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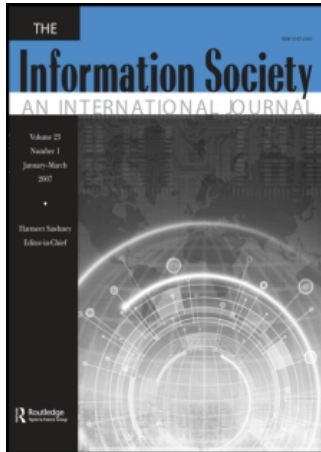
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The Business of Digital Disability

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The paradox of disability and inclusive information technology is considered. If we are now possessed of greater knowledge about disability and design, why is accessible and inclusive technology so difficult to bring about? Is it because inclusive technology is not profitable, and so unattractive for businesses and unsustainable as an industry? Or is the answer more education and awareness? This paper seeks to reframe dominant approaches to disability, information technology, and policy, by offering a thesis centred upon the power relations of disability and the crucial role played by disability's cultural and social constitution. In explaining and testing the theory, we look at case studies from telecommunications, mobile phones, and the Internet.

Keywords access, digital technologies, disability, equity, inclusive technology, information and communications technologies, Internet, telecommunications

THE PARADOX OF INCLUSIVITY AND INFORMATION TECHNOLOGY

Information technology (IT) and communication technology are dominant themes of our age. IT and digital networks form the nervous system not only of the economy but also of our society. We use computers in all sorts of factory, office, domestic, community, and health settings. The Internet, mobile phones, and other networked IT technologies are part of the texture of what we do, of how we communicate, think, and feel. Information technology is

also central to disability, and how it is conceived, experienced, and framed in society.

The intimate link between technology and disability is found in a wide range of technologies adopted, consumed, and used by people with disabilities, who do so in unexpected and innovative ways, often unforeseen by the designers and promoters of such technologies. Many technologies intimately associated with our bodies—such as those pharmacological, machinic, or informatic assemblages classed as medical technologies—have a complex relationship to impairment and disability because they alter the balance between death and life (at least they do so for those countries or individuals who can afford them). Delving more deeply inside the body, developments in genetics and biotechnologies raise profound issues of ethics, values, and power, at which disability is often pivotal—yet this is still too infrequently credited and pondered (Newell, 2006). In all this, disability is customarily invoked as a warrant for development of new technologies, from biotechnology to information and communication technologies, and “smart homes.” Such claims are rarely analyzed and interrogated. Nor are the unexpected uses and ends of these technologies scrutinized. This is surprising for many reasons, not least that the introduction of new technologies often creates new forms of exclusion for people with disabilities.

Perhaps we can tell a story to illustrate this argument. En route from Australia to Winnipeg, Canada, to attend the May 2005 summer institute in disability studies, *Inclusive Information Technology and Business Success*, convened by the University of Manitoba, one of us (Goggin) arrived at Vancouver airport with our colleague and technology expert Tim Noonan to catch our flight to Winnipeg.¹ Stepping out of the airport bus, and walking inside the airport, Goggin and Noonan were rather disoriented by how to proceed. In front of us were a row of self-service kiosks, with signs indicating we should use these for check-in,

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rather like machines now found at various airports around the world. The only traditional check-in counters were located a very long way away, on our far right. We hesitated to head for these, as very few people, if any, were checking in there.

We wavered at the self-service kiosks just long enough for a friendly airline staff member to assist us. As we stood in front of a touch-screen machine, we were tutored in how to enter our booking reference number, how to navigate menus, check where we were seating (with a map), and print out a boarding pass. As conscientious delegates to a meeting on accessible information technology and business success, we posed the obvious question to the airline customer service representative: Why is the machine not accessible? And what if a Blind person was traveling by him- or herself? If that were the case, the staff member replied, we would be able to proceed to the one, well-camouflaged, customer service stand, where assistance were offered by a human being.

We collected our baggage, and proceeded to the next row of kiosks to have our baggage tagged. Before we loaded it ourselves on the baggage carousel, another friendly staff member came over to check whether we needed assistance. We replied that we were fine, but remarked on the lack of accessibility. Her reply was quite instructive: With a wry and long-suffering tone, she said that the point of the new technologies was to cut jobs. The same exchange was repeated at the kiosk, where a friendly staff member did not get the point of our barbed comments about accessibility, and instead lampooned the airline's chief executive officer's propensity for cost-cutting.

While we certainly had some sympathy for the workers' predicament, latter-day Luddites as they were at the front-line of new technologies welcomed by some but annoying for others, we were disappointed, though not really surprised, that their understanding of the power relations of technology did not incorporate disability and accessibility. As Noonan observed, what would be the reaction in 2005 if we turned up to the airport and there were only stairs between us and the check-in counter, or concourses, or to board the airplane? Clearly, more than 20 years after the 1981 International Year of Disabled Persons, information accessibility is still not routinely considered.

This anecdote invokes the paradox of inclusive technology. That is, the arguments for inclusive technology seem compelling, once these are understood. If those inventing, designing, commissioning, implementing, programming, and paying for, information and communication technology, had in mind the needs, expectations, and desires of people with disabilities, then accessibility and use would be incorporated in the technology—rather than having to be an expensive and not particularly compatible add-on, and after-thought. And in addition the technology would be accessible, easier to use, and more attractive for many peo-

ple without disabilities. As a consequence, the argument runs, IT businesses would have more customers, more revenue, and would be more profitable.

While such optimistic thinking is important, change is slow. There are many advances in inclusive technologies—from voice synthesizer technology and the development of screen-readers, accessible payphones, and hearing aid compatibility of telephones, to Microsoft making its Windows operating system accessible, the World Wide Web Consortium's accessibility initiative, and, the inclusion of screenreader capability into Apple Mac's 2005 Tiger operating system. Yet again and again, reflecting the routine social exclusion illustrated in our airport technology story, the introduction of new technologies sees people with disabilities overlooked, omitted, neglected, or not considered.

This creation of inaccessible technologies has profound economic, social, cultural, and personal costs, not least lost business opportunities. The elusiveness of inclusive technology is especially regrettable in the case of information technology, because of the extraordinary potential this branch of technology holds. Full social participation increasingly requires knowledge of, skills in, and affordable access to effective IT. Despite the scholarly and policy interest in inclusive IT, we believe that academic, activist, industry, or government theory has yet adequately to account for what is going on at the nexus of disability, accessibility, and technology. At the outset one of the difficulties here worth highlighting relates to the problematic nature of accessibility as a concept. Any description or account of what is accessible is only provisional and relational, rather than a given attribute of technologies (behind this is the standpoint that technology is a product of social relations). This means that the binary between "accessible" and "inaccessible" technology is part of the problem that needs to be addressed.

THE TURN TO BUSINESS, AND AWAY FROM THE STATE

Since the late 1990s there has been a marked, global turn towards a reengagement with business, and away from seeing the state as the preeminent locus of initiative and power. Our generalization doubtless excludes much detail, but the lines of a new paradigm are clear. In the 1980s, and 1990s, disability movements in different parts of the world sought to achieve recognition by society of disability discrimination and inequality, and sought basic or general legislation to symbolize this sea change, as well as to provide a framework for enacting rights, legal redress, and social change. Specific laws passed included the *Americans with Disabilities Act* (ADA) (1990), the *British Disability Discrimination Act* (1995), the *Australian Disability Discrimination Act* (1992), and the *Canadian provincial Ontarians with Disabilities Act* (2002) and subsequent *Accessibility for*

Ontarians with Disabilities Act (2005). Human rights and general discrimination legislation in many countries has also been amended.

As we have examined elsewhere (Goggin & Newell, 2003), such legislation has played an important role in highlighting accessibility to and inclusiveness of information technology. In telecommunications, for instance, there has been much debate, policy initiative, and some genuine recognition of the importance of understanding the needs and desires of people with disabilities, and the need to incorporate their perspectives into the processes of design and technology innovation and production. Yet change has proven frustratingly slow.

We suggest two reasons why this situation is so. First, there is a long debate about to what extent changes in law result in social change. Second, even when changes in law regarding disability and human rights have some benefits, the implementation and legitimacy of such laws has been highly contested, most damagingly in the United States, with celebrated cases of high-profile celebrities such as Clint Eastwood challenging the legitimacy of such rights (Johnson, 2003). Less obvious rearguard action against accessibility requirements codified in new laws and policy has been industry's either outright opposition, passive ignorance, acts of omission, or unwillingness to embrace required change. Inclusive technology seems to be something that requires considerable resources on the part of those supporting this objective, not least because legal, regulatory, and policy processes are often time-consuming and expensive.

There has been considerable frustration with the slowness of change in the achievement of accessible and inclusive technology. This discontent generated a strong interest in dealing directly with those designing, making, implementing, and distributing technology. The disability proponents sought to convince the industry about the benefits of incorporating accessibility and inclusivity in the design process, especially in the earliest conceptualization of new products. The general character of such arguments was consonant with the precepts gaining acceptance through various bodies of literature and practice, such as human factors research and user-centered design, but most specifically in relation to accessibility in the universal design movement. To schematize this work, there was much concern with exploring the so-called "demand" side of information technology—arguing that people with disabilities were left out of the technology innovation process, and should, as users, be inserted. A stronger version of this can be seen in work, such as our own, preoccupied with the power relations of technology, and its social shaping, and how people with disabilities are a relatively powerless group in such processes, subject to structures and practices of domination of which technology, especially information and communications technology, is increas-

ingly salient. What may well have been left out in all of this discussion are two things.

First, industrial players, and often policymakers, continually requested clearer economic and commercial information on "markets" for technologies, centering on the often asked and argued question: Is it profitable to make technologies inclusive? If so, which technologies and how exactly? What's the business case, and what are the numbers? Understandably, the question askers wanted to understand the users and their needs and preferences. What was problematic was that they approached the demand side by constructing quantitative models, with some rather problematic assumptions, about how technologies could be commodified.

Second, implicit in the turn to engagement with business is a realization that the so-called "supply-side" (problematic as this binary is) has not been well conceptualized or understood at all. There are a number of dimensions to this. The design and production of information and communications technologies has grown especially complex with convergence; the relationship between production and consumption has become closer and closer, especially with the emergence of the figure of the "produser" (sic) or user-producer/consumer-producer in Internet technologies and cultures.² Further, notions of disability, accessibility, and inclusiveness have not figured in attempts to map and understand the innovation processes across the research, industrial, and retail complexes of information and communication technologies (despite the important conceptual and research advances in the interdisciplinary literatures on innovation and technology). Finally, notions of the state's role in the regulation of industries and economy have changed markedly, with a shift toward the idea that government "steers" or "facilitates," rather than "owns," "directs," or even directly regulates. Hence, we point to the growth and significance of self-regulation (the idea that industry is best placed to regulate itself, and government's role is to encourage that), especially in ICT industries.

From roughly the mid-1980s to late 1990s, if our very schematic chronology and characterization holds good, there was of course much interaction with business regarding inclusive technology. Yet there also was faith vested in the state as a trump card if negotiations failed. We would point to two classic examples here. First, the discussions between the Blind community and America Online (AOL) regarding the inaccessibility of AOL's user interface, in which the legal stick of the ADA focused the technology company on the carrot of good community relations, brand perception, and public relations, as well as the possible fiscal virtues of retaining and attracting customers and revenue (Goggin & Newell, 2003). Second, the celebrated case of how government laws on procurement, famously the s.508 of the U.S. Rehabilitation Act, used the purchasing power of the state, in the public interest,

to require providers of technology to meet accessibility requirements, alongside other requirements stipulated in tenders (Goggin & Newell, 2003).

What has emerged since the late 1990s is the turn to the business of digital disability. We believe this turn to dialogue and partnership with business is, and will remain, important. However, much is being left out of such a discourse, not least the continuing power relations of disability—and we need to acknowledge and deal with these. To explore this contraction further, we now turn to leading pieces of research delving into the market and business dimensions and rationales for inclusive information technology.

EXPLORING THE PARADOX OF INCLUSIVE TECHNOLOGY

The goal of enlisting business into designing, producing, and marketing inclusive technology has attracted much attention of recent years. There are two important and emblematic pieces of research on this topic, that seek to convince those interested that inclusive technology can indeed be profitable as well as socially desirable.

In 2002 the U.S.-based World Institute of Disability conducted research, based on interviews and conversations with industry and disability activist experts to “discover how leading electronic and information technology (E & IT) companies are successfully making technology accessible, usable, and valuable for people with disabilities” (Tusler, 2005b). The research was published in a study entitled *How to Create Disability Access to Technology* (Tusler, 2005a; summarized in Tusler, 2005b). Among the findings are four tenets we wish to mention here.

First, Tusler argues that companies need to precisely chart and define the disability market, demonstrate the profitability of access, and tie access to mainstream product needs. Second, they need to incorporate accessibility and universal design practices into design. Third, Tusler suggests that “the participation of those directly affected—that is, customers with disabilities—is essential to making products that are useful”—hence the need to focus on “environment solutions to accessibility issues” (Tusler, 2005b). Underpinning this is the need to value disability and people with disabilities, not least because the “challenge of being successful . . . has led many people with disabilities to be skilled problem solvers and consumers—making them valuable assets for companies that wish to be successful” (Tusler, 2005b). Fourth, Tusler focuses on the *realpolitik* of corporate structure and culture. He underlines the importance of “Accessibility Champions” in organizations, and, more pervasively, writes of the need to transform companies, “to weave accessibility into the DNA of the company” (Tusler, 2005b). Key to such a fundamental paradigm shift in business culture is publicizing

and marketing a company’s accessibility policies and products internally and externally (Tusler, 2005a). The point of such efforts by business lies ultimately, Tusler seeks to persuade his corporate readers, in their own industrial sustainability and profitability:

After all, older people and people with disabilities buy and use products for the exact same reasons as the young engineers. The need and desire to communicate, create, and be entertained is universal. Companies who survive and prosper will pay attention to universal needs of all. (Tusler, 2005b)

The World Institute of Disability report seeks to install notions of accessibility and the profitability of inclusive technology in the discourses of business leaders and commercially-oriented technologists and designers themselves. In addition, it aims to provide a tool kit for disability organizations and activists to enable them to understand the life worlds of corporations and to achieve change in them. In both of these respects it is very useful. However, we would also point to some limitations of the report’s framework and concepts. In our view these revolve around the report’s taking-for-granted of the dominant self-conceptions of corporate culture and markets, rather than analyzing and interrogating these. Take, for instance, the pithy and memorable adage that companies serious about inclusive technology need to “to weave accessibility into the DNA of the company” (Tusler, 2005b). As a motto to insert into management discourses, this is certainly a striking one. Yet it is also quite misleading. The metaphor is one taken from genetics—ironically a technology system and discourses in which disability is very problematically shaped—and suggests a sociobiological account of corporations. That is, the makeup of companies is fundamentally shaped by a set of codes, and if one could just ensure accessibility is one of these, corporate culture would be transformed. Our problem with talking about accessibility (and, impliedly, disability) in this manner is that it ignores the social shaping of accessibility itself, as well as the complexity and contingency of corporate structure and practice. To conceive accessibility in this way is potentially to put it beyond the domain of the social, and to miss crucial dimensions of the power relations involved in the constitution of corporations, technology, and market.

To shed light on the specifics of how technologies come to be viewed as profitable commodities, we turn to a roughly contemporaneous report. This is the comprehensive 2004 U.S. National Council of Disability (NCD) report *Design for Inclusion: Creating a New Marketplace*, which really seeks to come to grips with the innovation, research, and production systems that determine inclusive technology, and the logics and constitutions of markets for inclusive technology. In an innovative approach, *Design for Inclusion* was based on an extensive research program, examining the roles and perspectives of industry, federal

government, and consumers with respect to six product lines important to people with disabilities: automated teller machines (ATMs), cellular phones, distance learning software, personal digital assistants (PDAs), televisions, and voice recognition technologies.³

The starting point of the NCD report is a mapping of the relevant trends in information technology. For our purposes here we would note four of these trends. First, to increase profitability, companies need to move into emerging world markets, where consumers have relatively low incomes and literacy levels, “in order to increase sales and gain competitive price advantage through economies of scale” (NCD, 2004, p. 43). Second, improvements in capabilities are “enabling developers to integrate advanced access technologies (speech recognition, text-to-speech synthesis, projected displays . . .) into devices where it had not previously been technically possible to do so” (NCD, 2004, p. 43). Third, “Customers’ technical knowledge and expectations are constantly increasing, along with the use of wireless Internet appliances and wireless infrastructures” (NCD, 2004, p. 43). Fourth, “[l]egal mandates to manufacture more accessibly designed E & IT in support of people with disabilities are a driving force behind these technological trends” (NCD, 2004, p. 43). As part of its research, the NCD conducted a user study that found, among other things, that users with disabilities are often asked to pay high prices for phones with feature sets that are not useful to them; rapid changes in technology often cause decreases in accessibility; users are reluctant to adopt technologies that have proven frustrating in the past; and users are reluctant to invest in technologies with an unproven accessibility record (NCD, 2004).

There are a number of notable findings in this research concerning inclusive technologies: first, that a market for universally designed products and services does exist; second, the proposition that universal design principles can be easily incorporated into current design practices; third, that products designed to be accessible sometimes do not actually meet the needs of users with disabilities; fourth, that many barriers to universal design remain and must be addressed before progress can be made; and fifth, and rather controversially, that legislation is both a facilitator of and barrier to universal design (NCD, 2004).

In its view that legislation is not anymore the main answer, a standpoint heretical no doubt for many disability activists, NCD places much weight upon standards. NCD suggests standards could be used to “prohibit nonessential features that pose accessibility problems” and “to eliminate interoperability problems that create accessibility problems” (p. 17). As well as standards, NCD also emphasizes the use of market forces, such as consumer information practices and selling practices (for example, labeling and warranty features). To facilitate the demand, or consumer, side of market forces, NCD recommends the

development of information clearinghouses for user information on accessibility issues, marketing strategies and approaches that “will facilitate a connection with people with disabilities” (p. 20), and the training of people with disabilities as “subject-matter experts” to participate in design focus groups and accessibility evaluations (p. 20).

Both the World Institute on Disability and National Council of Disability reports offer a compendia of strategies in the quest to achieve inclusive technology, through strengthening the commercial profitability and sustainability of IT. We also see them both as representative of a particular discourse on business, disability and technology. The lesson both appear to offer is that one can both do good (through inclusive technology) and make money at the same time. Or, in the strong version of the claim, doing good in this manner *can and will* make one *more* money.

To bring about inclusive technology, it might be noted, requires much coordination, commitment, and action between and among noncommercial as well as commercial sectors, institutions, and actors. Kate Seelman has offered a thoughtful discussion of the respective place of universal design, assistive technology, and “orphan technology” and their respective markets, placing the U.S. experience in international context (Seelman, 2005). Certainly standards play a pivotal yet thorny role in this. For instance, it may be argued that unless standards are referred to in legislation, their adoption is likely to be minimal. Further, there is a sense in which standards indicate, or require, a minimum set of attributes for a technology, but often this turns on making products safe rather than accessible (as the history of standards bears out).⁴ In response to such suggestions, we would also note that the relationship between standards and legislation varies across jurisdictions.

To explore more fully the contemporary dilemmas of inclusive technologies we now wish to turn to this knotty problem of shaping inclusive technologies, paying particular attention to networked digital technologies.

DISABILITY, TELECOMMUNICATIONS, AND MOBILES

As is evident from the foregoing discussion of research on inclusive technologies, much discussion of developments of the information and communication technology industry focuses on the world’s industrial powerhouses, especially the United States. This is certainly important, but there is much to understand and debate in the experience of other countries and regions—such as the place in which we live and work, Australia. Like its Commonwealth counterpart Canada, Australia has a relatively small population but medium-sized economy and domestic market, not to mention very large land mass, by global standards.

In Australia the telegraph was instrumental in the political movements that led to the federating of colonies

into a nation in 1901. Throughout the 20th century the telephone became important—if relatively unnoticed—to how the country conducted its business, and how people communicated with each other. With the advent of the great telecommunications reforms in the 1980s and the 1990s, many of the taken-for-granted assumptions about the telephone were dismantled. Cell phones were introduced in 1987, competition in telecommunications was introduced in 1991, networks were digitized, the Internet became a mass, customized medium, digital television became a reality, and all manner of new technologies were introduced.

As we have chronicled elsewhere, in Australia, the legislation ushering in competition, the 1991 *Telecommunications Act*, featured a definition of universal service that mandated the delivery of standard voice telephony service throughout Australia, but explicitly separated the universal availability issues from accessibility (Goggin & Newell, 2000, 2003). Accessibility was not part of the universal service obligation. Instead, the government undertook to provide funding for accessibility as one of its “community service obligations.” In a time of stringent fiscal management, no such funding eventuated for a number of years. Telecom Australia (now Telstra), the government-owned former monopoly carrier, was encouraged to continue operating its own “concession” scheme to give people with disabilities access to the telecommunications network. Telstra did not, however, make telecommunications accessible for Deaf people and people with speech disabilities requiring text telephony equipment (known in Australia as teletypewriters or TTYs).

Just as disability was not included in the 1991 *Telecommunications Act*, so too telecommunications was explicitly left out of areas named as being important and worthy of disability standards in Australia’s 1992 *Disability Discrimination Act* (indeed, the then government sought to have telecommunications exempted for a period of time). Eventually, however, a Deaf man, joined by Disabled Peoples International (DPI) (Australia), the then umbrella organization for people with disabilities and their organizations, successfully launched an action against the then Telecom Australia in the Human Rights and Equal Opportunity Commission (HREOC) (*Scott, DPI v Telstra*). This decision required Telecom Australia to provide accessible teletypewriters. It also resulted in a change to government policy, with the requirement in the *Telecommunication Act 1997* that the functional requirements of people with disabilities be included in universal service provision. This act broadened the definition of the standard telephone service to include another form of voice communication that is equivalent to voice telephony, if voice telephony is not practical for a person with a disability. The incorporation of disability into the legislative framework was strengthened with the 1999 *Telecommunications (Customer Protection and Service Standards) Act*.

In this first, long phase of Australian developments in inclusive technologies, we can observe a great deal of resistance on the part of the dominant carrier, and much indifference on the part of new entrants, for the possibilities of inclusive technologies. The state and the industry both shared tacit assumptions that disability was an extra cost and nuisance, and that it should not be allowed to interfere with the historically significant task of telecommunications reforms. It was not, as both government and industry deeds demonstrated, deemed to be in the national interest. In response, the disability and consumers movement mobilized, and focused on the state and its laws and policies as the overarching framework that needed to be changed, to set an equitable environment for consumers and industry. What has emerged since this period is a fascinating mixture of both “business success,” on the one hand, and “market failure,” on the other hand.

One of the features of policymaking from at least 1995 onward around the world is the rise of what is called “self-regulation,” where responsibility for a number of areas of regulation has been given to industry itself. Consultative fora, including consumer representatives, have assumed greater importance because they have taken up some of the regulatory and policy-formulation roles previously played by the state and its agencies. In Australia, for instance, the Australian Communication Industry Forum (ACIF), an industry self-regulatory body established in 1997 by the telecommunications industry, assumed responsibility for developing regulation in many areas previously governed by the government and industry. ACIF also was given responsibility for initiating regulation in areas not previously subject to any state or self-regulation. ACIF’s role is to develop and administer technical and operating arrangements that promote both the long-term interests of end-users and the efficiency and international competitiveness of the Australian communications industry. This primarily involves developing standards, codes, and other documents to support competition and protect consumers, as well as compliance, and the cooperative resolution of strategic and operational industry issues.

ACIF’s task is quite a difficult one because it attempts to harmonize and gain consensus across a plethora of commercial providers with a bewildering array of technologies and services. It has been widely criticized, nonetheless, for its poor track record in developing codes of practice—its central regulatory contribution. One area where it has achieved some success, however, has been in the area of disability. Here ACIF established a Disability Advisory Body, which uses people with disabilities as experts who work collaboratively with those designing guidelines and regulations that shape not just Australian telecommunications but how those communication systems interface with other technologies. The majority of members of the Disability Advisory Board (DAB) are drawn from

broadly represented organizations and chaired by one of us (Newell). The ACIF DAB provides a key meeting place for consideration of not just current but future telecommunications issues. Examples of its work include the 2001 *Access to Telecommunications for People with Disabilities Industry Guidelines* (ACIF, 2001), and the *Any-to-Any Text Connectivity Options Working Group* (Newell, Goggin, Astrink, & Raiche, 2004).

Despite these positive initiatives, we regret to report that the place of people with disabilities, accessibility, and inclusive technology in such crucial sites and institutions of self-regulation is very fragile and contingent. In this second long phase of telecommunications reforms—characterized by “open competition” (that is, the reshaping and reregulation of markets around competition policy and world trade rules, and their contradictory implementation), by rhetorics of self-regulation and realities of co-regulation, by the massive and complex process of convergence of telecommunications with other media, technology, communication, information and entertainment platforms and industries—disability still remains poorly understood by business actors and corporations. Thus, for instance, disability and accessibility are still not routinely considered by most companies in the ICT industries in Australia as a mainstream issue.

One example of this can be seen in the case of mobile phones (“mobiles”) and wireless devices, an important area given the continuing shift from landline telephony and telecommunications networks. There has been extensive work in Australia by disability and consumer groups and researchers to engage with telecommunications companies since the early 1990s at least. Some corporations, not least the still-dominant national carrier Telstra, have developed accessible or inclusive technologies for different groups of consumers, such as offerings for Deaf consumers who have avidly taken up short message service (SMS), also known as text messaging. New entrants into the mobile market, including Vodafone and the Hong Kong-based 3G provider Hutchinson (pioneering third-generation mobile services in many markets internationally), have explicitly engaged to some extent with consumers around inclusive technologies. In general, however, Australians with disabilities are underrepresented in the takeup and use of mobile and wireless technologies. This is despite the fact that, like other users with disabilities elsewhere, those able to use the technology often do so in very significant and creative ways—a phenomenon that could profitably be incorporated into technology innovation cycles.

As we have discussed elsewhere, the needs and desires of hard-of-hearing and Deaf cell-phone users were not initially understood nor envisaged as part of the design of second-generation digital mobile networks; thus, design and consumption issues pertaining to Deaf consumers have not been widely noticed and discussed, and networks and

devices were introduced that hampered, restricted, and denied their use of mobiles (Goggin & Newell, 2006b). Once Deaf people did find ways to access digital mobile networks, they become avid users of text messaging. The history of text messaging is fascinating and instructive in its own right for what it tells us about the relationships between society and technology, users and designers, and customers and businesses (Goggin, 2006; Taylor & Vincent, 2005). The Deaf invention of text messaging is also part of this story (Goggin & Newell, 2006b), and while it has attracted quite some attention, its implications for the business of digital disability have not yet been grasped. We would argue that while mobile carriers and equipment vendors did belatedly realize that Deaf people were a potentially significant market for mobile data and subsequently modified and promoted messaging accordingly, they did not really take the opportunity to insert Deaf use, and profiles and concepts of use, into their design, planning, and implementation of new mobile technologies.

The lack of attention given to disability and inclusive technologies in mobiles is further highlighted in the case of Blind consumers of mobiles, who have been very much neglected by mainstream mobile telecommunications providers and equipment manufacturers as messaging cultures and practices have grown up around them.⁵ In this case, there have actually been a number of market responses. For example, in 2003 a Spanish technology company announced the world’s first mobile phone specifically designed for Blind people (Adams-Spink, 2003). It is not clear to what extent Owasys’s dedicated product has been taken up by Blind users, or whether most are more comfortable with a screen reader or application option (at least those who can afford it, and have the skills and training to use it). One difficulty may be slow and costly progress on approvals in different countries. In addition, the Owasys phone has fewer features than a phone running a screen-reader, and is priced similarly to a high-end phone plus screen-reading software (see Goggin & Newell, 2006b, for further discussion).

THE COCREATION OF DISABILITY AND TECHNOLOGY

We have only touched briefly upon the complex issues concerning disability, accessibility, and inclusive technology. There is much more to say, of course, especially in the burgeoning area of the Internet and associated convergent media. There is a major study to be written about the social shaping of the Internet and the blossoming of its various technocultures and imaginaries, and how disability and accessibility is now being constructed in these spaces. The Web Accessibility Initiative of the World Wide Web Consortium (W3C) is the best known example of inclusive Internet technology, all the more significant because

of the centrality still of the web to our experience of the Internet. There is much more unfolding with the Internet that holds such promise and yet such disappointment for people with disabilities, but there is little critical—let alone comprehensive—examination of such developments (some exceptions being Goggin & Noonan's 2006 discussion of blogging and disability, Stienstra and Troschuk's 2005 account of disability and eDemocracy, and White's 2006 pioneering piece drawing upon concepts of disability to rethink embodiment generally in computing culture). Discussion of disability and the Internet is all more important given the fundamental shift of telecommunications and broadcasting networks to be based upon the Internet Protocol.

Mention of the Internet underscores the fact that we have moved a long way, it would appear, from expecting our national governments, as symbolized by the post-World War II visions of the welfare state, to provide service and pay for or legislate inclusive technology. With the failure of inclusive technology to materialize in a widespread way after general disability discrimination laws were passed in the last 15 years, or sector-specific legislation called for measures, especially in telecommunications and networked digital technologies. The spotlight has swung away from focusing on the state, to focusing on business. Instead of compelling business to do things, or expecting altruistic actions for good corporate citizenship reasons, disability proponents are now asking them to do so out of their own self-interest. As we noted earlier, there is promise in this new conversation on business and inclusive technology.

Incorporation of disability into all aspects of the design and shaping of technology—as thematized by universal design, and debates over the relation of this to assistive technology—is an obvious place to start. So too are the many strategies that large, medium, and small businesses can adopt to make inclusive technology a reality, in their own interests and those of their shareholders. Here we may well be only at the beginning of understanding how the social and cultural shaping of disability and technology, and so have much to discover. We are reminded of the work of the French scholar of science and technology, Bruno Latour. To delve into how technology is created, in his book *Aramis, or the Love of Technology* he studies not a “successful” technology, but an “unsuccessful” one. Latour's motto and method is quite simple: “Follow the actors.” Those who have an interest in the technology, who are the actors, can tell us what we need to know about the strange and contingent ways that technology is created (for actor-network inspired readings of disability and technology, see Campbell, 2005; Moser, 2005, 2006).

For all this, we are also skeptical about the new turn in inclusive technologies in which engagement with business is recommended, as we have detailed in this article. We have ourselves worked directly with corporations for many

years, seeking to find a bridge between different worlds and positions and to promote the importance of understanding disability in conceiving technology. There are definite limits, however, and power relations that cannot be wished away. Our discussion of the two U.S. reports on the potential of markets for disability acknowledges the importance of such work, but departs significantly from its underlying assumptions. In particular, we would argue that the market is intimately connected to the domains of the social and cultural—indeed, shaped and saturated by these. As such, a new approach to grasping and reframing the economics and markets of disability and information technology must go hand-in-hand with new modes of interaction with the state as well as other spheres of society.

In such a contemporary situation, we are plunged deep then not only into the complexities of sustaining IT industries in our globalized world (Sassen, 2006), but also the new sorts of relationships among governments, businesses, and civil society (or third-sector organizations, or nongovernmental organizations [NGOs]) that we are seeing emerging (cf. Stienstra, Watzke, & Birch, 2007). As much as we need a market-driven approach and self-regulation, we also require the guiding, custodian, and directive roles of our standards-setting bodies, regulatory agencies, and governments. In short, we need effective, strong models of how to institute and foster partners—in short-hand, co-regulation. Disability can be fruitfully inserted into national policy on innovation systems, technology, and economy. Our research institutions, especially universities, play an important role here, and the humanities and social sciences, especially disability studies, and social studies of science and technology do so no less than the sciences and technology disciplines.

However, there really is something else. Throughout this article, we have insisted on the importance of recognizing and attending to the power relations of disability as the key. To bring about technologies that include all—and to honestly recognize the exclusions such endeavours will inescapably bring, despite the best intentions—we believe there will be a need for a long time to come to openly, honestly, and generously discuss matters of power, injustice, and practices of exclusion. As part of that we will also need to revisit what it is we mean by inclusion and how too often we leave un-reformed the exclusionary power relations and technologies that require inclusion in the first place.

People with disabilities still face a long struggle to be accepted in society, as equal members of their national communities and cultures, as we have argued in our study of disability in Australia (Goggin & Newell, 2005a). The United Nations is formulating a long-overdue Convention on the Protection and Promotion of the Rights and Dignity of People with Disabilities, and we hope this international instrument will motivate disinterested national governments, like our own at present, to improve

domestic human rights implementation. At an everyday level, we need to continue to devise genuine partnerships between people with disabilities, and those who do not identify as people with disabilities—to establish and maintain relationships, in service of ending oppression and the structures and practices that perpetuate it.

International trade rules, standards-setting activities, and the power of transnational corporations mean that national actors need be all the more creative in their activities of government and policy formulation. If it is worth considering integrated and comprehensive national responses to technology, such efforts must genuinely incorporate people with disabilities and their needs, desires, and expectations.

NOTES

1. For the other author of this article, Christopher Newell, international travel to participate in scholarly colloquia is an extremely expensive, fraught with difficulties, and exhausting affair, highly dependent on the health care systems and policies of the host country, the practices of the airlines, and the approaches of conference organizers.

2. We note that the contemporary emphasis on the power of consumers assumes financial resources, yet the implications of this for work and employment have not yet been given the attention they deserve. If people with disabilities are excluded from the workplace by virtue of the fact that they cannot access the tools of work, then it is clearly difficult for them to be transformed into “consumers” and a “market.”

3. For further discussion of the research approach and methods and the report’s user study, product analysis, and industry studies, see http://www.ncd.gov/newsroom/publications/2004/online_newmarketplace.htm#sectionb.

4. Our thanks to an anonymous reviewer for a number of helpful observations on the role and nature of standards.

5. In our contrasting discussion here we are mindful of the problematic, dynamic, yet intensely invested categories of “Deaf” and “Blind”, and the entire vexed taxonomic enterprise of knowing the truth of a person via an impairment label (for a discussion of this see the opening chapter of Goggin & Newell, 2005a).

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