Digital Accessibility

There is a tendency to assume that Digital Accessibility means Web Accessibility. That is already a massive area of content offering enablement and cost effectiveness with the potential for inclusivity, however, the same underlying technologies are transmuting into other forms of digital media, whilst ongoing device and channel convergence are changing how that content is interacted with. This makes an all-encompassing and forward thinking view of Digital Accessibility essential.

Digital technology

Digital technology is disruptive technology, which means it moves quickly and whilst new opportunities emerge from it, it also undermines incumbent industries. It is not a single technology.

Rapid obsolescence is a feature of Knowledge Economies, which is what the Digital Economy is; and what happened 25 to 30 years ago has already become irrelevant, or is about to.

What this means is that the first phase of digital technology now represents incumbent industries being undermined by innovation in different digital technology.

A characteristic of how digital technologies have evolved is that they move processes, transactions and products from the physical to the virtual environment.

Current and emerging digital technologies

The following briefly summarises current and emerging digital technologies in relation to accessibility with comments and links to further information:

The Web

1. The Internet
   - The World Wide Web, or simply the Web, is a means of accessing content via the Internet. This delivers information, services, transactions, consumable content and entertainment, has global reach and is on an enormous scale.
   - Detailed standards and guidance for accessibility are already in place and include:
     - [Web Accessibility Initiative](#)
     - [WCAG 2.0](#) (ISO 40500)
     - [WAI-ARIA 1.0](#)
     - [WCAG2ICT](#)
     - The WAI is also looking at Mobile Accessibility and Cognitive Accessibility.
     - [UAAG2](#)
     - [BS 8878](#)
     - Section 508 in the USA
   - Social media is an aspect of the Internet aimed at connecting groups and common interests, or publishing to them, or interacting with them.
   - Most of the Web is made with these mark-up languages HTML, XML, XHTML, [HTML5](#), XHTML5, [CSS2 and CSS3](#).

- These have the potential to deliver high levels of accessibility if correctly used; the problem is they are often not. This is because:
    - WYSIWYG software is used by Digitally Enabled Skillsets to create web content, more often than high level Digital Skills are involved in workflows (see below). This means the practitioners are not always conversant with what they need to do and there may be limitations to what their tools can deliver automatically;
    - Many websites are delivered 'on the fly' from dynamic systems attached to databases that may not have been designed or configured to output accessible content. These are known as Content Management Systems (CMS), some of which are integrated with other types of software system or programming.
    - Content Management Systems have also become available as free or low cost solutions for individuals and small businesses, making an online presence readily available to non-expert users. Some of these do have accessibility features, although the value of implementing these may not always be understood.
    - Website or content owners do not always know, or care, about accessibility. Marketing departments with specific commercial objectives may not see it as a priority for example.
    - The legal obligation is on the owner of a website, not the 'digital professionals' that build it. If neither party has much technical understanding of accessibility then realistically there is nowhere that the scenario can go.
- Programming languages are also used, JavaScript being common, to make things happen dynamically. This introduces other accessibility issues.

Apps

2. Apps
    - These are stand-alone programs that contain or do something and are usually associated with mobile devices and platforms. They may connect to the Internet as part of what they do; however, they exist and operate locally on a tablet device, smartphone or laptop for example.
    - Some, though not all Apps use digital technology that is related to web technology.
    - Apps are not a major focus for accessibility concerns at present. They are potentially problematic though because:
        - Some use proprietary code, or are exclusive to particular platforms.
        - Like websites they could just as easily be made by a teenager in their bedroom as by a professional development team—and are likely to get published and find a following in the marketplace if they work for a majority of users.
        - For some industries under threat from digital disruptive technologies, the Publishing Sector being a significant example, Apps are attractive because they offer the possibility of a less dramatic change in product concept, which

seems less challenging and requires less engagement with new digital technologies, practices, workflows and skillsets.

Publishing

3. Digital Publishing and Education: eBooks and eTextbooks (ePUB3 and EDUPUB). This is a major development, has been evolving for around 25 years and is arriving at maturity. It threatens to undermine much of the incumbent Publishing Industry and Education Sector, particularly in Higher and Further Education. Many in Publishing and Education remain complacent because their mind-sets do not comprehend what is about to hit them:

   - The digital technology used in eBooks is very closely related to web technologies, therefore is capable of the same things. This means that detailed standards for accessibility were already in place to inform its development.

   - So far eBooks have been predominantly text-based, which disguises their market penetration. In the UK 40% of the fiction market has gone digital in just a few years. Because other genres have been less affected they are assumed to be safe from digital competition. In fact ePUB3, which allows interactive content and media enrichment, delivers a product that print cannot possibly compete with and will be arriving on the market as a more sophisticated and mainstream option from 2015 onwards. It is already here (ePUB3). The market could develop rapidly as compatible eReading software becomes universally available. There are sub-set possibilities within the ePUB3 specifications that allow for document types as diverse as an Act of Parliament or a Graphic Novel.

   - EDUPUB is a specific profile of ePUB3 that is intended for eTextbooks. It is very detailed and well thought through and has the potential to deliver high quality learning resources and to enable self-directed learning, with global reach. It would be possible to deliver an entire course of study from EDUPUB documents, very cost effectively for the student, whilst ensuring an equal standard of Learning and Teaching delivery across the education audience.

   - The good news is that because the technology involved in ePUB3 and EDUPUB is derived from existing web technology accessibility is already accounted for by:
     - The EPUB Accessibility Guidelines
     - A comprehensive selection of semantic additions to the principle mark-up language, XHTML5, using attributes to describe document structure and content roles, or functionality, in relevant detail.
     - The incorporation of accessibility guidelines for embedded media content, for example closed captions for video (see also under section 1 above).
     - The fact that an ePUB3 eBook may contain different formats of itself and multi-media alternatives, making it possible to present, or be accessed, in different ways. Any well-made ePUB3 eBook could also be an audio book, or be read aloud by assistive technology.
     - Most eReading software lets the user's preferences override the eBook's intended presentation, meaning for example that a dyslexic could view it in a cursive font on a tinted background, or a visually impaired user could switch it to greatly enlarged text in white on a black background.

- The [EPUBTest Testsuite](#) includes test files for assessing the accessibility of eReading software as one of the measures of its compliance with and implementation of the ePUB3 specification. A basic assumption is made that ePUB3 content should be readable in a number of accessibility scenarios.

- The bad news is that the incumbent Publishing Industry and Education Sector are not up to speed with this and are in denial about what it involves, seeking to adapt existing inappropriate workflows and business models and the wrong skillsets to deliver a digital product, which is often a travesty of what it should be.

  - There is a significance here for the UK Digital Economy because Digital-first workflows and Digital2Print deliverables, derived directly from eBooks (or the same single source), will wipe out the print focused Publishing Industry by bypassing conventional production methods; and the Education Sector will be overwhelmed by MOOCs and well produced EDUBPUB resources that it cannot compete with on value.

- It is also important to point out that ePUB is not the only eBook format. The mobi and KF8 file formats are used too though are less capable. These are read by Amazon's Kindle devices. Apple has an ibooks file type, however, supports the ePUB standard as well. Dedicated e-Ink eReaders have a strong market presence for reading text-centred content in mobi or ePUB2 format, however, cannot deliver the equivalent experience of ePUB3 presented on tablets, laptops, desktops and smartphones. The ePUB3 specification is an open standard created by the International Digital Publishing Forum (IDPF) and is free to use. The Readium Foundation has been developing eReading software to accelerate the adoption of ePUB3 and an alternative DRM (Digital Rights Management) solution has been evolving for it also. Apart from its technical advantages, which make high production values and interactivity possible, an obvious attraction of ePUB3 is that it offers a non-proprietary, cross-platform and device independent publishing medium.

Other areas of interest

4. Software: This deserves a mention because it represents another facet of digital accessibility, which involves doing things or the ability to create something, rather than receiving, interacting with, or consuming, digital content. Accessible software allows the disabled and impaired to fully participate and contribute to the digital environment, which is of course also about full inclusivity and employability.

5. Computer and online games: There are obvious practical difficulties here, however, the same argument applies as to software; that Digital Accessibility is about full participation, not just about being on the receiving end of digital services.

6. Devices (meaning smartphones, tablets, laptops, desktops, TV, or any physical equipment through which digital content is made available to a user). Most digital devices now have some accessibility features in-built—and it is certainly conceivable that as this continues to improve, if combined with the application of best practice to content creation so that it is inherently accessible, the need for separate assistive technology may decline for certain segments of society, the aged perhaps before the onset of a very specific disability. This is something to be aware of.

7. The [Semantic Web](#) or Internet of Things: A simple concept that may be more complex to realise and which may mean different things in alternative visions of its future. Essentially this is about joining up and relating things through the interconnection of data.

8. FinTech: The Financial Services Sector is undergoing change as disruptive digital technologies (known as FinTech) circle its established practices and markets. Obvious examples are NFC in payment technology (Near Field Communication) and [Enterprise Intelligence Software](#) for Research, Analysis and Compliance, or the crowdsourcing of business capital. Accessibility of the evolving services and solutions offered by FinTech will become a consideration, though so too may be the spin-off potential of them. NFC for example could enable or extend accessibility in other ways.

9. Travel, Marketing and Healthcare are also areas currently being transformed by innovative digital technology; and by the fundamental shift from a supply led to a market led economy that digital technologies have enabled. It follows that accessibility issues may arise here as well, as they will in any activity that is absorbed into the Digital Economy.

Accessibility and Inclusivity in relation to the Digital Economy

Accessibility, which affects people with disabilities and impairments, is a sub-set of Inclusivity, which affects everybody, which is sub-set of Usability, which is actually about user-focus, customer-focus, or citizen focus, depending on the perspective of the participants.

Digital engagement

Digital society has different levels of engagement.

1. **Digitally Literate:** Those people who are able to engage with and make use of digital products, solutions and services, on a variety of digital devices, as part of their everyday lives, to communicate, participate, make transactions, or receive entertainment.
   1.1. A substantial part of the UK population would appear to be Digitally Literate. This is probably helped by the fact that a lot of software and devices are designed to be intuitive and user-neutral and entry levels for access are low.
   1.2. The Digitally Literate population are users or consumers of digital things, or employ them to facilitate their lifestyles—and the disabled, impared and ageing are among them. In a Digital Economy the Digitally Literate are the marketplace and incorporate the digital workforce, which is a combination of the Digitally Enabled and the Digitally Skilled.
2. **Digitally Enabled Skillsets:** A distinction needs to be made between a Digitally Enabled Skillset and Digital Skills. Those with Digitally Enabled Skillsets are able to do something because a digital technology makes that possible, or magnifies their ability and capacity to do it.
   2.1. A substantial part of the workforce employed in service industries—and especially those participating in the Digital and Knowledge Economy are Digitally Enabled in their professional activities.
   2.2. Digitally Enabled Skillsets include all users of software for a work related purpose. A significant point to note, however, is that the ability to use a software solution is not the same as knowing what it actually does, or how it does it. This is important because many of those working in the Digital Industries and the Digital and Knowledge Economy are simply Digitally Enabled, which means that their skillset is the ability to use software programs in varying degrees of proficiency—probably a set of WYSIWYG tools (What You See Is What

You Get); and as contributors to and participants in the Digital and Knowledge Economy, this is not the same as being Digitally Skilled.

2.3. It is in the interests of the UK to raise the competency levels of its Digitally Enabled Skillsets to shift their abilities towards real Digital Skills.

2.4. Digitally Enabled Skillsets are vulnerable to rapid obsolescence, which is a feature of Digital and Knowledge Economies cause by the disruptive technologies that they generate.

3. **Digital Skills:** This involves levels of understanding and experience that allow the creation and deployment of digital technologies with insight and flair, innovatively and with detailed application. There may not always be a clear separation between the Digitally Enabled and the Digitally Skilled and there are varying positions between the extremes.

3.1. The Digitally Skilled includes programmers and those digital developers and designers able to work directly with mark-up and code.

3.2. It also includes those that build and maintain the Digital infrastructure, although that is a different set of skills.

3.3. Those with Digital Skills are far fewer in number than those with Digitally Enabled Skillsets and the gifted among them are fewer still.

3.4. This is an issue for the UK because the Digitally Skilled make, drive and fix the Digital environment and without enough of them, a leading Digital Economy with global reach is not sustainable.

Delivering Digital Accessibility

1. **Digital Accessibility** means both access to digital content and services and access to the use of digital technology as a means of employment, so although the focus is typically on access to content, it should also be on access to opportunity.

1.1. The Digitally Skilled can solve accessibility issues relatively easily simply by applying best practice in what they do, or they can make better software that delivers accessible results more easily.

1.2. Those with Digitally Enabled Skillsets are less able to solve accessibility problems because they don't know enough about the technology they are using and may in reality have quite shallow Digital skillsets, limited to knowing what boxes to tick and buttons to press when using specific software.

1.3. There is no reason why the disable may not also be among the Digitally Skilled. For example dyslexics make good programmers.

So, what is required to resolve Digital Accessibility and raise inclusivity is the same as what is needed to build and sustain the UK's Digital and Knowledge Economy, which is a greater emphasis on real Digital Skills.

Disclaimer

This document on Digital Accessibility is for general information and guidance purposes only and is intended simply as an introduction to and overview of the subject area—and of surrounding and interrelated influences.

Its commentary represents well-reasoned professional opinion based on the author's knowledge expertise and an informed interpretation of the available resources at the time of writing, some of

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