

The Culture of Accessibility

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Abstract

What is a 'normal citizen'? Over the past century the perceived value someone can have on society has developed, however the inequalities that were present at the turn of the 20th Century are still resonating within today's societies, especially within the digital world. By exploring the relationship between the development of working practices and the changes within society, this thesis will examine how economic value and social power has dictated the thinking of a mass culture to exclude certain groups. This is a problem that has started to be addressed by the governments of the developed world, however they have fallen behind with technological advancements, meaning that those creating goods for the digital world are not governed by the same legislation that those producing goods for the physical world are. The thesis continues by looking at these issues in relation to the internet and how the development of technology has started the dissemination of this power to create a more accessible experience for all.

Users of the internet are now becoming aware of the needs of the disabled users and this thesis explores the ways in which the online community is aiding them and how companies are harnessing this community effort to further their own offerings. It concludes with how the internet as a whole is progressing with greater accessibility in mind, and the current issues which surround this progression.

Introduction

We tend to take it for granted that technical innovations will make our lives easier and more convenient; but that isn't always the case for everyone. In fact, a host of alleged upgrades are actually alienating the 2 million people in the UK (and the 314 million worldwide) who are visually impaired. (Shipley 2008)

During the last century the distribution of power within industry has shifted, however there is still a culture of excluding people who are not seen to conform to the ideal standard of a 'normal citizen'. These changes have been made possible by the use of technology to distribute knowledge which has led to more jobs being available for those with a disability; however there is still an inequality which has resonated through history. Due to common perceptions of the disabled there are still many barriers, both in work and society, which stem from the traditional notions of power and wealth distribution. Whilst technological advancements are being made, there is an increasing cost, not only financially but also on a social and cultural level. Adrian Farnsworth explores this in his article *Whiteboard Access*¹. He acknowledges that there have been many changes that aid the integration of those with disabilities into schools, 'to the point where, about a decade ago, they could fully participate in and access the curriculum' (2008). However with the introduction of the electronic whiteboard, 'these huge leaps are being seriously eroded' (2008)². Very similar issues surround the accessibility of the web. During the mid-late 1990s the internet was extremely accessible; there were many devices available, such as screen readers, to aid the visually impaired, whilst the websites themselves were also very accessible due to their simplicity.

Over the last decade the number of technologies available for web developers has increased, primarily due to the development of existing technologies such as Asynchronous JavaScript And XML (AJAX) and browser plug-ins such as Flash and Silverlight. These have all contributed to the increasing gap between accessible and inaccessible content. The fast pace of development on the web means that

¹ Adrian Farnsworth is a City Resource Officer for the Sight Impaired in Derby.

² An electronic whiteboard is used within the classroom to allow the projection of websites and computer slides whilst having the ability to annotate and make notes similar to a traditional chalkboard. It has the advantage that everything written can be saved for reference at a later date.

accessibility for users with impairments has been hindered. Designers are keen to utilise emerging technologies, yet they often fail to acknowledge that some users may be unable to exploit them. Consequently, it is difficult for the manufacturers of Assistive Technologies (ATs) to create the solutions needed³.

To understand why the gap between technology and accessibility has arisen one must look to a broader context and examine the way in which societies and cultures develop; when this is understood, it will become easier to relate the development of technology to the exclusion of those with impairments. Dick Hebdige, in his essay *Culture* states, 'everything in everyday life is dependant on the representation which the bourgeoisie has and makes us have' (1979). The bourgeois or high-class society determines how people think about certain issues; today this could be re-read to suggest that large corporations have an influence or control over their customers. This can also be seen within the internet; thought of as an open, flat, decentralised network there are actually many levels of power within it, both structurally and in the consumer experience. This has become apparent recently in the fight against copyright within New Zealand, as the Internet Service Providers (ISPs) are introducing a graduated response to those suspected of copyright infringement, resulting in the user's internet connection being removed.

The current lack of accessibility on the web was highlighted in a recent court case between the American supermarket Target and the National Federation of the Blind (NFB). The plaintiffs argued that the law in California (where the lawsuit took place), which states that shops should be accessible for all, should also be extended to incorporate shop websites. The case was settled out of court on August 27th 2008, when Target agreed to work with the NFB to make its website one of the most accessible for ATs on the web (Danielsen 2008).

From a technical point, the issue with making applications accessible is primarily financial, as it involves greater development time. In the 1990s accessibility was achieved with relative ease, simply due to the limitations on what was possible at the time. For instance, a web page would load and remain in the same state until the page

³ Assistive technologies, as described in detail in later chapters, are devices used by those with a disability to allow them to operate a computer.

was refreshed or changed. As a result of this ATs such as screen readers worked very well⁴. Although this is still the case, large portions of many modern websites are now being missed by impaired users due to the implementation of technologies such as AJAX, which allow content to be updated on the screen without the whole page being refreshed. These areas, updated ‘on the fly’, are known as live regions and although the Websites Accessibility Initiative (WAI) has issued guidelines, these are not well known and very few developers implement them.

Chapter one of this thesis explores the history of the factory and the models used to structure businesses including Fordism and Toyotism. It continues by looking at how work has spread from a single place into society, creating a Social Factory where all work is seen to have a value, know as and ‘immaterial labour’. The chapter looks specifically at how the practices utilised in the work place are reflected in society before proceeding to put these in the context of networks and the internet, introducing the notion of a power and wealth divide which has been brought through history into modern society.

Chapter two continues this investigation by looking at accessibility in both general society and within the digital arena. The chapter starts by detailing the history of accessibility, before exploring the definition of a disability and how it differs around the world. It concludes by looking at how technology is helping those with a disability to play a greater part in society.

Chapter three investigates the law that surrounds accessibility, both in the physical and digital worlds. Paying close attention to how, with the progression of the web and the addition of new technologies in the form of Rich Internet Applications (RIAs), the internet has become less accessible and the issues that these technologies pose, it questions whether it is the technology, or the implementer of it, that is at fault for the inaccessibility.

Chapter four explores the future of the internet and how some companies who can make a difference to accessibility are tackling the challenge through the introduction

⁴ Devices which convert the text on screen into spoken words for the visually impaired to listen to.

of new standards and best practices. The chapter also investigates how some companies are actually adding to the problems faced by those with a disability.

In response to the findings of this thesis, I will set out a plan that I hope will bring the internet more in line with what it was originally intended to be - a source of information that everybody within society, regardless of ability, can take advantage of and utilise to become more informed, therefore levelling the hierarchical power distribution which currently exists.

Chapter 1: The Power of Systems

Technology has, throughout time, been seen as a tool of empowerment; however the opposite can also be true. In the last century technology has evolved, leading to a change in both society and the distribution of power and wealth. Two main business models have emerged - Fordism and Toyotism. Towards the end of the century the idea of the Social Factory was introduced, changing how work was perceived and where it took place. All three have greatly changed the way that businesses operate and how those businesses view value. By studying the differences between them it is possible to see the correlation between the development of society and the exclusion of certain members who are seen as 'less valuable'.

The first system, Fordism, named after Henry Ford, refers to a management method based on employee loyalty and the production of cheap, standardised parts in high volume⁵. These techniques are credited with making America the most 'dominant capitalist power by the end of World War Two' (MIA⁵). In 1914, to ensure employee loyalty, Ford began to pay his workers a minimum of \$5 a day and reduced working hours from 9 to 8⁶. This transformation in working conditions, along with alterations in the manufacturing process, provided for social change and the 8-hour working day remains standard practice today. By increasing the financial value of employees and reducing the price of his cars, Ford allowed his workers to aspire to purchase one and create a better future for their families. The downfall of Fordism was its reliance on the fact that employees would not question the system. Ford did not allow employees to participate in the development of the company or unionism, even employing spies and company police to ensure this did not happen. This resulted in 'mind-numbing uniformity' and repetition of tasks, illustrated in Charlie Chaplin's film *Modern Times* (1936) where he appears to become part of the machine (MIA⁷). The division of power within Fordism is clear; the manager (Ford) was in charge of every aspect of the business, he did not rely on any other business as everything was created in house.

⁵ Henry Ford was the first owner of Ford motor company. The term Fordism was popularised by Antonio Gramsci in the 1930's.

⁶ \$5 per hour was more than double the average salary for the time.

⁷ marxists.org/glossary/terms/f/o.htm#fordism

Any attempt to shift this balance of power to a more equal standing was crushed as quickly as it started. Within the factory this division was very clear; there were those who were employed to think and there were those to perform the labour. The worker was not expected to think and had little prospect of promotion. Due to the high output and repetitive nature of the work in a Fordist factory there were no positions suitable for the disabled. They were unable to add any financial value to the business, as supported by Burrows and Loader stating that '[e]qual opportunity policies have often been the first to be dispensed with in drives for economic efficiency' (Burrows & Loader 1994: 71).

Toyotism is classed as the 'second most important revolution affecting the organization of work' after Fordism (ILO 2000)⁸. This production method is centred on individuals working within teams to complete a set of tasks - a stark contrast to the Fordist factory where each task was assigned to an individual. Developed in Japan, a country 'grounded in the existence of company unions', it has a flatter hierarchy where there is communication between the workers and all levels of management (Souza 199: 14)⁹. It is seen as an important part of Toyotism to have this communication with both the worker and the unions, as it was believed that the 'the union leader of today may well be the manager of tomorrow' (MIA¹⁰). Self-management is also introduced in Toyotism due to the team-based production method. This means that in the majority of cases if an individual is not working efficiently they will be pressurised by others in the team until they produce sufficient work, change teams or resign. Job rotation was also a key feature in this type of production, however this was also found to 'effectively discriminate against disabled workers' as it required each person to operate in the same way (MIA⁸). Rooted in a 'just in time' method where everything is delivered as it is needed, Toyotism reduces waste and means that the company does not need to store parts, therefore allowing it to react to market changes more rapidly than a Fordist factory, which believes that the supply of goods dictates the market. The reliance on other companies to supply these components is made possible due to the 'culture of labour-management cooperation'

⁸ Toyotism is otherwise known as lean production.

⁹ The difference between Fordism and Toyotism for the individual worker can be seen in appendix 1.1.

¹⁰ <http://www.marxists.org/glossary/terms/t/o.htm#toyotism>

(Souza 1999: 13). Created from ‘multi-skilling and cross divisional problem solving’ between a few skilled male workers and a large majority of part time labourers it uses, ‘half of the industrial workers, half of the space for manufacturing, half of the investment in tools, half of the hours of planning to develop new goods in half of the time (Souza 1999: 13). This ultimately led to a unique cultural divide developing between those who had job security and those who did not. This is reflected in the distribution of wealth and therefore power, meaning that the divide created within the factory is carried over into society.

1.1 Work goes into Society

This continuation into society introduces the ‘Social Factory’, where the definition of worker and labourer begin to blur, introducing a shift in the way social networks are constructed. Up until the 1970s when Italian Autonomists first introduced the term ‘Social Factory’, the capitalist definition of the working class was based on the belief that ‘there are productive workers on the one hand, and on the other, there are the social problems who are a drain on the “society”’ (Cleveland Modern Times Group 1976: 3) ¹¹. This definition concentrates on the capital that is produced solely within the traditional factory however, ignoring the work that takes place within society which also contributes to the capitalist structure. In this way some people were more valuable to capitalism when unemployed or receiving benefits rather than having a more traditional role within a factory. This work is often referred to as unpaid or ‘immaterial labour’, and forms the foundations of the Social Factory¹². In understanding that all labour, paid or otherwise, contributes to capitalism, makes it possible to re-define the working class to include everyone within a society. This introduces a large shift in power, best seen on the internet where many large companies rely on the notion of immaterial labour to make substantial profits. In Tiziana Terranova’s *Network Culture* she uses the example of America OnLine

¹¹ Autonomism is a socialist movement which believes it is the job of the individual to bring about change within a Capitalist society from the bottom up, concentrating on what the individual can do rather than relying on the masses (unions). The Social problems defined by the Cleveland Modern Times Group as those, who were at the time, discriminated against including black people, gay people, and the disabled.

¹² Immaterial labour is a term championed by Maurizio Lazzarato in his essay *Immaterial Labour* (1996).

(AOL) that relied on its community leaders, referring to them as ‘netslaves’, to encourage discussion and therefore revenue (2004: 77). This method of utilising immaterial labour to generate capital on the internet is one that has grown rapidly through social networking websites such as YouTube and Facebook where the main source of revenue is from advertising, relying on the notion of self-organisation with users creating an online community autonomously¹³. These companies do not produce a traditional product or use a creation process that has a physical presence, they are ‘immaterial goods’, and it is the labour which creates these goods that is classed as immaterial labour. The business models utilised by these companies are successful due to the consumers ‘desire for affective cultural production’ and the notion of ‘collective labour’, where many people come together with a common goal (Terranova 2004: 77). For companies it is the processes involved in collective labour that generates the monetary value, often utilising processes that are not traditionally recognised as work, as summarised by Lazzarato:

The activity that produces the cultural content of the commodity, immaterial labor involves a series of activities that are not normally recognised as “work” – in other words, the kinds of activities involved in defining and fixing cultural and artistic standards, fashions, tastes, consumer norms, and, more strategically, public opinion. (1996: 133)

Unlike the more traditional markets that Fordism and Toyotism served, within the Social Factory ‘immaterial labor finds itself at [a] crossroads (or rather, it is the interface) of a new relationship between production and consumerism’ where the ‘worker’ both serves and creates consumer demand simultaneously (Lazzarato 1996: 137). Just as before when the workers role evolved from one based in Fordism to one based in Toyotism, a similar shift can be seen between Toyotism and the Social Factory where the worker now takes on the responsibility of self-management or self-organisation due to the specialist knowledge that they possess, whilst the traditional manager takes on the role of facilitator.

¹³ Self-organisation is an idea based on people organising themselves into a body of people, such as a community or union.

1.2 The Internet as a Tool

As the internet has developed, the ability to share knowledge and quickly collaborate on projects has been realised, referred to as a ‘hive mind’ by Kelly in *Out of Control* (1994), where he introduces the idea of ‘collective intelligence’ in which humans ‘are passing from a Cartesian model of thought based upon the singular idea of *cogito* (I think) to a collective or plural *cogitamus* (we think)’ (Terranova 2004: 85)¹⁴. This has resulted in open-source and free software, which is created and updated by many community members for free. While these two movements help each other, the open-source ‘followers ... prefer to base their arguments on the economic and technical merits of making source code freely available, rather than the moral and ethical principles that drive the Free Software Movement’ (Hicks et al. 2009). Technically, free software must be distributed with the source code available to the user for modification; open-source, whilst encouraging this, does not require it. The largest and best known open-source project is Linux, an operating system to rival Microsoft and Apple. Due to the vast amount of people working to improve it for free, it is always up-to-date with technological changes and often it is this community which takes the technology of operating systems forward. This has led to the larger, traditional companies changing their methods of production and business to embrace this new community and utilise their knowledge. Embracing this new approach to the development of products means that these companies may be losing some of their power and therefore wealth within the market. However, I would argue the opposite; although the community may feel that they are contributing to create a better product for themselves and therefore breaching the barriers of wealth, on a subversive level their participation introduces a new connection to the company reinforcing its power.

The internet can be seen as a global “network of networks” ... [allowing] the formation of a global network culture’ (Terranova 2004: 41). This is different from the web, which is a series of documents served over only one part of it. The internet has been the biggest contributing factor to the Social Factory and can be seen as the driving force behind ‘the globalisation of culture and communication at large’

¹⁴ As is discussed later within this chapter, even though there is an ideal surrounding the collective, within the ‘hive mind’ there remains a hierarchy where some members have more control than others and this therefore leads to an imbalance of power.

(Terranova 2004: 42). This globalisation has seen the more traditional hub of an organisation disperse over several specialised nodes linked via a network. Hardt and Negri highlight this point when they state that '[as] opposed to the old vertical industrial and corporate model production now tends to be organized in horizontal network enterprises' (2000: 296). However I would only partially agree with this. The very nature of a decentralised process leads to a dissemination of power, therefore companies work harder to re-instate this organisational control and regain the power which is lost.

As a system in its own right, the internet has also caused controversy since its creation in 1992 and there are now two extremely contrasting views on the value that it has brought to society. These are identified in *The Net*, a documentary film by Lutz Dammbeck. On one side there are the cyberlibertarians, like Kevin Kelly, who believe that the internet has created a global community making information more accessible and they share an idealistic view that it can only have a positive effect on the world. There is, however, a darker side to this utopia and in the film is reflected in Theodore Kaczynski, otherwise known as the 'unabomber'¹⁵. The bombings were claimed to be in reaction to the way in which technology was progressing within society and also as a way to draw attention to the problems that were arising from a life within the 'industrial-technological system' (Kaczynski 1995: 5). Kaczynski's manifesto (the publication of which was a condition of ceasing the bombings) states that if this system is allowed to survive;

'the next 40 to 100 years, it will by that time have developed certain general characteristics: Individuals (at least those of the "bourgeois" type, who are integrated into the system are make it run, and who therefore have all the power) will be more dependant than ever on large organizations ... and whatever may be left or wild nature will be reduced to remnants preserved for scientific study.' (1995: 5)

Although the internet was still in its infancy when this manifesto was written, Kaczynski was against its structure where everybody was tied into a system which

¹⁵ The Unabomber was responsible for 16 mail bombings between 1978 and 1995, in which 3 people were killed and 23 injured.

removed human freedom through mass organisation. Whilst the most popular view is that the internet has enhanced almost every aspect of life, it cannot be seen as the open accessible system it was once claimed to be. The structure of the internet, with internet service providers and servers providing access points to information, means that this type of system is 'not only not open, [it] also [elides] hierarchical operations that enable networks to become organized', and thus some nodes within the system will have more power than others (Rossiter 2006: 4). This is reflected in the experience of the end user; as the internet has progressed new technologies have changed the experience from one where everybody could access the information, to one where only certain groups within society can achieve the full experience. Due to this there is now a 'bourgeois class' on the internet who are more informed, having more power and wealth than others.

Throughout history the exclusion of certain groups within a society has been a way of demonstrating power over others in an undesirable way. An extreme example of this was Hitler's Germany, yet in other cultures earlier in the 1900s it was seen as acceptable to exclude certain people, for example due to skin colour, gender, sexual orientation or because of a disability. The repercussions of history are still playing out on the internet, with certain areas inaccessible because of the way that they are constructed. Governments now take the issue of inclusion very seriously however, and there are many regulations in place in the physical world which prevents this from happening. Chapter 3 of this thesis explores this issue in depth with regards to the EU and the USA, looking at how, in the digital arena, it is still possible to exclude certain sectors of society in relation to the issue of accessibility.

With the individual now more empowered and knowledgeable than ever before, it stands to reason that society as a whole should understand the needs of all those within it, however this is not the case. With The fast pace of technological development combined with the dissemination of power, allowing everyone to control their own part of the internet, from a technical point the internet is now less accessible than ever with many not understanding the needs of the disabled. In chapter two this thesis explores how internet communities are campaigning against the larger companies (who still appear to be in control) for a more equal experience online.

Chapter 2: Accessibility and Society

Inclusion within society has developed over many years, as laws and legislation have been introduced not only in Britain but also globally to ensure full equality. With the exception of governmental websites however, such changes have not been acknowledged within the digital environment with the experience for those with a disability still very erratic. This chapter will explore what a disability is, both to the individual and to society, alongside how modern culture has developed to simultaneously exclude and include those with a disability.

When the term disabled is employed, the majority of society responds by conjuring up images of wheelchairs and other physical indicators which would suggest an 'abnormality'. 'Disabled' is defined in the *Oxford English Dictionary* as 'a physical or mental condition that limits a person's movements, senses, or activities' (Oxford Dictionaries 2008). By stating the limitation a person has it places emphasis on them being at fault. This is otherwise known as the 'medical model of disability' and is the best-recognised definition within the western world (Tetchner 1991). Whether a person is defined as disabled or not can be decided only by doctors with the definition determining the level of aid that someone receives. America in 1973 passed Section 504 of the Rehabilitation Act, protecting those with a disability from discrimination. It was at this time that the 'social model for disability' was voiced by activists for equality (Tetchner 1991). They argue that it is not the disability which prevents an individual from fulfilling a specific task or role, but the barriers erected by 'normal' society; the emphasis on fault is shifted from the individual with the disability to society as a whole. Today a disability is no longer considered solely a physical or mental condition. The term has broadened sufficiently enough to include, for example, minorities disadvantaged by the environment in which they live, such as skin colour or sexual orientation.

In many cultures the term disability 'as a recognised category does not exist' (Ingstad & Whyte 1997: 5). This can be seen in the language of the Kenya Maasai where the translation of the term into English refers to a lizard that walks awkwardly; it

describes only physical issues and not mental ones (Talle 1995: 59)¹⁶. In *Disability and Culture* Ingstad and Whyte state that a disability only becomes a problem within more complex societies where labour gains an economic value sold within a competitive market with fixed time scales (1997: 9). To explain this they compare a complex society, where life is centred on financial value and the production of goods, against a simple one, where life is centred on the family and there is a role for everyone regardless of ability. In this situation with no timescale there is not a disability as everyone fulfils their duties. It is only when a society grows that disability becomes an issue. Toni Morrison believes: 'Definitions belong to the definer, not the defined' and this is generally the problem with trying to define what a disability is (1988: 190); often people with a disability are given this definition as a way to categorise them as someone who does not conform to society's opinion of what is 'normal'¹⁷. Tetzchner affirms this by stating that disabled people have always had a place in society, yet it is a place given to them by 'the misconceptions of the leaders of the community and the community itself prescribed for them' (1991).

2.1. The History

To understand why there is now a problem concerning accessibility within the digital arena it is important to understand how attitudes towards people with a disability have changed, particularly towards those with mental or physical problems. Throughout history there are accounts of people with disabilities; it is the way they are viewed that changes drastically. In Roman times disabled people were seen as 'special cases', with blind people supposedly able to forecast future events. However, in Greece and Egypt disabled people were looked upon as undesirables, and in extreme cases were seen to be the embodiment of Evil (Tetzchner 1991). These notions changed with the introduction of Christianity; disabled people were pitied and also actively encouraged to beg in order to allow others to be able to show charity. It could also be argued that this was the first record of habilitation as deaf people were taken in by the church and

¹⁶ The Kenya Maasai are a tribe of people living a nomadic lifestyle using traditions passed down through many generations.

¹⁷ Toni Morrison is an African American female author who explores the experience of black women in a racist and patriarchal society.

taught to speak and learn the catechism in order to allow them entry into heaven¹⁸. By the 1400s disabled people began to be approached as problem subjects, in need of care and also as objects to be studied. Until the mid-to-late 20th Century disabled people remained unfit to be workers participating in industrial production, and were therefore unable to obtain an equal position within society. The bourgeoisie now replaced the church and the emphasis changed to education, albeit within a segregated environment that ‘with exception of deaf children who are dependent on a signing environment, non-segregated special education probably would have given the same results’ (Tetzchner 1991).

Although the attitude of segregation is now evolving to focus on inclusion, within the classroom it is technology that is now impeding the full integration of disabled students. In Farnsworth’s article, *Whiteboard Access*, he looks into the new technology in classrooms and how they are now less accessible than several years ago (2008). Referring to the use of electronic whiteboards and projectors Farnsworth explains that the content, more often than not, is displayed in a format which the visually impaired cannot easily read. Furthermore, such equipment is designed to be used in a darkened room, making it difficult to take notes. Sometimes the technology is created or utilised in such a way that the visually impaired cannot engage with it at all. It appears the attitude shared by many teachers is to simply remove the student from the class, instilling an impression to other students that it is acceptable to segregate people, not only in the classroom but also in the wider context of society if they do not conform to expected normality.

2.2. Regaining a Definition

An issue with defining a disability is, as stated in the introduction to this chapter, the fact that the definition is not made by someone with a disability, it is given to them and they are made to accept by society. In Sarah Triano’s *The Politics of Naming*, she states that a disability is ‘a natural and beautiful part of human diversity that people

¹⁸ A catechism is a summary of the Christian principles.

living with disabilities can take pride in' and as such should not need a medical definition (2003) ¹⁹.

When looking at this argument it is clear that she is a supporter of the social model for disability. Furthermore, such a statement removes the idea that there is a disability at all, instead arguing that disabled people are still human; they are not mass objects to be categorised, they are a part of any society who simply go about activities in a different way to others. She goes on to draw poignant similarities between the issues disabled people face within society and the struggles that other minority groups, such as racial communities, have faced. She believes that it is not a case of using another term to define those with a disability. Instead, as blacks and homosexuals have begun to do, one must work to change the meaning and subsequent thoughts associated with it from one highlighting weakness or limitation, to one where people look beyond the fact that someone has a disability and understand that they can add as much value to society as any other member. She goes on to state, however, that in order for the above hope to be realised at a social or cultural level this change must first be realised by disabled people themselves. This, she concedes, after years of living with an oppressive mindset is a difficult thing to change.

For a shift in the general assumption of what a disabled person is and what they can achieve, it is necessary to see how they are currently treated and to what extent this becomes another barrier to overcome. Tetzchner's text, *Issues in Telecommunication and Disability*, discusses the (Re)habilitation model. The emphasis of the problem is placed with the individual for lacking what are seen to be the correct skills to participate within society; thus the aim is to give them these skills so they may live a more independent lifestyle. This is very similar to the 'medical model of disability' where the 'disabled person [is seen] as an object of study' (Tetzchner 1991)²⁰. This definition has been altered since its introduction in WWII to incorporate environmental issues, however for the individual most of the 'treatment' offered is carried out by those who believe they know what is best, subsequently

¹⁹ Sarah Triano is a disabled woman who has dedicated her life to fighting for the equality of the disabled. She was the co-founder of the National Disabled Students Union in America

²⁰ Habilitation is concerned with adding skills to someone's life to allow them to play a more active role within society whereas rehabilitation is concerned with getting back skills that have been lost, possibly due to an accident.

‘overshadow[ing] the interests and preferences of the individual’ (Tetzchner 1991). As a result, the person with the disability still does not govern their own life; they are merely puppets requiring their strings to be pulled by a master in order to play what is seen to be their correct role within society.

The opposing view to this, stated previously within this chapter, believes that it is society at fault for not accommodating people who are disabled. As is seen in Dick Hebdige’s *Culture*, this opinion could be down to the bourgeois class as he states that these are the people who define what normal is; it is because they govern themselves that these views are very difficult to change as they control what the masses are shown and should believe to be normal (1979). With this in mind it is clear that the people in control (the company directors, members of parliament etc.) need to transform how people with disabilities are seen and treated before a change in mass culture can be achieved.

2.3. The Internet and Society

The internet was initially created in such a way that it was able to be viewed and navigated without a mouse and thus was accessible to as many people as possible. Whilst Assistive Technologies (ATs) were able to keep up with these developments, as the way the internet is used and the content available has changed ATs have fallen behind. Originally web pages were created mainly from images and text which was assistive to accessibility as there were not many different elements and pages had a clearly defined layout (often within a table). This allowed ATs to read the page from top to bottom and most of the time this was accurate enough for it to make sense. Even at this point, if the content was not written correctly a disabled user would miss what is shown in a picture if it did not have alternative text (see appendix 1). As the usage of the internet has grown from a store of information into an entertainment channel with many, if not all websites offering interactive experiences and streaming media, ATs are missing more content because once the page is loaded they do not know about data that is loaded in afterwards. This is often the case with Rich Internet Applications (RIAs), which are becoming more popular due technological advancements allowing for a more engaging experience.

The Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C) has laid out guidelines on how to overcome this problem relating to RIA's, along with the addition of several new attributes which can be added onto elements within the code, these RIAs have the ability to be as accessible as the early web, however it requires more effort and understanding from developers. This means that there must be a shift in thinking (as described earlier in the chapter) from society to acknowledge that the experience of disabled users is just as important as the experience of someone without a disability. This is increasingly evident when talking to a designer new to the industry; they will spend a long time moving an image one or two pixels at a time to give the best possible visual appearance, however when tested for accessibility someone using an AT would not be able to navigate the website at all. It is this attitude, often resulting from a lack of training and/or understanding, which needs to be addressed to bring the issue to the forefront of new technologies. Thus making a website or a new piece of software accessible becomes as important as making it visually appealing. In chapter four this thesis looks at the steps industry is taking to make this easier through the introduction of new industry standards.

Over the course of history it is obvious that the perception of people with a disability has changed. Even though we are now in a better position than ever before to allow people with a disability to lead a fully integrated life as part of society, it is apparent that we are not allowing this to happen. This is mainly due to the fact that those who are in a position to change it (the company directors and owners) are still not willing or do not understand how simple changes can not only help people with a disability but also everyone else. As Triano explains, the changes that are required for someone with a disability to fit in would also help a lot of the population. For example, microwaves that talk would not only benefit those with a visual impairment but many sectors in society, such as the elderly who may have deteriorated vision but are not classed as disabled (2003).

For the full integration of people with disabilities there must also be a shift by physicians, i.e. those who are in charge of defining what is classed as a disability and finding the best way to (re)habilitate them, as currently, even though there is an emphasis on independent living, more often than not they still demonstrate a large

reliance on carers and family for aid. These views are deep rooted within the society that we all live in and it will take an immense cultural shift to correct this. It has already been initiated by governmental leaders who are beginning to recognise the needs of the disabled, yet this has not kept up with the development of technology, as explored in chapter 3.

Chapter 3: Rules on Society

Within a physical society it is now accepted that no section should be excluded or made to feel disadvantaged²¹. Governments within the majority of the developed world have passed laws and legislation making it illegal to discriminate against any part of a society, however at this time there are no explicit rules for the digital world, which especially for the disabled, is a way to gain autonomy within their lives²². In recent years certain groups campaigning for equality within both physical and digital societies have challenged this differentiation.

In 2007 the United Kingdom's (UKs) population size was just under 60 million (National Statistics 2008) of which 8.5 million (Wood 2005) were recognised to have a disability. With over 38 million (63% (Internet World Stats 2007)) having access to the internet, this equates to over 5 million UK internet users having a permanent disability. It is estimated that over 95% of websites on the internet are inaccessible for disabled users, a figure which would now be unacceptable if it were applied to shops on the high street. The UKs Disability Discrimination Act (DDA) was introduced in 1995 to combat discrimination, however it did not implicitly refer to the accessibility of websites until 1999 when a code of practice was released requiring all providers of a service to make 'reasonable adjustments' so as not to discriminate against those with a disability. The ambiguity surrounding this statement has meant that in the UK there have been no cases taken to court and as a result I believe this has meant that the needs of the disabled have not been publicised as they may otherwise have been.

²¹ When referring to a physical society I am referring to our tangible surroundings. This is an important differentiation to make as many societies are now forming on the internet and are governed by a separate set of rules.

²² The digital society in this case refers to the interaction and communications which take place on the internet, the idea of a digital community has only been created within the last decade as technology has provided the ability to faster communications and services.

3.1 A Landmark Case

The United States of America (USA) has very similar legislation to the UK and this was recently tested with a very prominent case brought against Target, by the National Federation of the Blind (NFB)²³. This case arose from the fact that the defendant provided a means to purchase products and services digitally on a website which was not accessible to those relying on ATs. The claim stated that Target ‘excludes the blind from full and equal participation in the growing Internet economy that is increasingly a fundamental part of the common market place and daily life’ citing that the website ‘contain[ed] thousands of access barriers that [made] it difficult if not impossible for blind customers to use the website’ (Heller 2007). Target denied all the claims stating that the relevant laws ‘cover access to physical spaces only’, a claim that could easily be made by a UK company with the current ambiguity in wording (Patel 2007). Settling out of court Target admitted no liability, however, they did agree to work closely with the NFB to ensure their website was accessible and also set up a fund of \$6 million to cover all claims for damages. Despite being settled out of court it is the first major case to use current laws on accessibility within physical society to combat the issues within the digital world.

In the case stated above the NFB claimed that there were a set of accepted accessibility standards defined by the WAI, however Target denied this. In Europe these standards have been accepted since 25 March 2002, when in the eEurope Action Plan it states that they have become the ‘de facto standard used worldwide for the creation of accessible websites’ (EIS²⁴). In 2007 a scheme was introduced called i2010, which aimed to ‘[ensure] that technology is not part of the barrier to inclusion’ and last year a campaign called ‘e-Inclusion: Be Part of It!’ aimed to raise awareness of current efforts to gain a more equal digital society (EIS²³). Another major part of this initiative is to ensure that companies are made aware of their responsibility to equality, as even though dissipated to a degree it is still these large companies which hold the power to make the digital society equally, if not more accessible than the

²³ Target is one of the most popular supermarket chains in the USA with ‘more than 1,600 stores in 47 states’ (Target 2009).

²⁴ http://ec.europa.eu/information_society/activities/einclusion/bepartofit/index_en.htm

physical one. To do this they have introduced 'Design for All' (DfA) which has backed many schemes and encouraged 3 main areas of development; the exchange of best practices between companies through a dedicated website, standardisation, and finally, further research into how to make a more accessible community. Part of this research was into the development of ATs as currently 'there is a great deal of fragmentation in the ATs market place' due to the fact that they all operate in different ways so a user cannot go from one system to another without re-learning the skills needed to operate it efficiently (EIS²⁵).

3.2 The Problem with RIAs

As has been discussed previously in chapter 2.3, the major problem with RIAs relates to the way that they load new data into a web page or application; the two main methods are currently JavaScript (JS) and Flash. These two technologies are responsible above any other for creating the rich internet experiences which are now available to the 'average user'.

JS was developed in the relative early stages of the internet when designers and developers wanted a way to interact with the web browser and alter attributes on the page without having to reload it. Originally intended for visual effects, more functionality has been written in over time with accessibility being considered at a later date. With the continual progression of technology accessibility always appears one step behind. However with the WAI this has now started to be addressed and the functionality is now there to make even the most complex JS applications accessible. This is done by setting new attributes on the elements that are to be updated via JS, which then enables the ATs to monitor these elements for a change and alert the user according to the attribute set. These new attributes are now accepted in all the major browsers as a standard with the only barriers being the awareness of these attributes within the industry.

The Flash platform is also used widely by developers of RIAs as it removes problems created by a browsers individual interpretation of code as it runs independently of it.

²⁵

http://ec.europa.eu/information_society/activities/einclusion/policy/accessibility/assist_tech/index_en.htm

Due to this Flash it is now one of the most inaccessible parts of the internet. Designed for animations the role of Flash, with 'over 80 percent of online videos' viewed using it, has grown and in turn changed the way the web as a whole is used (Adobe 2009). With this change in use from simple animations to RIAs the need for greater accessibility has increased which is one of the major drawbacks of using such a technology; it is often proprietary. This is a difficulty JS no longer has as when it was evident that it was to become a ubiquitous technology, Netscape handed it over to the international body Ecma International, a leader in standardisation within the digital arena. Adobe claim to have in place the ability for Flash to be accessible to ATs, however this is only available on one operating system and the user must use a specific browser for the features to work.

As the internet progresses and developers demand more from it the problems with accessibility will increase. In most cases however, there are already solutions in place to make even the most complex RIAs available to everyone. With proprietary software such as the Flash platform the responsibility is down to the company (Adobe) to ensure that there are ways for developers to add these accessibility features to their RIAs. The companies that are developing software for the internet are the people who have the power to change how accessibility is seen on the internet and make sure it is one of the most prominent features of the software they develop. As concerns about accessibility have been brought to the foreground within the physical society the same concerns have been raised about the digital one and it is the open source projects which are leading the way in terms of both development of the internet and accessibility in general. This is demonstrated by Firefox, an open source web browser, which has some of the best accessibility features available. Due to the community driven development a lot of additional features are now available for the disabled user such as Firevox²⁶. It is this type of community development that will make the companies creating inaccessible software rethink how they approach such issues because if they do not, someone within the development community will and therefore reduce the market share that the company has on the internet.

²⁶ Firevox is a plug-in which can be downloaded and installed for free in the Firefox browser. This is a free version of a screen reader which vocalises the text on screen.

Chapter 4: The Future of Inclusion

The power of the web is in its universality. Access by everyone regardless of disability is an essential aspect. (Berners-Lee 2009)

When Berners-Lee created the World Wide Web in 1994 this was the vision he had for it. In 2004, 10 years after the mass release of the web, the Disability Rights Commission (DRC) tested 1000 websites and concluded that 81% did not meet the minimum accessibility guidelines set out by the WAI, with 19% of those tested not complying ‘even with the lowest priority Checkpoints for accessibility’ (DRC 2004: 9). When the report was written it had been the law for several years to provide an accessible experience for all users, however this was not done to name and shame those companies who did not comply, but was merely an investigation to detail the uptake on the new law. This chapter will explore the controversy surrounding this decision and the repercussions on the state of accessibility today.

4.1 Accessibility Efforts on the Web

Since 1994 there have been efforts to increase accessibility on the web. However these have always lagged behind the developments of the internet itself. One of the main efforts has been to introduce Web Content Accessibility Guidelines (WCAGs)²⁷. The second edition of WCAGs were released in December 2009 and were stated ‘to be easier to use and understand’ (Henry 2008) This is not the case however; due to the confusing language used, a problem that this document set out to correct from the first version, it is likely that these guidelines will not be followed. One area of improvement is the provision of real-world scenarios making it easier for the designer to understand why these guidelines are in place. The new WCAGs have been developed over the past two years and are in response to changes in the use of the web however Moss states in his article on the new guidelines, ‘web developers still implement ... out-dated guidelines because they don't know otherwise’ (2006). The attitude within business that, ‘as long as it complies with a set of guidelines then we

²⁷ The accessibility guidelines aimed to ensure the content of the web was accessible to everyone.

are doing our best', is a very common one and although a good starting point, it is not a substitute for understanding the reasoning behind them.

This raises the question of what can be done within a company to improve both the products offered and the understanding internally of accessibility to provide a disabled user with an experience similar to that of a 'normal' one. In the book *Web Accessibility* (2006) this is addressed by the presence of an internal Accessibility Organisation (AO). The authors stress the importance that this group is not made up of people appointed solely to improve accessibility within the company, rather to have a representative of each major team within the company who can then pass the decisions and knowledge down to everybody in a way that someone from outside the team could not. One of the key points that the author makes is that the AO must have the backing of senior members of staff who have the power to ensure that the suggestions from the AO are implemented. The main roles of an AO are to raise awareness of the problems faced by disabled users and to provide training on how these problems can be resolved. It is only when these roles are achieved that employees will understand the needs of the disabled and implement new measures, the grounding of which must come from industry wide standards. On the internet this is being championed by both the World Wide Web Consortium (W3C) in the form of the WAI and the Web Standards Project (WaSP), the former of which is responsible for defining web standards whilst the latter 'fights for standards that reduce the cost and complexity of development while increasing the accessibility and long-term viability of any site published on the Web' (WaSP 2009). WaSP works with providers of web based solutions to raise the awareness of web standards and are responsible for creating the acid test, which runs in a browser to test compatibility with said standards. This test has now become an standard way that browser manufacturers benchmark themselves against their rivals. The results of this test on the three most popular browsers are show in appendix 4.1²⁸. As can be seen none of these browsers pass the test successfully however some more so than others. As Gunther states in his article, *Acid3 Receptions and Misconceptions and Do We Have a Winner*:

Testing is really important. Without tests that check how well a certain

²⁸ For this test I ensured that all browsers were up-to-date with all plug-ins and add-ons turned off.

browser follows standards, i.e. applies mark up and displays the result correctly, we can never guarantee an open, fully interoperable web. (2008)

4.2 The Future of Standards

One way in which the companies behind the main browsers (excluding Microsoft) are increasing accessibility is by proposing a new set of standards called HTML 5. This would build on the current set of standards, greatly improving the accessibility of websites by allowing ATs to understand a web page more²⁹. Due to the fact that these standards have been suggested by the people behind the browsers there is a good chance they will be implemented much quicker than others. Despite this, Microsoft, the company behind Internet Explorer which fared the worst in the acid test, have not yet given their support to these new standards. As this is the operating system and browser which still has the largest market share it is imperative to have their support and it is seen by many as a 'clean slate' for Internet Explorer if they adopt the new standards (Shah 2007).

Web standards are the most obvious way that the barriers presented to disabled users are being removed and in turn creating a more accessible web. With accessibility to such vast amounts of information becoming available to more people the position of power is broken down. Defining these new standards however is only the first step to creating a more accessible experience. The next, greater step is educating the designers and convincing companies to implement them. As has been seen in this chapter there are many companies and service providers which do not currently provide accessible experiences who could (under current law within the UK and USA) be prosecuted, however due to a case never going to court in either country companies are still not taking these matters seriously³⁰. It is only when one of the offending service providers is prosecuted and affected financially that the rest of the business world will realise that it is better from both a financial and accessible point that the requested features are in place as part of the initial development structure. This will not only help within the online sector but will also affect all digital media

²⁹ HTML 5 would introduce new coding tags such as 'header', 'footer' and 'nav'.

³⁰ the closest being the case against Target described in chapter three.

such as set-top boxes. Appendix 4 shows the preferred way that a website should be built. Using these layers ensures that the content is accessible by everyone, which is the most important factor. The key to implementing these development methods and standards is the education of designers who are often not aware of the simple but vital steps that can improve the experience of the disabled and this must come with the support of employers to ensure that the theory is put into practice. This is all part of the social factory that is taking place, creating a new type of worker where the job is not confined to a single place of work as is seen in chapter one. Speaking to many designers they will not define their work as a job, it is a way of life which does not stop when they leave the place of work, they are continually engaged within a global community that enables them to develop and share their skills. It is within this community that accessibility awareness must be raised and given the attention that it needs. This will only be done as people understand the issues and the solutions available to tackle them.

Conclusion

The thesis set out to explore accessibility, the issues surrounding the standards already in place and the factors within history, which have brought us to the current issues surrounding (in)accessibility. When looking at these problems in a broader context it is clear that those faced by the digital community are also faced in physical society. The difference between the digital and physical worlds, however, is anonymity. If a disabled person can not get into a shop there is someone there to complain to and the chances are that provisions will be made very quickly to allow disabled people access. However, if the same problem occurs online then more often than not the only choice for those affected is to send an email to the company, not knowing if they will even receive it. It is because of this that even though under the same legislation as physical shops, the virtual world have been able to ignore the needs of disabled users which make up a large proportion of all internet users; with many claiming that it is a vital part of their independence.

Throughout the last century as technology has improved there has been a shift in working environments and consequently in communities and cultures. From Fordism, where the worker was seen to be part of the machine doing a single task and where innovation and free thinking were suppressed by those with power, through Toyotism to the Social Factory. The latter is built on the idea that work is not confined to a single place or building, rather it is incorporated within our social habits and to an extent only viable with the internet due to the connections which it allows people to make with a global audience. It is the connectivity that was at the heart of the internet in its early days. Pioneered by Berners-Lee the web was his vision of a global information repository, accessible by all, regardless of a person's ability. In this way the web was designed so one could navigate without the need for a mouse aiding those with impaired motor skills. As the internet has grown from the domain for 'geeks' to an integral part of everyday life for everyone the purpose of the internet has changed and continues to change as peoples needs develop. The notion of being connected to a global audience is one that has developed more rapidly than any other. With social networking websites nurturing this psychological need, the web has become more than a place to gain knowledge in the tradition sense of acquiring or

improving skills, it is now a place to gain social knowledge of everything from what has happened on the other side of the world to what the person who lives next to you got up to the night before. The general perception is that this shift is a positive one, however it has taken place at such a rapid pace many developers and designers have created applications for themselves and as such those with a disability are being excluded and are unable to have the same input into the virtual community as everybody else, in much the same way that the factory worker in a Fordist factory was unable to suggest ways of improvement at the turn of the 20th century. As I have researched this thesis I have come to the conclusion that this should not and does not need to be the case, not only from a legal point, but also from an ethical point.

There are currently many groups which are campaigning for a more accessible internet, a couple of which have been highlighted in chapter 4. However, they all identify one simple aim - that of greater and sufficient education. This applies to everybody who works in the digital sector, as the problem of accessibility is not just a issue for websites; it is also a problem within classrooms and in the home, in the form of digital white-boards and set-top boxes respectively. The issue is that service providers are either not aware of their legal responsibility to provide an accessible experience to every user or they are choosing not to comply as they feel that there is not enough of a financial reward to implement the features needed. As has been seen this attitude is down to the fact that nobody has been taken to court and until such a time as this happens I do not believe that companies will take this matter as seriously as they should be.



Due to the attitude of those in power I am proposing a 5 year plan which will create a fully accessible web. This is both a bottom up and top down approach simultaneously and relies on the need for one set of standards, as it is only at this point that ATs can operate to their full potential. The first stage is to get all major browsers to agree to support one set of standards fully. As has been seen with the acid test all the major browsers support current standards to various degrees and I believe that this is because they were not consulted, as they should have been. With the introduction of HTML 5, which has been proposed by two of the main browsers and supported by others, it opens the door to a single set and 5 years allows for small amendments to be made and old proprietary standards to be phased out. This adoption by all browsers

will inherently create a change in those who create content for the web as they will no longer have to change code to make it work in all browsers. This in itself will be enough for designers to use these new standards and for companies to invest in training their employees. Another large part of this plan would be to hand Flash over to an international body in a similar way that JS was in the 1990's. This will enable both Adobe and Microsoft to contribute to the development and create a single way to provide streaming and interactive media to the internet³¹. This will also allow the development of accessibility within Flash to expand to allowing all users access.

Of course the real winner of this plan is the user, disabled or not. If there is a set of standards each website adheres to, each will function in a similar way meaning the user does not have to familiarise themselves with each new website they visit as similar items will be placed in similar places. This does not mean that the visual design of websites will become monotonous but it will mean that ATs will be able to function more efficiently. The best example of this is csszengarden.com, a project that aims to show the power of Cascading Style Sheets (CSS). On the website there are many different designs however they all use the same code, and this is the way that new standards could be used without compromising visual appeal. The new web that is created out of these recommendations will be as accessible, if not more so than the original, allowing all to contribute and gain knowledge...the way it should be now.

³¹ Adobe is the company who now owns Flash whilst Microsoft has a rival offering called Silverlight which offers much of the same functionality.

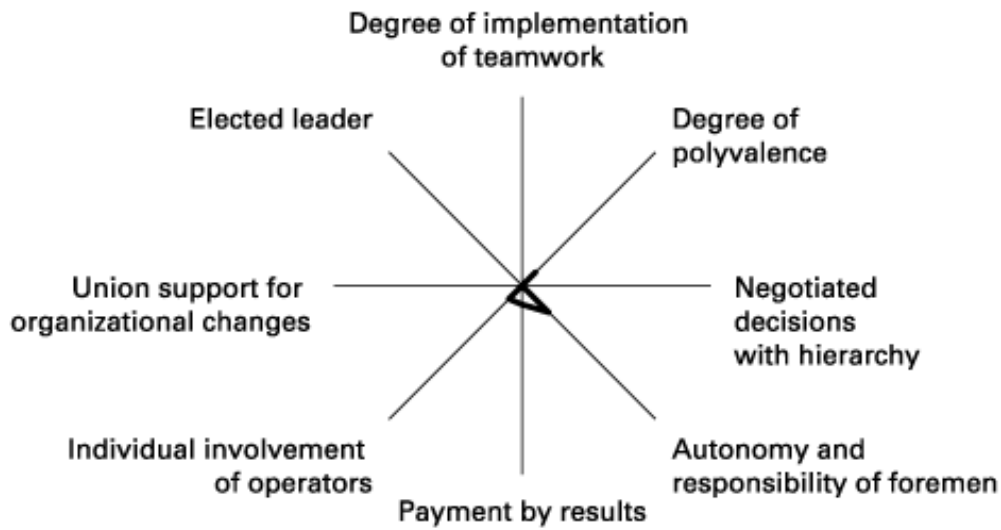
Appendix 1: The importance of current accessibility measures

Day	Mon	Tues	Wed	Thur	Fri
Outlook					
High (°C)	25°	20°	15°	10°	5°
Low (°C)	15°	10°	5°	0°	-5°

- ↑Above: how a person without a visual impairment would see the web page.
- ↓Below: A person with a visual impairment using a screen reader would hear the words where the image should be, making the website as usable as if the person could see the pictures apart from where it has been neglected to be put in (where it says “IMAGE”).

Day	Mon	Tues	Wed	Thur	Fri
Outlook	sunny	partly cloudy	IMAGE	rain	snow
High (°C)	25°	20°	15°	10°	5°
Low (°C)	15°	10°	5°	0°	-5°

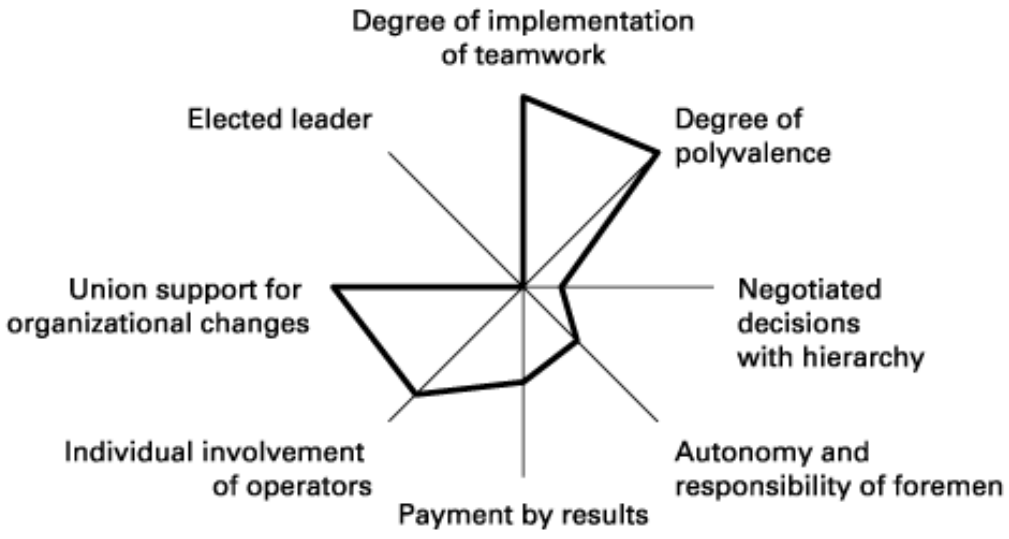
2 The role of the individual within the factory



Above: Fordism

Below: Toyotism

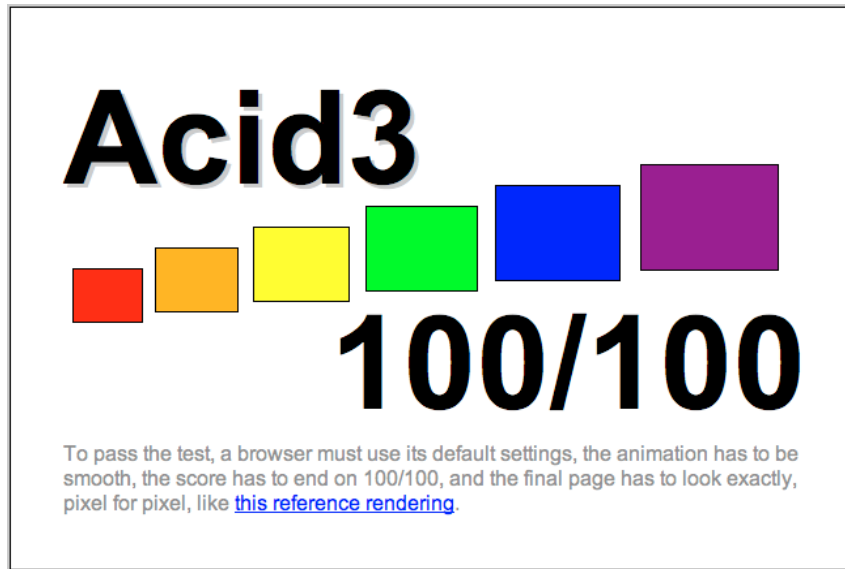
Taken from <http://www.ilo.org/public/english/dialogue/sector/techmeet/tmte2000/tmter7.htm>



Appendix 3: Standards compliance in browsers

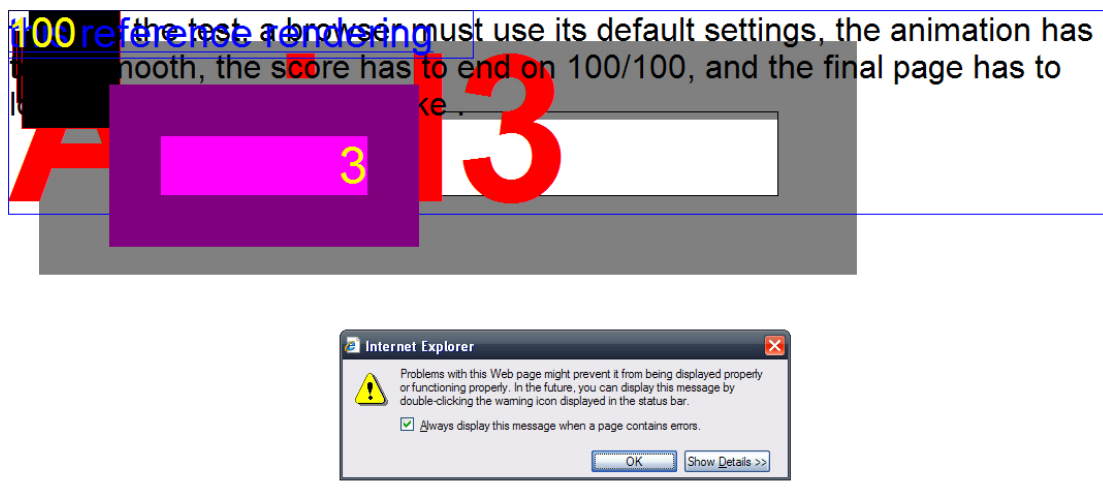
3.1 The reference image

If a browser completes the test without fault this is what should be seen.

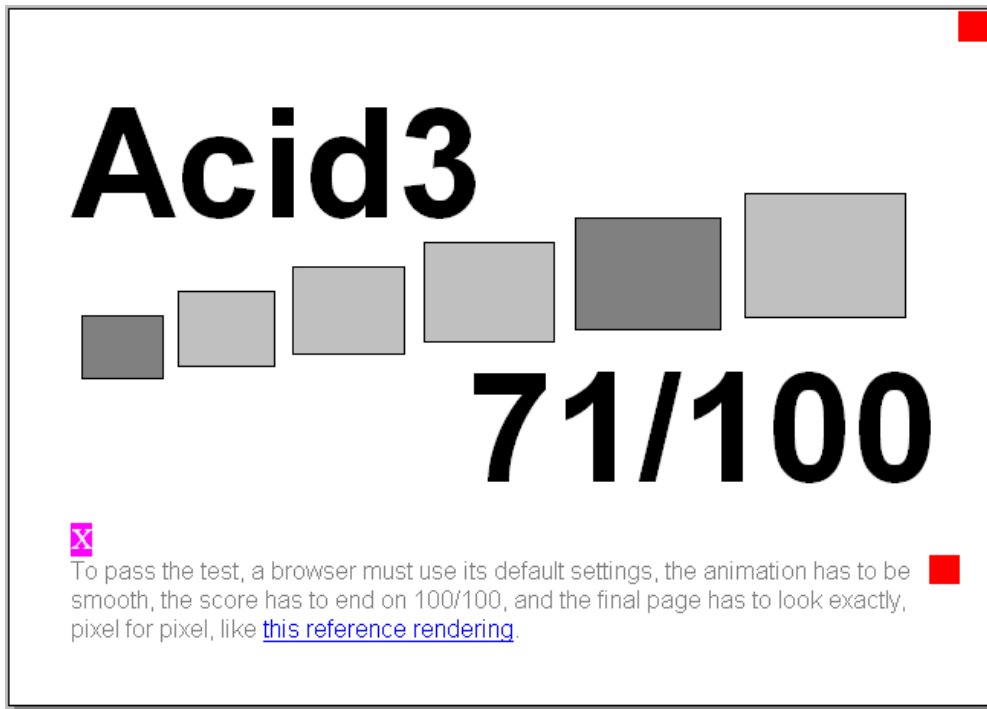


3.2 Internet Explorer 7

As can be seen this produced an error. After clicking 'OK' it went up to 12.



3.3 Firefox 3



Acid3

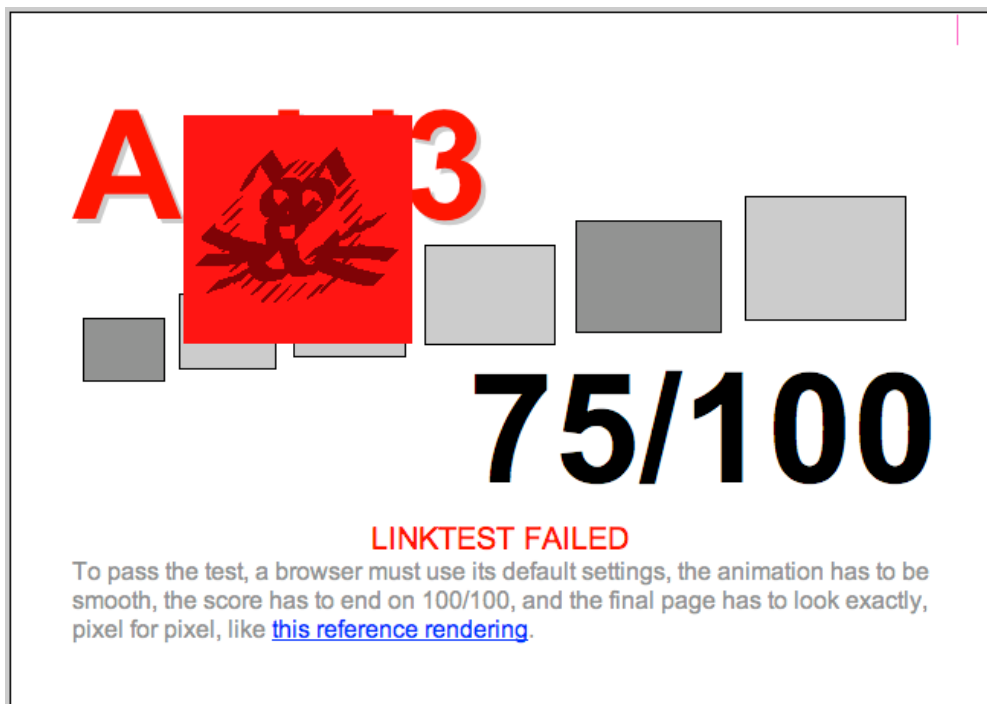
71/100

X

To pass the test, a browser must use its default settings, the animation has to be smooth, the score has to end on 100/100, and the final page has to look exactly, pixel for pixel, like [this reference rendering](#).

The image shows the Acid3 test interface for Firefox 3. It features the title 'Acid3' in large black font. Below it is a progress bar consisting of six gray squares of increasing size. The score '71/100' is displayed in large black font. A pink 'X' icon is visible in the bottom left corner. A red square is in the top right corner. Below the progress bar, there is a paragraph of text explaining the test requirements and a link to a reference rendering.

3.4 Safari 3



A 3

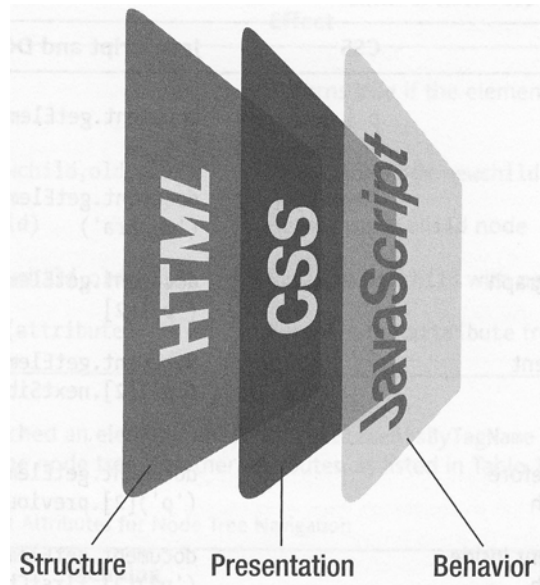
75/100

LINKTEST FAILED

To pass the test, a browser must use its default settings, the animation has to be smooth, the score has to end on 100/100, and the final page has to look exactly, pixel for pixel, like [this reference rendering](#).

The image shows the Acid3 test interface for Safari 3. It features the title 'A 3' in large red font. Below it is a progress bar consisting of six gray squares of increasing size. The score '75/100' is displayed in large black font. A red square with a black skull and crossbones icon is overlaid on the progress bar. A pink vertical line is in the top right corner. Below the progress bar, there is a paragraph of text explaining the test requirements and a link to a reference rendering, with the text 'LINKTEST FAILED' in red above it.

Appendix 4: The layers of a website



(Thatcher 2006: 305)

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