairment such as blindness or a cognitive disability like dyslexia. This study noted the use of 'Captcha' – 'Completely Automated Public Turing test to tell Computers and Humans Apart' – technology designed to differentiate between a person signing up for an account and an automated computer process. This system presents an image of a word deliberately blurred and disfigured so that it cannot be readily identified by a computer, which can only be translated by a human user. This presents an obstacle to people with a visual impairment, particularly those relying on transcription software that will, by design, not be able to read the image, as well as those with dyslexia who may also have trouble translating the image on the screen.

Virtual Worlds and New Possibilities

The development of complex online virtual worlds such as Second Life presents their own set of challenges for access, for example, the use of Captcha. However they also afford opportunity. With over a million residents, there is a diversity of creativity. People are using Second Life to try on different identities or campaign for causes relevant in the real world. For example, Simon Stevens (Simon Walsh in SL), runs the nightclub Wheelies in the virtual world and continues to use a wheelchair and

helmet in SL – similar to his real-life self:

> I personally changed Second Life's attitude toward disability when I set up 'Wheelies', its first disability nightclub. This was one of those daft ideas which grew and grew and... has remained a central point for disability issues within Second Life. Many new Disabled users make contact with me for advice and wheelies has helped some of them 'come out' and use a wheelchair (Carter).

Able-bodied people are also becoming involved in raising disability awareness through Second Life, for example Fez Richardson is developing applications for use in Second Life so that the non-disabled can experience the effects of impairment in this virtual realm (Cassidy)

Tertiary Institutions are embracing the potential of Second Life, utilising the world as a virtual classroom. Bates argues that Second Life provides a learning environment free of physical barriers that has the potential to provide an enriched learning experience for all students regardless of whether they have a disability. While Second Life might be a good environment for those with mobility impairment there are still potential access problems for the vision and hearing impaired. However, Second Life has recently become open source and is actively making changes to aid accessibility for the visually impaired including an audible system where leaves rustle to denote a tree is nearby, and text to speech software (Sierra).

Conclusion

Goggin and Newell observe that new technology is a prominent component of social, cultural and political changes with the potential to mitigate for disability. The uneven interface of the virtual and the analogue, as demonstrated by the implementation and operation of iTunes, indicates that this mitigation is far from an inevitable consequence of this development. However James Edwards, author of the Brothercake blog, is optimistic that technology does have an important role in decreasing disability in wider society, in line with Finkelstein's third phase:

Technology is the last, best hope for accessibility. It's not like the physical world, where there are good, tangible reasons why some things can never be accessible. A person who's blind will never be able to drive a car manually; someone in a wheelchair will never be able to climb the steps of an ancient stone cathedral. Technology is not like the physical world – technology can take any shape. Technology is our slave, and we can make it do what we want. With technology there are no good reasons, only excuses (Edwards, "Technology").

Internet-based technologies have the potential to open up the world to people with disabilities, and are often presented as a way to eradicate disability as it is socially

constructed. While Finkelstein believes new technologies characteristic of the information age will offset many of the prejudicial attitudes established during the industrial revolution, where technology was established around able-bodied norms, the examples of the iPhone and Captcha illustrate that digital technology is often constructed in the same social world that people with disability are routinely disabled by. The Lectopia system on the other hand enables students with disabilities to access lecture materials and highlights the concept of universal access, the original ideology underpinning design of the Web. Lectopia has been widely utilised by many different types of students, not just the disabled, who are seeking flexibility. While we should be optimistic, we must also be aware as noted by Goggin and Newell the Internet cannot be fully accessible until disability is considered a cultural identity in the same way that class, gender and sexuality are. Accessibility is a universal design issue that potentially benefits both those with a disability and the wider community.

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