



# Inclusive New Media Design: including people with intellectual disabilities in the web

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## Summary

In a context in which there is growing awareness of the need for the WWW to be accessible to all of the world's citizens, why do people with intellectual disabilities remain excluded? Why have web designers been so slow to take steps to include this particular community of disabled web users? What can be done to make the web inclusive for people with intellectual disabilities? Who is going to make this happen? How can research help? This report describes innovative research undertaken on Inclusive New Media Design, the first project of its kind to address these questions.

Inclusive New Media Design (INMD) aimed to contribute to the social inclusion of people with intellectual disabilities (ID) in the WWW, by identifying the best ways of encouraging web designers to build websites which are accessible to people with ID. This group has historically been marginal to web accessibility efforts. INMD aimed to examine the effectiveness of the WAI's Web Content Accessibility Guidelines (WCAG) as a means of achieving such inclusion, and to identify the factors that affect the take up of the accessibility ethos in the work of web designers and developers.

On INMD we ran nine ID accessibility training workshops with 28 web designers and developers; three more participated in interviews with us, but were unable to attend the workshops due to other commitments. Participants were all experienced web professionals, with a range of accessibility experience. People with ID participated in four of the nine workshops as user testers. We also gathered data about the work and accessibility practices of web professionals through feedback forms, interviews and observation.

As a result of engaging in INMD, all participants took action in relation to ID inclusion, passed on what they had learnt to others, or planned future action. The kinds of action taken include:

- adapting use of imagery to support text;
- using large fonts and simple text;
- re-checking previous work for ID accessibility;
- passing on information at work, or through blogs.

Thus INMD succeeded in contributing to the inclusion of people with ID in the WWW, but mainly for people at the mild end of the ID spectrum. Participants recognized that adaptations for this audience – such as simple text, nice graphics, simple choices and a clear message – could widen and benefit all audiences. In contrast, accessibility measures for people with severe or profound ID may be intrusive to non-disabled audiences. Consequently, participants acknowledged that it would be less likely that they would attend to these audiences' needs in their future work.

Reception of existing WCAG guidelines was mixed, as participants acknowledged both their value and their limitations. They were widely seen to be complex to understand and implement. It was feared that they may lead to a tick-box culture, and not to genuine accessibility. But despite the limitations of WCAG, most INMD participants displayed a passionate commitment to an open and accessible web. However, they also identified



barriers to achieving accessibility, for people with ID and for other disabled web users. These include:

- the attitudes of decision-makers, who may not share participants' commitment to an accessible web;
- the nature of the projects they work on;
- an absence of understanding of the accessibility needs of ID audiences;
- an absence of guidance about how to address these needs, for example within the WCAG guidelines.

The diversity of impairments experienced by people with ID, and their subsequent diverse, complex and non-standardised accessibility requirements, communication systems and assistive technologies account for such absences, as does the historical lack of expertise about ID amongst WCAG working groups. This means that:

- WCAG guidance needs to be exceeded to address ID accessibility needs
- information about how to do this, and on ID accessibility, needs to be made widely available, for example through the development of an online resource.

Key decision-makers in the web design process – clients, line managers, copy writers, editors – play an important role in ensuring maximum accessibility. In order to achieve inclusive new media design and ID accessibility, it is necessary to engage with these stakeholders of web design in future action research.

The recommendations regarding how to encourage or achieve ID accessible design emerging from INMD are:

1. **Develop an online resource about ID accessibility:** including tips, how-to videos, examples of good practice and of user interaction; information about how to exceed WCAG guidelines; and the facility to build a community of web professionals committed to ID accessibility.
2. **Engage with intellectually disabled web users:** most participants cited user testing as the most beneficial aspect of our workshops. User testing put a human face on the issues discussed with participants, and addressed their lack of understanding about ID audiences and their accessibility needs.
3. **Engage a diverse range of stakeholders:** decision-makers affect accessibility practice. Further research needs to engage with a more diverse range of stakeholders – line managers, copy writers, policy makers – in order to make ID accessibility happen.
4. **Develop research with people at the severe/profound end of the ID spectrum:** people at the severe or profound end of the ID spectrum are more likely to be left out of the web, because accessibility measures which address their needs are more intrusive to non-disabled audiences than measures which address mild ID, or sensory or physical impairment. Therefore further action research is needed to attempt to achieve their digital inclusion.

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# 1. Introduction

Inclusive New Media Design (INMD) was a research project funded by the Arts and Humanities Research Council (AHRC) and Engineering and Physical Sciences Research Council (EPSRC) joint initiative *Designing for the 21<sup>st</sup> Century*. It ran for 27 months (from May 2007 to August 2009). INMD aimed to contribute to the social inclusion of people with intellectual disabilities (ID) in the WWW. Specifically, it aimed to identify the best ways of encouraging web designers to build websites which are accessible to people with intellectual disabilities. INMD took place in a context in which there is growing awareness (amongst governments, legislative bodies, and web producers and consumers) of the need for the WWW to be accessible to all of the world's citizens. Efforts to ensure 'access by everyone regardless of disability', most notably in the form of the World Wide Web Consortium's Web Accessibility Initiative (W3C WAI: <http://www.w3.org/WAI/>) exist to achieve this inclusion. Unfortunately, the accessibility needs of people with intellectual disabilities have historically been poorly understood, and therefore overlooked, by such efforts.

The initiatives of the W3C WAI target those people who are responsible for building the web: designers and developers. But how can web professionals build a communication space which is accessible to people with ID if the guidelines offered to them do not address such needs? How effective, anyway, are the guidelines as a means of achieving accessibility? Such questions were at the heart of INMD.

This report presents research carried out on INMD and the findings of the project. Readers interested primarily in what we found should turn directly to section 5: Key findings.

## 1.1 Aims and research questions

The specific aims of INMD were to:

- Examine ways in which socially inclusive new media might be designed for intellectually disabled communities;
- Contribute towards the social inclusion of people with intellectual disabilities in the WWW.

The project attempted to meet these aims by addressing the following research questions:

- How might the social inclusion of people with intellectual disabilities in the WWW be achieved?
- How effective are web accessibility guidelines as a means of achieving such social inclusion?
- What factors affect the take up and application of the accessibility ethos and guidelines in the web design practices of new media designers?
- What is the relationship between accessibility guidelines and the creative design process?
- How effective are other approaches (such as the inclusion of disabled users in the design process or highlighting exemplary practice) in achieving accessible web design?

## .2 INMD team

The INMD team was comprised of:

- Helen Kennedy, Project Director/Principle Investigator (<http://ics.leeds.ac.uk/staff/h.kennedy>; h.kennedy@leeds.ac.uk)
- Simon Evans, Consultant Researcher ([www.cognable.com](http://www.cognable.com); simon@cognable.com)
- Siobhán Thomas, Research Fellow (four@nucleus.com)
- Pippa Sweeney, Project Administrator (sweeney\_pippa@hotmail.com)
- Pat Staples, Web Project Manager ([patstaples2@googlemail.com](mailto:patstaples2@googlemail.com)), working with Prisca Schmarsow ([prisca@eyedea.eu](mailto:prisca@eyedea.eu)) and Ben Shaw ([ben@boshanka.co.uk](mailto:ben@boshanka.co.uk)) on recent site re-design and development.
- A steering committee: Andy Minnion, director of The Rix Centre for Innovation and Learning Disability at the University of East London (UEL); Professor Gavin Poynter of UEL, an expert on work and technological change; and Kevin Carey, director of the charity humanITy: Inclusion in the Information Age, expert and campaigner on digital inclusion for people with disabilities.

Contributions to INMD were also made by the following PhD students at the Institute of Communications, University of Leeds: Vanessa Malila, Fabro Steibel, Anna Zoellner, Jie Zuo.

## 2. Background

### 2.1. Origins of INMD

The concerns addressed on INMD grew out of previous collaborative research on Project @pple (<http://www.thebigtree.org/roots/html/projectapple/index.htm>), which developed a virtual learning environment (VLE) for use in schools and colleges, as a means of exploring how people with ID can participate in the WWW. Whilst Project @pple focused primarily on users, it also attended to the VLE design process, based on the premise that web technologies are ‘ideas made real’, marked by their conditions of production, and that a disabled person’s experience of using the web can be better understood through an analysis of how the web is built.

Project @pple found that, despite the project’s focus on ID, it was more difficult than anticipated to get commercial designers to attend to the accessibility requirements of this population. (For more on Project @pple’s findings, see Bunning et al 2009; Kennedy 2008; Kennedy 2009; Williams and Nicholas 2006). It concluded that more understanding was needed of the design processes of web workers and the impact these processes have on the adoption of the accessibility ethos and guidelines. Thus Inclusive New Media Design (INMD) was born.

## 2.2. What is intellectual disability?

Historically, intellectual disability has been partly defined through Intelligent Quotient (IQ) scores. The World Health Organisation (WHO) defines the ID population IQ range in terms of 0-70 points, compared to a general population range of 100 +/-15 points. While IQ might provide a convenient means of considering the ID group, it does not correlate directly to an individual's support requirements and practical capabilities. Current best practice in assessment and classification, as advocated by the WHO, for instance, usually centres on an individual's adaptive behaviour – a broad personalised assessment examining a range of life skills, social and physical issues.

ID is usually considered in terms of a spectrum of severity, including mild, moderate, severe and profound. This range includes productive individuals living independently, requiring only minimal and irregular support as adults (mild to moderate) and others requiring 24/7 life-long care and support for all aspects of their daily life and personal needs (severe to profound).

People with **MILD** intellectual difficulties might learn slowly in school; they usually have problems reading or writing, but they may still work. They generally have good social relationships and contribute to society with a little help and support.

People with **MODERATE** intellectual disabilities need support to live productive and independent lives as adults. Many people with moderate intellectual disabilities are able to achieve independence through supported living and employment schemes.

Other people have **SEVERE** intellectual disabilities. Even as adults they will need a lot of help and support with daily living. They will often have limited or eccentric communication and will have no literacy or numeric skills.

A smaller number of adults have **PROFOUND** intellectual disabilities and need intense support in all aspects of their lives. They almost always have additional physical and sensory disabilities. People with profound intellectual disabilities may indicate their mood and immediate needs to people who know them well, but do not understand or communicate using conventional language.

In the UK alone, there are 1.5 million people with intellectual disabilities (ID), which affects approximately 17% of all families in England (Mencap 2008). Coincidence of other physical and sensory disabilities is much higher for people with ID than the general population.

Terms such as 'mental retardation', 'developmental disabilities' and 'cognitive disability' are used interchangeably within English-speaking countries to refer to ID. A major source of confusion for UK readers accessing international accessibility guidance has been that the term 'learning disability' is also used in referencing the ID population by influential UK organisations (such as Mencap) and governmental branches. Also confusing is that, for most of the world and within the majority of accessibility related publications, learning disability refers to specific scholastic disabilities such as dyslexia or dyscalculia. The web accessibility guidelines, WCAG 2.0, use the term 'cognitive, language and learning accessibility issues' to refer to the group of people that includes people with ID. Some authoring approaches and assistive technologies serve both people with ID and people with learning disabilities, but the needs of severe and profound ID

users demand far greater technical and authoring adaptations than are generally provided, even by web designers and developers rigorously following best practice as defined by WAI.

## 2.3. Legal Framework

INMD and related debate about web accessibility for people with intellectual disabilities take place within a context of legislative efforts to further the accessibility cause. Such legislation tends to be grounded in the W3C WAI's Web Content Accessibility Guidelines (W3C 2008). In the UK, changes made to the Disability Discrimination Act (DDA) in 2004 made it unlawful to discriminate against disabled people in the provision of services, information, education or employment. The DDA states that 'From 1st October 1999 a service provider has to take reasonable steps to change a practice which makes it unreasonably difficult for disabled people to make use of its services' (Office of Public Sector Information (OPSI) 2005 4.7 p39). Further legislation relating specifically to education is the Special Educational Needs and Disability Act 2001, or SENDA, which makes it unlawful for educational institutions to discriminate against disabled students in the services it provides.

The following example of the services affected by the DDA is given within the Act: 'An airline company provides a flight reservation and booking service to the public on its website. This is a provision of a service and is subject to the act' (OPSI 2005, 2.13 - 2.17). The Act continues:

5.23 : For people with visual impairments, the range of auxiliary aids or services which it might be reasonable to provide to ensure that services are accessible might include ... accessible websites.

5.26 : For people with hearing disabilities, the range of auxiliary aids or services which it might be reasonable to provide to ensure that services are accessible might include ... accessible websites (OPSI 2005).

However, whether the legal requirement not to discriminate is the same as a legal requirement for accessibility remains to be fully tested, as no cases have been brought to court in the UK. Furthermore, the status of people with intellectual disabilities within the legislation is unclear, given their relative absence from the WCAG guidance, which is discussed further in section 5.4 'ID accessibility: its place in WCAG and in web design practice' below.

## 2.4. Previous Research

Previous academic research which forms the context for INMD can be categorised into three broad areas:

- intellectual disability and ICT use;
- web accessibility;
- cultural industries and new media work.



### 2.3.1. Research on intellectual disability and ICT use

Williams and Nicholas summarise some of the research on the use of ICTs by people with intellectual disabilities in 'Testing the usability of information technology applications with learners with special educational needs' (2006). Here, they identify a range of issues which affect the accessibility of IT or web content for people with ID, including: difficulties processing text (Harrysson et al 2004); the need for speech alternatives to written text, simple structures, and regular feedback (Brown et al 2002). In addition, they point to the following key problems for people with dyslexia:

- Unclear and confusing layout of pages
- Confusing and disorienting navigation mechanisms
- Inappropriate use of colours and poor contrast between content and background
- Graphics and text too small
- Complicated language or terminology (DRC 2004).

The research referenced here, like other research in the area of disability and web/ICT participation has focused on users, examining the usability of a range of technologies (Nisbet and Poon 1998) or the contribution they can make to improving disabled users' lives (Roulstone 1998). In contrast, our research focuses on producers. As Adobe's chief accessibility advisor, Bob Regan, has observed, 'in order to understand why there are so few sites that illustrate great design and great accessibility, web design needs to be understood as a practice of individuals. Sites are built by people, not principles or standards' (Regan 2004).

### 2.3.2. Research on web accessibility

Studies of web accessibility tend to focus on accessibility for people with visual or motor impairments, examining the accessibility of a particular web product for particular audiences. They often conclude that the website(s) under investigation, or the web in general, is not accessible. Examples include Kelly 2002, DRC 2004, Coyne and Nielsen 2001, Craven and Brophy 2003, Lazar et al 2004, which cover a broad range of public and private sector websites and find diverse and multiple examples of inaccessibility. Whilst it is true that much of the web remains off limits to many people with disabilities, we suggest that research into accessibility needs to go further than statements of the web's inaccessibility, to ask *why* the web is inaccessible, and whether it is possible to overcome barriers to accessibility. Such research should take into account the range of social, cultural, political and economic factors at play in building the web.

None of the research mentioned so far addresses intellectual disability – Lazar et al's study considered *only* visually impaired web users. Where cognitive disability is considered, it is often in the form of dyslexia, for example in the UK Disability Rights Commission's 2004 report on web accessibility. There are a small number of studies which focus on the accessibility needs of people with cognitive disabilities, such as Friedman and Bryen (2007), Karreman et al (2007), Sevilla et al (2007) and Small et al (2005). This is valuable research, which contributes towards building up a picture of what does and does not work for intellectually disabled users accessing the web. But, as we have stated, in order to understand how to include people with ID in the WWW, it is



necessary to turn attention to those doing the implementing – web designers and developers.

### 2.3.2. Research on cultural industries and new media work

Given the absence of attention to the role of those who produce the web in the research cited so far, INMD is perhaps more appropriately located not in the accessibility literature, but in the emerging field of the study of media and cultural industries. The last decade has seen a growth of interest in cultural labour, an acknowledgement that media and cultural flows involve work, and a focus on creativity as instrumental of economic growth (for example Banks 2007, Deuze 2007, Florida 2003, Hesmondhalgh 2007). Leading scholars acknowledge the need for more empirical studies of the working practices and conditions of cultural labourers, how they feel about their work and what their work means to them (Hesmondhalgh 2007).

Yet even though such studies have begun to emerge, very few of these have focused on web designers, or new media workers more generally, despite the burden of representing work in the new economy which is often placed on their shoulders (those studies that do exist include Gill 2002 and 2007, Kotamraju 2002, Neff et al 2005, Ross 2003, Terranova 2000, Wittel 2001, Wittel et al 2002). In one sense, then, INMD represents a response to this absence, through its commitment to contributing to knowledge and understanding about the work of web designers. What's more, it addresses a gap in this literature, by looking at the consequences for *consumers* of the design practices of *producers*.

## 3.0 Methodology

At the core of INMD was a desire to develop an understanding of web work, in order to improve not only professional practice, but also the social inclusion of people with intellectual disabilities. This need was the impetus for designing INMD as a qualitative action research project. INMD centred on a series of workshops in which we provided free training in the area of ID accessibility and, in return, participants shared information with us about their work experiences and accessibility practices. As might be expected from a research project dealing with web accessibility, a project website helped us to share information and archive workshop materials ([www.inclusivenewmedia.org](http://www.inclusivenewmedia.org)).

### 3.1 Participant recruitment

Thirty-one web professionals were recruited as participants on INMD – information about them can be found in Section 4 on participant profiles. By ‘participation’ we mean taking part in interviews and/or workshops – most participants (28) took part in both; three were unable to attend the workshops due to other commitments.

A number of different mechanisms were used to recruit participants. Two team members attended the @media conference for web designers and developers in London in June 2007 to distribute leaflets publicising the project and the free training workshops we

were offering. We also spoke about the project in one of the organised sessions. An early version of the project website, with the specific purpose of recruiting participants, was used to promote the INMD workshops online.

In addition, a targeted recruitment email was sent to:

- Web design and development agencies and directories;
- E-commerce and supermarkets' web teams or website designers;
- London attractions (such as museums, Madame Tussauds, London Eye, London Dungeons) and London football teams;
- Media companies, including television channels, individual programme websites, music websites and entertainment/games websites;
- Web teams and webmasters at London Borough Councils;
- Web design networks, including the Guide of Accessible Web Designers (GAWDS);
- Existing networks and contacts in web design and new media;
- Web teams in utility companies (such as telecommunications);
- Online shopping websites;
- Some new media university course directors, who were asked to forward information about INMD to alumni.

### 3.2 Participant selection

From the above, more than 100 web designers and developers expressed interest in our project. These respondents were then asked to complete an online profile form about their experience of web work, web accessibility and their interest in our project – just over 50 respondents did this. We reviewed all responses from potential participants to assess levels of web experience and accessibility knowledge. Because we wanted our participants to be experienced and practising web designers or developers, we selected respondents who could demonstrate this, usually through links to URLs of current or past work, or their descriptions of their approaches to web design and development. Previous accessibility knowledge was not a requirement – indeed, we wanted to recruit participants with a range of accessibility experience. At the end of this process, we arrived at our list of 31 participants.

### 3.3 Pre-workshop interviews

Each of these 31 participants was interviewed, to find out about: how they got into web work; their attitudes to their work; their web design and development practices; how they keep up with new developments in web work, particularly with regard to accessibility; and their level of understanding and experience of accessibility, particularly ID accessibility. Most of these interviews were carried out face-to-face; some were carried out on the phone, and others online. The interviews informed our workshop design and helped us to ensure that the workshops met the aspirations of our participants.

## 3.4 Workshops

We ran two workshop programmes: a 7-day workshop programme (involving 21 participants) and a 2-day programme (involving seven participants). The 2-day workshop programme was a late addition, born out of our desire to capitalize on the commitment to ID accessibility that was demonstrated by more web designers than we could accommodate on our 7-day programme, and to allow interested web workers who could not commit to 7 days of workshops to take part.

The workshops had four purposes: to pass on information about ID accessibility; to inspire designers by highlighting/profiling exemplary accessible design; to explore and share solutions to accessibility problems; and to introduce designers to intellectually disabled users.

The workshops took place between January and May 2008. The 7-day programme started in mid-January and finished in mid-May, with one or two workshops running approximately monthly; the 2-day programme ran for two consecutive days in mid-May. The content of the workshops can be summarised as follows:

- introduction to general accessibility (optional first day on the 7-day programme)
- introduction to ID accessibility
- ID accessibility techniques: working with visuals; structure and navigation; working with textual content
- evaluation of existing sites designed for ID audiences
- developing ID accessible web prototypes (7-day programme only)
- user testing, preparation and evaluation
- action and implementation plans for ID accessibility
- guest speakers (7-day programme only)
- top tips from an expert panel.

We collected data at both the 7-day and 2-day workshops through rigorous note-taking, video-recording, the taking of photographs and through feedback forms which we asked participants to complete at various points throughout the workshop programme. Together, these approaches allowed us to gather group thoughts, record individual experiences and manage our data, as the photos and video footage served to remind us of who worked together on particular activities or attended particular workshops, and to capture simultaneous conversations which it was not possible to observe.

## 3.5 Follow-up to the workshops

We initially imagined that each workshop would be followed by participant observation sessions in the workplaces of designer participants. In these sessions, the following topics would be discussed: the extent to which accessibility guidelines were being adopted by research participants; particular accessible design challenges, such as dynamic content; and the impact on the design process of viewing exemplary accessible design, working with intellectually disabled users and of different clients. In reality, and as Domingo (2009) has noted, observation as a method is limited when it comes to research with media workers for whom a large part of the working day is spent in front of the computer – there is not much to observe! Similarly, the new media workplace of a

number of our participants is their home, a rather private and potentially unsafe space to carry out interviews, which instead took place in cafes and other convenient public locations.

Therefore, instead of observations, we arranged a follow-up session six months after the workshops had finished, through which we aimed to: bring participants together and catch up; talk about their work since participating in INMD and whether participation resulted in any changes in their working practices; get feedback from participants on our updated project website; and present to participants (and get their feedback on) our initial research findings. Sixteen participants attended this meeting from both of the workshop programmes.

## 4.0 Participant profile

Thirty-one web professionals participated in INMD (28 workshop and interview participants and three interview-only participants). Thirteen participants were female; 18 were male. Close to three-quarters of our participants were under 40 years of age.

**Table 1. Participant age range**

20 to 29 years	13
30 to 39 years	10
40 to 49 years	6
50 to 59	2
	n=31

### 4.1 Employment details

As might be expected in a project of this length, over its course participants changed jobs and left workplaces, thus confirming the finding of Gill (2007) that working in the new media sector is precarious and unstable. At the start of the project, 27 participants were employed and five were self-employed (some participants were both employed and self-employed). Four participants who were employed did web design and development ‘on the side’ and used their stable roles, for example as the head of a media production centre, to support themselves.

**Table 2. Types of organisations participants work in**

commercial	2
commercial web design agency	1
commercial web development company	4
education/ training organisation*	2
government/ community service	3
large telecoms	2
performing arts (dance)	1
public media company	3
small web design company/sole trader*	5
university	9

\* 1 participant was simultaneously running her own small company and teaching at a training organisation.

Web work is a field characterised by diverse job titles. Participants' varied job titles reflect the range of activities involved in building the web, including information architecture, project management, front and back-end coding, and visual design.

**Table 3. Participants' job titles**

Accessibility Usability Specialist	Learning Materials Developer (2)
(Creative) Director (3)	Learning Technology Advisor
Design Consultant	Lecturer
Digital Content Producer	Product Development Manager
Distributor	Technology and Information Manager
Head of Media Production Centre	Trainer
Information Architect (2)	Web Assistant
IT Co-ordinator	Web Designer (4)
IT Support, Age and Disability department	Web Developer (4)
Knowledge Transfer Associate	

Our project attracted web professionals in all stages of their careers. Six participants had been involved in web work for over a decade, and thirteen had worked in the field for six years or more.

**Table 4. Years of experience doing web work**

2 or less	6
2 to 5 years	12
6 to 9 years	7
10 or more years	6

## 4.2 Participants' accessibility experience

Twenty-five out of 31 participants had experience of web accessibility. However, only eight participants said they were aware of the ID user group, and only two of these eight participants had engaged in web development work for ID audiences. Six participants had experience of cognitive disability and accessibility in their work, predominantly through considering the accessibility needs of people with dyslexia.

All participants except two knew of the WAI's Web Content Accessibility Guidelines (WCAG; <http://www.w3.org/TR/WCAG/>). However, only 20 had read the guidelines firsthand; others read about them, for example in the websites and blogs of web design gurus (that is, people influential in shaping the future of web design). In one of the workshops on the 7-day programme, in response to an ad hoc question about whether participants felt they *understood* the guidelines, only one participant confirmed that he did.

Participant's practices regarding how they assessed the accessibility of their work varied:

- 17 out of 31 participants routinely used automated accessibility testing tools.
- 18 out of 31 participants made manual accessibility checks against WAI WCAG guidelines.
- 19 out of 31 participants said that they routinely validated their code.

Interestingly, almost three-quarters of our participants (22 out of 31 participants) advised others on web accessibility.



Ten participants had experience testing their websites with disabled users, and five of these participants had experience testing with users with cognitive disabilities. Two participants said they had ID user testing experience.

### 4.3 Reasons for participating in INMD

Reasons for participating in INMD varied, but all participants highlighted a desire to learn more about accessibility. Some participants felt the workshops would provide them with accessibility information that was difficult to find elsewhere or difficult to absorb, either because participants lacked the time required to wade through large amounts of material or the knowledge required to translate current guidelines into practice:

‘I find a lot of accessibility is vague’ (Sofia, design agency director).

‘Although we have tried to take into account all impairments when designing our site, I have come across little in-depth information on designing for users with intellectual disabilities’ (Tom, IT support (age and disability), telecommunications).

‘I find the research online about guidelines and new changes often too time-consuming and isolated’ (Nadine, web designer and lecturer).

Some participants hoped that the workshops would offer access to knowledge that would help them remain at the cutting edge of accessibility:

‘I have been tasked to look at the whole of [my company’s site] with regards to accessibility and I would like to ensure that I am aware of all the latest information to hand’ (John, technology and information manager, telecommunications).

Participants who felt they had a high level of accessibility knowledge viewed the workshops as a ‘check’, a kind of MOT test for their skills:

‘I’d like confirmation that the accessibility practices I am following are correct’ (William, senior web developer).

The appeal of face-to-face interactions with peers was also significant. Some participants welcomed potential opportunities to share knowledge, to see what others were doing, to find out ‘tips and tricks’. Many expressed interest in each others’ views and experiences – this was given as a central reason for participating in our project by some:

‘to learn more and share experience’ (Pietrek, freelance web designer and head of media production facility).

‘I would like to share my knowledge and hopefully learn something too’ (Gregory, self-employed web designer).

The user focus of the workshops was also appealing. One participant claimed that most accessibility workshops fall short, either being too superficial or too code-oriented:



‘I want to add accessibility to my skillset, but existing courses always looked a bit flimsy or quite technical. This seemed more rounded and user-focused’ (Tom, IT support (age and disability), telecommunications).

Another participant said she felt that participation in the workshops would validate the practice of accessibility and make it easier to sell accessibility to others in her workplace:

‘I see the workshops as a way to start moving towards a process where my organisation takes accessibility seriously. I want to know what benefits accessibility can provide [my organisation] rather than just feeling it is a box ticking of government requirements’ (Billie, web developer).

Other participants saw themselves as information conduits, tasked with the responsibility of acquiring essential accessibility information and feeding it back to others within their organisations, sharing with peers or, in the case of teachers, their students.

## 5. Key Findings

In many ways, INMD achieved its aims. It explored the ways in which socially inclusive new media might be designed for intellectually disabled communities – the findings of this exploration are reported here. It was also successful in contributing to the social inclusion of people with ID in the WWW, albeit in a modest way. After participating in the workshops, most participants stated that they had taken some action relating to ID inclusion (for example, adapting use of imagery, language and layout as a result of learning on the workshops). Other participants passed on what they had learned outside the workshops, or planned to take action in the future.

Examples of some of the things that INMD participants said about the action they were undertaking to take account of people with intellectual disabilities in their work include:

‘Use imagery with words. Ensure font is big enough’ (Gregory, self-employed web designer).

‘Use more Ajax to make some things more intuitive; try to offer a tab and hit “space” navigation for portfolio’ (Sofia, design agency director).

‘Re-checked existing work to bring up to scratch, but that then led me to learn new techniques to validate certain mark up (Flash embedding)’ (Patrick, learning materials developer).

‘We produced an e-learning module on disability awareness and added in both rich media and plain text versions’ (Patrick, learning materials developer).

‘I often re-do previous web pages and re-visit content to update, used that as an opportunity to rectify [ID] problem areas’ (Ayesha, web developer).

‘[INMD] has encouraged me to read further in to the subject [of accessibility] and look at becoming a member of GAWDs [Guild of Accessible Web Designers]. It has also encouraged me to feel more engaged and passionate about getting it included in more recommendations I give to clients, whether they have specifically asked for it or not, just to supplement their understanding if nothing else’ (Poppy, design consultant).





'I have since joining INMD workshops introduced and highlighted the importance of accessibility to the company. Colleagues are more aware ... Some are approaching with questions prior to proposal writing' Lily, digital content producer for a large publishing house).

'I now actively bear related issues in mind during design. In some cases, it is not practical to provide total accessibility, but I make more of an effort to' (Renee, learning materials developer).

'I brought the issue of ID accessibility to the attention of my students' (Armando, web designer and lecturer).

'Circulated slides amongst user experience team' (Aaron, information architect at a large media organisation).

'I have written a couple of blog posts and talked to other developers, friends and family about the project' (Gregory, self-employed web designer).

The remainder of this section discusses in detail what we found on INMD, and proposes some answers to our original research questions.

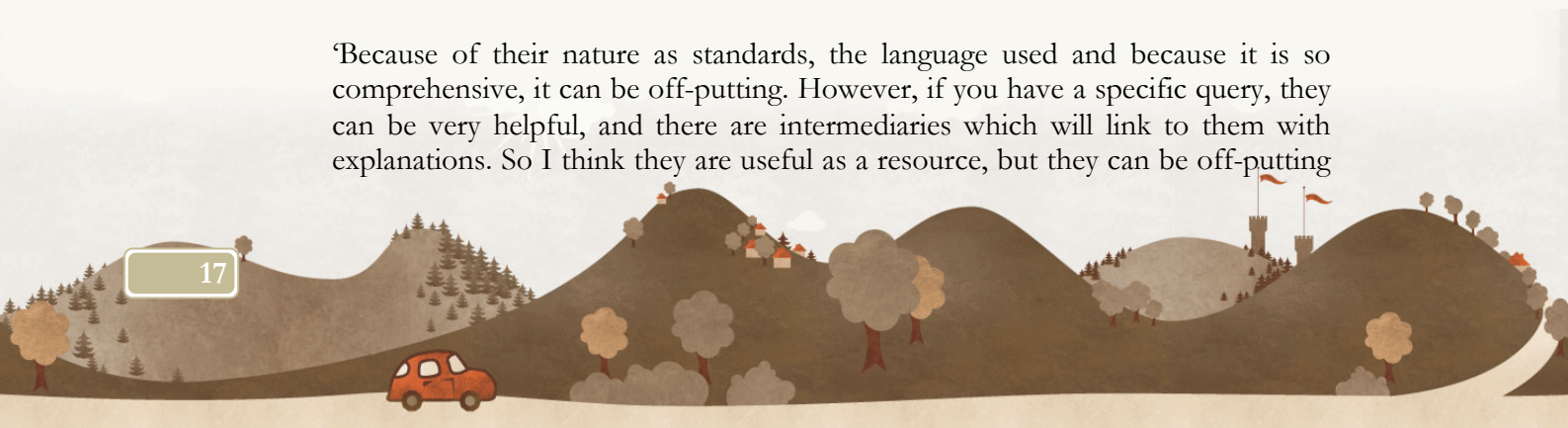
## 5.1 Participants' views of the WCAG guidelines

Addressing research question: *How effective are web accessibility guidelines as a means of achieving the social inclusion of people with intellectual disabilities in the WWW?*

All but two of our 31 participants were familiar with WCAG 1.0 (current at the time of the research) when they joined INMD. However, participants' levels of familiarity with the guidelines varied. While more than half of our participants had read 'bits of WCAG 1.0 on the W3C site', only three indicated that they had read WCAG 1.0 in its entirety. Almost half of our participants chose not to access the guidelines via the W3C site, but relied instead on accessibility and standards knowledge provided by intermediaries, such as web design gurus who provide translations of accessibility guidance via their blogs and presentations delivered on the conference circuit. Thus, a substantial number of participants had not engaged with the guidelines in their primary form, but, rather, had read guides to guidelines.

Why is this? When asked what they thought about WCAG, some participants acknowledged their value, some acknowledged their limitations, and some did both. A small number of participants compared WCAG 1.0 to WCAG 2.0 (as drafted at the time of the research) and stated a preference for the former. About one-quarter of participants described WCAG 1.0 as good, easy, inclusive or 'nice to test against.' One said that they were 'very thorough documents.' But, on the whole, participants were critical of the guidelines, with more than half highlighting the complexity of the language used in the guidelines as a barrier to understanding and, therefore, implementing them. In different ways, participants stated that the guidelines were hard to understand or to work with. Tom, an accessibility professional responsible for advising employees of a large telecom on accessibility practices, said:

'Because of their nature as standards, the language used and because it is so comprehensive, it can be off-putting. However, if you have a specific query, they can be very helpful, and there are intermediaries which will link to them with explanations. So I think they are useful as a resource, but they can be off-putting



because of the language and way they are structured' (Tom, IT support, telecommunications).

Further, the guidelines are time-consuming to engage with. Time-starved web professionals trying to implement accessibility in the fast-moving world of web work often cannot spare the time to wade through them in primary form. Consequently, when asked for alternative ways of presenting the content of the guidelines, participants suggested, for example:

- a summary of it, like 10 things to keep in mind
- provide [...] real-world examples of things that are done very well
- an executive summary
- do this, don't do this, rather than an essay
- more graphic design
- case studies
- more user-friendly format.

A number of participants acknowledged the danger of a tick-box culture that the guidelines can generate, in which web designers might become more concerned with validating code than with producing a genuinely accessible site. Armando, a trainer at a London-based innovation centre, explained the pitfalls of conforming blindly to guidance:

'I think they're a lovely, philosophical, well-meaning piece of documentation which causes more harm than good, because too many people, if they think about accessibility, think WAI and that's it. They think as long as they put WAI at the bottom, then their website is good, as long as they pass the WAI validation, that's it, they walk away from it. And it's far more sophisticated and important than just passing one specific document. I don't think validation is important. I put a lot of emphasis on the word usability rather than accessibility, a site needs to work rather than be valid' (Armando, web designer and lecturer).

These comments suggest that the WCAG guidelines have done the job of putting accessibility on the agenda of web professionals, who are aware of them, and engage with them in various ways. But they also suggest that the effectiveness of WCAG has its limits – they are seen as complex, difficult to understand and therefore difficult to apply.

One of the things at issue here is guidelines per se, not the WCAG guidelines in particular. Guidelines in general are not enough, with their checklist, tick-box orientation, because alone, they do not serve to guarantee genuine inclusion. Consequently, supplemental approaches such as those that we adopted on INMD, where designers and developers seek guidance directly from users, seem necessary. On INMD, such approaches have contributed to changes in design practice.

## 5.2 The place of accessibility in the work of web designers

Addressing research question: *What is the relationship between accessibility guidelines and the creative design process?*



INMD participants are not alone in their concerns about and criticisms of the WCAG guidance. In online discussion about the guidelines amongst web professionals, they are criticised for being verbose, lengthy and full of jargon (Moss 2006). A further criticism is that adherence to them does not necessarily result in genuine accessibility (Clark 2006 and Sampson-Wild 2007). But despite the limitations of the WCAG guidelines, accessibility has become an integral component of the work of the web professional. Most participants on our project said that they considered accessibility to be a ‘core part’ of their work. This is something relatively new, compared to ten years ago, when the idea that web designers and developers might build their sites so that they could be accessed by disabled communities was in its infancy. Then, it was common for people working in the field to feel that designing accessibly limited creativity. This notion prevailed because an accessible site was thought, by necessity, to be a dull, media-poor and text-rich site. That historical moment seems to have passed. Now, accessibility is no longer seen to hinder creativity – instead, creativity needs to be mobilized to come up with accessible design solutions:

‘I love limitations. [...] If I’m faced with a blank canvas I’m terrified. It must be 700 pixels, accessible, work for blind people – accessibility can be thought of as a limitation, but not for me. It helps me. To stay sane in a world where anything is possible’ (Pietrek, freelance web designer and head of media production facility).

What motivates web designers to want to build accessible websites? When we asked some of our INMD participants what made them start wanting to produce accessible websites, only one participant, a corporate product development manager, mentioned the UK’s Disability Discrimination Act (DDA), which makes it unlawful to discriminate against disabled people in the provision of services, information, education or employment. She said ‘In the first instance, it was client driven. A lot of our clients are bound by the DDA to make their sites accessible’. Others said that their motivation was user-driven – either an understanding of the difficulties disabled users face, or a love of the web and a commitment to the principle of access for all. Similarly, when asked why they were willing to dedicate up to seven days of their time to attend INMD workshops (which, for freelance participants, meant seven days without pay), the following were amongst the reasons given:

‘I consider accessibility to be a core part of my discipline’ (William, senior web developer).

‘I would like to improve my practical knowledge of web accessibility to improve my professional practice generally’ (Frances, lecturer and freelance web developer).

‘Need to adhere to best practice, or at least try to get there’ (Billie, web developer).

There are also a number of contextual factors that have contributed to the uptake of accessibility amongst web professionals. They include the efforts of the WAI and their propagation of accessibility guidance. The criticisms notwithstanding, the initiative has been central to the dissemination of the accessibility ethos – it is hard to imagine the changes described above happening in their absence. As a result of their work, the makers of key web design tools, such as Adobe (formerly Macromedia) have made changes to widely used software applications like Dreamweaver, so that it is now much easier to build an accessible website using this tool, which historically wrote both



inaccurate and inaccessible code. Likewise, the evangelizing by web design gurus about ‘mainstream’ accessibility (that is, accessibility for people with physical and sensory impairments) has also inspired more and more web designers to build accessible websites.

A further change has been the increasing prevalence of discursive repertoires about ‘being a good professional’ in talk amongst web designers, which demonstrates their growing concern with their own professionalism, and with providing professional services – this can be seen in the quotes above. This concern arises in the absence of a recognized professional association or code of ethics for web designers. Through this talk they construct their own definitions of their labour, and of what constitutes ‘good professionalism’. Building accessible websites is a core component in being a good professional, as it allows web designers to demonstrate their professionalism through adherence to standards, which in turn serve to enhance and strengthen the Web and ensure it operates smoothly (Stienstra 2006; see also Kennedy 2010 forthcoming for more discussion of the professionalisation of web design).

The commitment of INMD participants and other web designers and developers to accessibility also arises from their passionate love of web work and of the web itself – the two merge into one. This passion is evidenced in the small scale studies of new media workers carried out by Gill (2007), Ross (2003) and Terranova (2000). It was also noted in the much larger scale survey of web design work undertaken by the AListApart website. Of the 32,831 web professionals who took part in the latest version of the survey in 2007, 94.1% said they were excited by the field – 35% very frequently, 43.6% frequently, and 18.5% once in a while (AListApart 2007). Only 1.4% of participating web workers claimed that they were not excited by the field. An INMD designer communicated his/her passion in the following explanation of his/her reason for participating in the project:

‘Probably the main reason I love the industry I work in so much is the communication aspect, so that anyone anywhere can communicate with anyone else because of this brilliant tool. And every day that excites me and it excites me how different people use it and the new things and the new ideas people are coming up with. Underpinning all that, my interest in usability and accessibility is trying to make sure that anyone, on any device, with any ability, can use that communication tool, because I think it would be a grave shame if we didn’t make sure that it was open to everyone’ (Gregory, self-employed web designer).

This broad range of factors – personal commitment, growing concern with professionalism, changes in the tools of web design, evangelising by the WAI and by web design gurus, and the existence of both detailed technical guidance and related legislation – have all contributed to make web accessibility much more central to web work today than it was when the notion first came into being.

### 5.3 Factors affecting accessible web design practice

- Addressing research question: *What factors affect the take up and application of the accessibility ethos and guidelines in the web design practices of new media designers? and How effective are other approaches (such as the inclusion of disabled users in the design process or highlighting exemplary practice) in achieving accessible web design?*



However, building an accessible website is complex, and there are a number of factors that affect the take up and application of the accessibility – both in relation to the ID community specifically, and in more general terms. These can be classified according to the following list, where the first two points relate to general, or ‘mainstream’ accessibility, and the last two points relating to ID accessibility in particular:

- Attitudes of decision-makers
- Nature of projects.
- Awareness of ID user group and accessibility needs
- Absence of ID accessibility guidance.

### 5.3.1. Attitudes of decision-makers

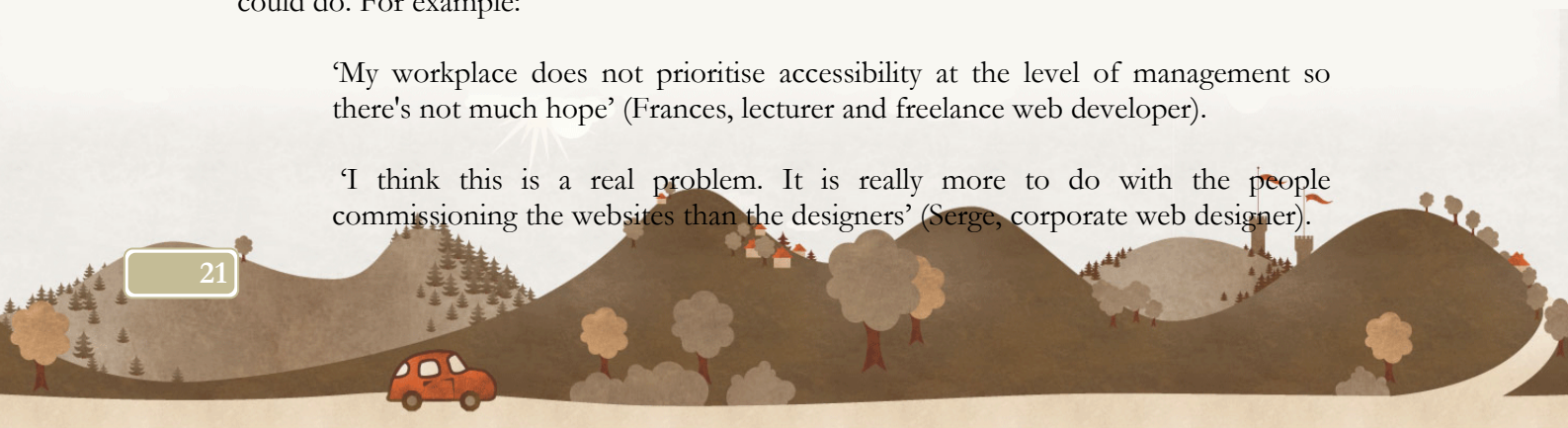
The decision makers with whom our participants work also affect accessible practice – line managers, clients, content producers or others may not share our participants’ commitment to accessibility (in general, or specifically in relation to ID). Whilst the workshops were running, we asked participants what obstacles they had encountered to implementing ID accessibility, and a common response was that clients or equivalent decision-makers did not care about accessibility, did not want it, or wanted to retain inaccessible elements in their websites, such as confusing labels for functional features. This can apply both to ID accessibility, and to accessibility more generally.

The impact of decision-makers on accessible design could be seen in the changes observed amongst participants between the end of the workshops and our reunion with them six months later. When the workshops finished, most participants had identified some steps which they could take to build a more ID accessible web, and some had already taken these steps. At the same time, they also identified barriers to achieving this. When we met again six months later, the balance of simultaneously identifying barriers to and strategies for ID inclusion appeared to have tipped. For many, six months back in the field resulted in them being more overwhelmed by barriers, despite what they learnt and applied during the workshops. We asked them to draw visual representations of their experiences on INMD, and common metaphors were long roads and walls as obstacles which needed to be knocked down, as seen in figures 1 and 2 below. Some said that they had not taken any steps towards ID inclusion, or that they could not, which contrasted sharply with the action that they previously identified that they had taken, which is discussed in (5) above.

Some of our participants, after six months back at work, felt that they did not have the power to affect change on behalf of this community of web users. They claimed that we should be targeting not them, web designers, but ‘stakeholders’ – line managers, clients, decision-makers. Without them on board, there was nothing they, the web designers, could do. For example:

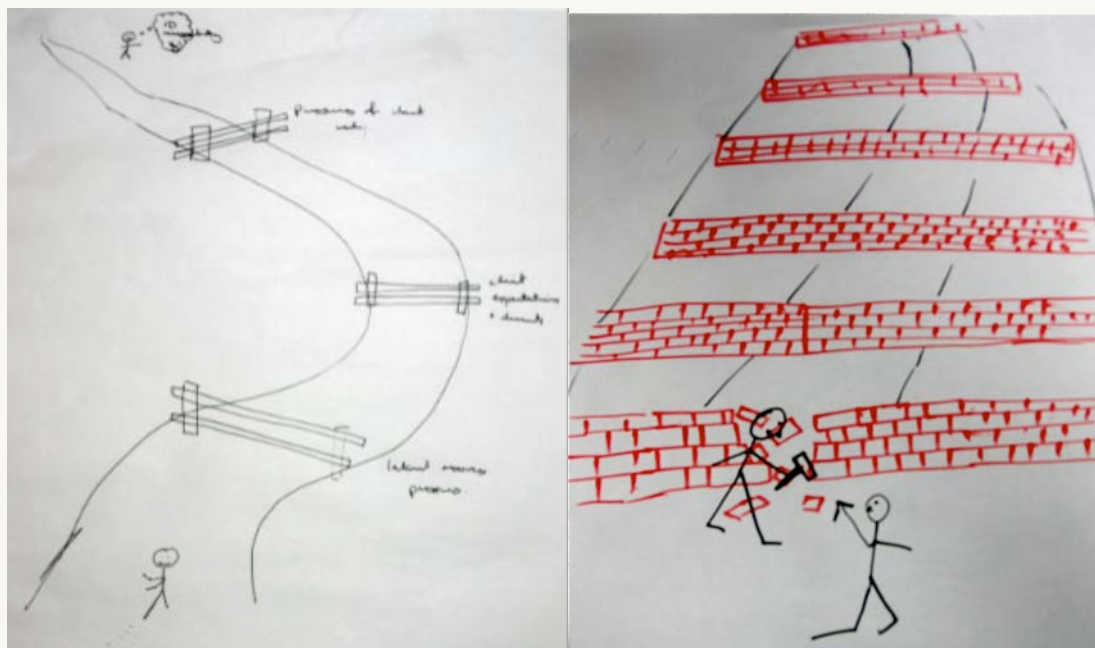
‘My workplace does not prioritise accessibility at the level of management so there's not much hope’ (Frances, lecturer and freelance web developer).

‘I think this is a real problem. It is really more to do with the people commissioning the websites than the designers’ (Serge, corporate web designer).



Others held the opposite view – as a commissioner, one participant said, she was committed to accessibility, and needed projects such as ours to show designers what techniques they could deploy. Thus when it comes to building an accessible web, the location of power is complex. It is not *simply* the case that web designers, through their choices and actions regarding accessibility, are empowered to enable or disable web users. This suggests that future research in this field should engage with a broader range of stakeholders – not just the web designer or developer, but also the line manager, the copy writer, the commissioner, or the policy maker – in order to make ID accessibility happen.

At the same time, some participants have identified strategies to work around the obstacle of decision-makers' attitudes. Billie, a web developer in a performing arts organisation, said 'I am trying to think about how far our organisation is willing to go. Maybe start to implement "invisible" elements.' Similarly, Paul, the creative director of an independent web design agency, claimed that he rarely discusses accessibility with clients, because they don't understand it, and shouldn't need to. His clients are 'commissioning a professional to build a professional level solution for them' and as for him 'building an accessible site is no different to building a regular site', he simply gets on and does the job.



Figures 1 and 2: Two participants' drawings of their experiences on INMD. Fences and brick walls represent obstacles to achieving accessibility.

### 5.3.2. Nature of projects

The nature of the projects that our participants work on is also a factor affecting accessible design, both general and ID-specific. Some feel that the back-end coding that they do cannot affect ID accessibility in the same way as front-end design: 'I'm still not sure how I can bring this into my everyday work,' said Timothy, a self-employed web developer. 'It's something I hope to do some personal projects around, but I'm not sure yet how I can bring it into my client work. Currently I seem to be brought in to help finish off projects that need to get done quickly. If I get to work on any projects from

nearer the start then hopefully I can bring these issues to the table.’ Other participants expressed similar sentiments:

‘Working on projects with larger teams and requirements set by a client means that it is too difficult to build a collective consensus to implement accessibility’ (Frances, lecturer and freelance web developer).

‘It all depends on the particular piece of work and who the audience is likely to be. As wide a group of users should be supported on all projects, but some are more realistic to persuade clients to accommodate than others unfortunately’ (Poppy, design consultant).

‘Most work I’ve done recently has been for backend. No input on UI [user interface]. Already designed as a static picture’ (Timothy, self-employed web developer).

### 5.3.3. Awareness of ID user group and their web use

To build websites which are accessible specifically for ID audiences, web designers and developers first need to be aware that ID users exist as potential site visitors. Prior to participating in INMD, most of our participants had no experience or understanding of intellectual disability. ‘It never crossed my path,’ said Armando, a web designer and lecturer. The widespread invisibility of this community leads to a genuine lack of understanding of what intellectual disability is, and a parallel lack of awareness of the accessibility needs of ID web users. Meeting people with ID raises awareness of who they are. Further, the diversity and complexity of ID can only really be grasped through contact with people with intellectual disabilities themselves. These considerations led us to build user involvement in the form of user-testing into the design of INMD. In the user-testing sessions, participants either tested prototype products they had made in collaborative groups, which aimed to incorporate some techniques to enhance ID accessibility, or, if they preferred, they carried out a test, which we designed, of a web product targeted at ID users. Our hypothesis was that putting web designers and developers together in the same room with people with intellectual disabilities, and facilitating a dialogue about the latter group’s web use, would go a significant way towards contributing to the inclusion of people with ID in the WWW.

Our hypothesis proved correct. When asked to identify which aspects of the workshops were most beneficial in encouraging them to build ID accessible websites, most important for our participants were the opportunities provided to engage directly with ID users during user testing. We found that these user-testing sessions were especially significant in raising awareness and understanding of ID accessibility, particularly the complexities of designing for such a diverse audience. Participants pointed out that despite discussing in detail the accessibility needs of the ID community in workshop sessions prior to the ID user testing, ID was, as Sofia, a design agency director said, ‘a very vague thing’ and an ID user, ‘someone I couldn’t really judge [before today].’

User testing put a human face on the issues we had previously discussed with participants. Meeting the user group, seeing their reactions, getting honest and sincere feedback were aspects of the user-testing experience that participants found valuable:



‘In order to design for accessibility, you need ID users to test your sites. Things we would not think to pick up get highlighted. There is nothing more effective than getting actual users to test your products’ (Natasha, an information architect from a large media organization).

‘The extensive testing on our shops with various user abilities had a profound impact on me and showed me that what I took for granted wasn’t obvious to everyone and that we need to broaden our horizon. It was very useful to have this feedback from the testers’ (Sofia, design agency director).

When asked how to ensure that people with intellectual disabilities are included on the web, half of those who responded said through user testing and user participation in the process of building the web. Likewise, when asked how to encourage other web professionals to do ID accessible design, and how to spread knowledge about ID accessibility issues, our participants advocated a user-testing approach suggesting ‘free user testing days’; ‘info on how to access affordable user testing’; and ‘user testing sessions on university degrees and other courses.’

However, two participants were critical about our approach to user testing. As user testers did not join us until the fifth workshop in the seven-day programme, one participant said after the first day that we should talk to, not about, disabled web users. Later on, another participant suggested that the process of developing prototypes could have been more participatory, engaging ID users as experts in their own web use and therefore co-producers in the development process, not just as testers. This suggests that further research in this area should adopt a more participatory approach to design, to explore the kinds of development practice that would facilitate genuine inclusion of people with ID in new media.

User-engagement on INMD had a profound impact on the way that participants conceptualised accessibility:

‘It’s made me realise that [accessibility is] about targetting a wider audience, rather than just those with visual and motor impairments that most content I’d read previously had concentrated on’ (Jane, corporate product development manager).

‘I have gained a new perspective on accessibility. Away from the mainstream accessibility issues, looking at less discussed yet very basic/practical needs of ID users to interact with IT and the web’ (Lily, digital content producer for a large publishing house).

For most participants this new perspective involved ‘a general attitude that accessibility covers a broad range of people, all with separate and differing needs that need to be considered’ (Poppy, design consultant). ‘I am more aware of accessibility issues and much more aware of the extent of a diversity of people’s uses of online media’ said Frances, a lecturer and freelance web developer. User involvement was a costly and time-consuming element of INMD, yet was clearly much valued by participants, and instrumental to their understanding of the ID audience and their web use.

#### 5.3.4. Absence of ID accessibility guidance





It is one thing to be aware that a user group exists; it is another to build accessible websites for that group. INMD participants who were familiar with the ID user group before participating in INMD said they were interested in participating in INMD because they felt ill-equipped to address ID accessibility needs in the context of the web: ‘I felt I knew a lot about learning disability as I’ve met a lot of people with them and helped run art groups with them,’ said Timothy, a self-employed web developer who also volunteered for an art group for people with intellectual disabilities. ‘I didn’t really feel like I could apply that to websites.’ Another factor that affects the application of the accessibility ethos for ID communities, then, is the need to understand exactly how to do this.

However, a number of participants expressed concern that this information is not readily available. Indeed, the absence of such guidance is what motivated some to participate in INMD in the first instance, as discussed in 4.5. above. During the workshops, when asked if they could foresee any obstacles to implementing learning in relation to ID accessibility, responses such as the following surfaced:

‘Lack of definitions. No standards/recommendations’ (Gregory, self-employed web designer).

‘No real specifications to clearly work towards a better product. Clients don’t care. Need formal guidelines to enforce the justification and need for ID accessibility’ (Ayesha, web developer).

‘Not clear on any specifics that need to be implemented to ensure ID accessibility’ (Armando, web designer and lecturer).

‘No clear idea of how and when to design specifically’ (Nadine, web designer and lecturer).

Those WCAG guidelines which do attempt to address the accessibility needs of web users with cognitive, language or learning issues, to use WCAG’s own terminology, are perceived as inadequate un addressing the needs of people with ID by many INMD participants. The omission of the ID audience from the accessibility ‘landscape’ has an effect on perceptions of what constitutes accessibility. ‘Accessibility is often viewed as only being about screen readers’, pointed out Serge, a web designer for a commercial web development company. It also impacts on the strategies that web professionals develop to address ID accessibility. In the absence of specific guidance, said Ayesha:

‘It’s an area of judgement call, personal perception. It can be quite difficult to achieve effectively for all IDs. A general perception which I took away was to keep language simple as a starting point and possible use of icons, although I’m not sure everyone understands icons in the same way’ (Ayesha, web developer).

In other words, in the absence of clear guidance, web designers and developers make their own decisions about what they can and will do to enhance ID accessibility. Thus we can conclude that guidance about ID accessibility is needed, and needs to be made widely available. Our participants suggested that this could take the form of an online resource, incorporating tips, clear guidance, case studies, examples of good practice, videos of users and their assistive technologies, examples of common mistakes, and information about how to access affordable user testing. The importance that participants attached to contact with like-minded peers on INMD also suggests that a networking and community-building facility would be an essential element of such a resource.



## 5.4 ID accessibility: its place in WCAG and in web design practice

Addressing research questions: *How might the social inclusion of people with intellectual disabilities in the WWW be achieved?* and *How effective are web accessibility guidelines as a means of achieving the social inclusion of people with intellectual disabilities in the WWW?*

### 5.4.1. Why is it difficult to develop ID accessibility guidelines?

There are a number of practical reasons why development of guidelines for ID accessibility, particularly in the form of explicit testable techniques, is difficult.

Firstly, the accessibility requirements of people with ID are complex; because it is difficult to generalize about intellectual disability, it is difficult to produce guidelines for ID accessibility. The complexity and diversity of the ID population itself, where a large proportion of individuals have multiple and pervasive impairments, requires an equally complex set of solutions, not only in terms of design and development, but also with respect to content authoring. Many users considered to have mild ID can be included by sites with a very strong, but conventional, focus on usability and accessibility. Conversely, audiences with more severe manifestations of ID are likely to have extremely limited, eccentric styles of communication and minimal IT capability, thus requiring radical access and information solutions. Because it is difficult to generalize about ID, it is difficult to produce guidelines for ID accessibility.

Secondly, lack of standardisation in respect of communication systems, assistive technologies and approaches used across the ID population create numerous challenges in relation to the accessibility of content, applications and new media in general. Raising the status of ID within organisations such as W3C or WAI is an essential part of addressing this particular issue.

Thirdly, the now-current WCAG 2.0, in common with most accessibility guidance, is predicated on the assumption that accessibility is not achieved unless a user has fully independent access throughout each single process or experience. However, a critical factor in ID is human support, which for those with the most severe disabilities is high, allowing human mediation of barriers. WCAG's support of different levels of conformance for individual pages and discrete processes within a site is relevant here, because in relation to severely intellectually disabled web user, it is perhaps reasonable that only a small portion of a site or a particular process is accessible, something that is likely to be perceived as bad practice in relation to other disabled communities.

Web accessibility experts who have been involved in producing the various iterations of the WCAG documents have generally had expertise in the fields of sensory and physical disability. Specialist ID accessibility knowledge has historically been absent from WCAG working groups, and this is a further reason why it has been difficult to incorporate the accessibility needs of people across the spectrum of ID into this documentation. Lack of ID accessibility knowledge – amongst WCAG, web gurus and others – leads to a lack of guidelines, which in turn perpetuates lack of understanding and therefore lack of action.

## 5.4.2. The WCAG guidelines & ID

Even though accessibility has become commonplace in web design practice, ID accessibility is seen by most participants as difficult to achieve. ID users are seen as an extreme user group (as disabled web users have been characterized) who are just too extreme. Despite the fact that one of the four principles shaping WCAG 2.0 is that web content should be understandable, the guidance and techniques grouped under this principle are considered inadequate by INMD participants for ID audiences. The guidelines do not appear to extend beyond mild ID. Substantive barriers for people with intellectual disabilities predominantly fall within areas which within WCAG are considered as supplementary and advisory techniques. And whilst the WAI's draft document 'How people with disabilities use the Web' (<http://www.w3.org/WAI/intro/people-use-web.php>) includes a case study of an individual with mild ID, guidance in respect of the accessibility requirements for individuals with more severe or profound ID has yet to emerge.

But despite the lack of discrete guidance in respect of ID within WCAG, it is possible to base bespoke accessibility policy on the framework it provides. In particular, it is possible to identify ways in which specific 'success criteria' (the term used in WCAG to refer to the ways in which designers can test the accessibility of their sites) should be exceeded. Such an approach would present a convenient means of defining specific accessibility requirements for target audiences within the ID spectrum.

For instance, the use of text as an informational medium presents significant difficulties for the ID audience. WCAG Guideline 3.1.5 Reading Level success criteria require that text content, or a supplement, is accessible by a user with reading ability equivalent to a 'lower secondary school' student. However, as Jones et al (2006) found the *mild* ID population has a median reading comprehension of around 7 years of age, more severely intellectually disabled people would therefore be unlikely to have a measurable reading comprehension age. Usable, testable measures to exceed this criteria could relate to limiting phrase length, the use of pronouns and other semantic devices or setting maximum numbers for information carrying words. Other critical aspects of text accessibility, such as extensive use of white space, ensuring sentences do not extend beyond a single line, or maintaining a fixed visual relationship between text and symbol content, relate to layout as a semantic mechanism. WCAG considers text layout issues with a view to ensuring perceivability of content, but in terms of ID audiences and their use of symbols, layout is also a question of understandability. Yet WCAG advisory techniques do not reflect general practice in symbolized online content or the established paradigms of easy read print publication in this respect, so this is another area where success criteria need to be exceeded.

What we have found on INMD is that while guidelines are a valuable starting point, they alone are not enough when considering accessibility for the ID user group. In identifying ways in which WCAG guidelines could be extended, or in exploring alternative approaches to them, it is not our contention that they are unfit for purpose. Rather, it is that the needs of many within the ID population, and in particular the most intellectually disabled, require very significant adaptations beyond WCAG success criteria. At present, there is currently insufficient information available in relation to the ID audiences. Given the influence and standing of the WAI, we contend that explicit additional guidance is essential for the inclusion of people with ID within accessibility policy and thinking. And



as long as this does not exist, information about how to exceed success criteria needs to be circulated widely within the web design and development industry.

### 5.4.3. ID accessibility: what can be done?

It has been our contention on INMD that it is possible to take some steps towards including people with intellectual disabilities amongst website audiences. We have discussed these steps at length in our workshops and on our project website, which includes a section about building ID accessible sites ([www.inclusivenewmedia.org](http://www.inclusivenewmedia.org)). Put simply, these steps include:

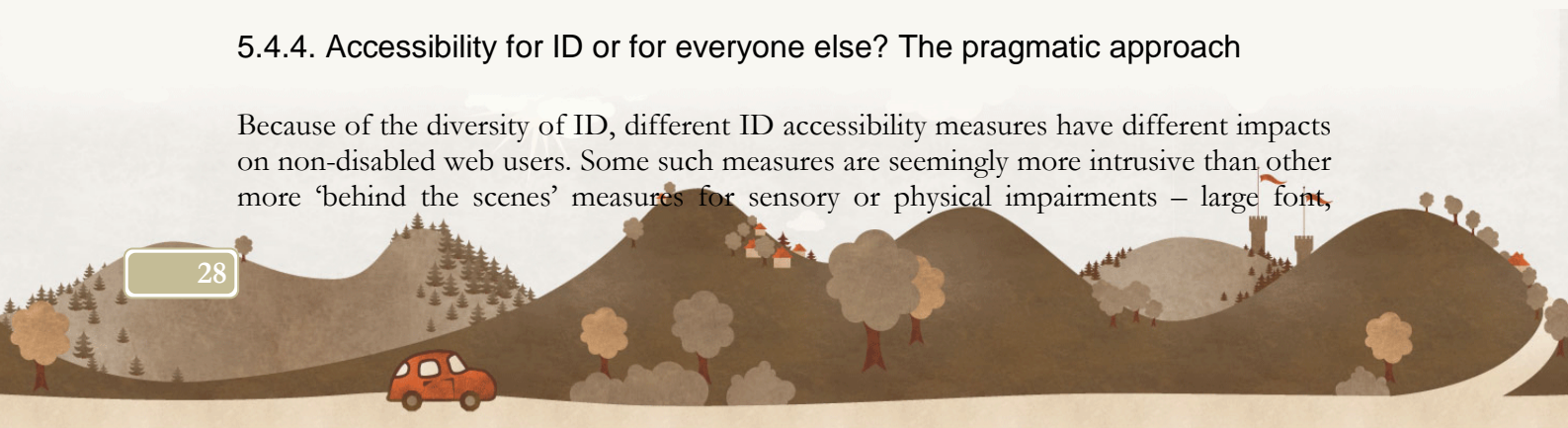
- Include pictures which provide key information and repeat the information you provide in text
  - Have simple navigation, with just a few choices, rather than navigation with lots of choices
  - Incorporate movement and interaction to generate interest: video, animation and sound
  - Use voicing to narrate text on the page
  - Use simple, easy-to-read text and short sentences
  - Involve people with intellectual disabilities throughout your project to advise you on design and to user test.
- (for much more detailed discussion of these points, see our project website: [www.inclusivenewmedia.org](http://www.inclusivenewmedia.org))

But throughout INMD we have also highlighted the diversity and complexity of ID. Because of this, the steps listed above will work to varying degrees, depending on where on the ID spectrum individual site visitors are located. Making a website accessible for people with mild intellectual disabilities will widen audiences, as everyone can benefit from simple text, nice graphics, simple choices and a clear message. People with severe intellectual disabilities need websites with very little text, lots of sound, a very small number of choices, and very deep structures. Such websites will not work for everyone, so might have to be additional, easy-read versions of existing sites. This can mean more work for web designers, but it is a necessary step in order to ensure the inclusion people with more severe intellectual disabilities in the web. The accessibility needs of people with the most profound intellectual disabilities are the most difficult to address, unless a website is built specifically for this group.

But an important message from INMD, to paraphrase the words of Ann McMeekin, a freelance web accessibility consultant and an invited speaker at the workshops, is that accessibility is a journey, not a destination (McMeekin 2008). It is possible to take small steps towards inclusive new media design. This seems to be a message that our participants took away with them, as discussed below.

### 5.4.4. Accessibility for ID or for everyone else? The pragmatic approach

Because of the diversity of ID, different ID accessibility measures have different impacts on non-disabled web users. Some such measures are seemingly more intrusive than other more 'behind the scenes' measures for sensory or physical impairments – large font,



simple language and deep rather than wide structures impact on the usability of a website more than marking up code so it can be read by a screen reader. Conversely, good mark-up for sensory/physical disability will often result in, for example, good search engine optimisation (or SEO), quick downloads, or cross-platform compatibility, and so accessibility for people with sensory or physical disabilities has other pay-offs beyond accessibility. Because of this, most participants concluded that they would adopt simplifying measures that would benefit all users and also include people with mild ID, because, as Sofia, a design agency director, said, ‘making a site more accessible to ID users will make it easier for everyone’. She continued:

‘ID accessibility suggests to make sites more intuitive, a little playful, with images to reinforce meaning, navigation, and not clutter a site too much. Previously, we only concentrated on making navigations text-based for the blind and people with bad eyesight’ (Sofia, design agency director).

Most INMD participants also said they would adopt this pragmatic approach to ID accessibility, stating that they would cater to mild ID users because this would benefit all site visitors:

‘We have the potential to help all users, but unless a client has a specific requirement I doubt we will go further than mild/moderate. I think there are strong advantages to us doing this: by investigating what can be done to help this group of people we will improve our sites for everyone’ (Jane, corporate product development manager).

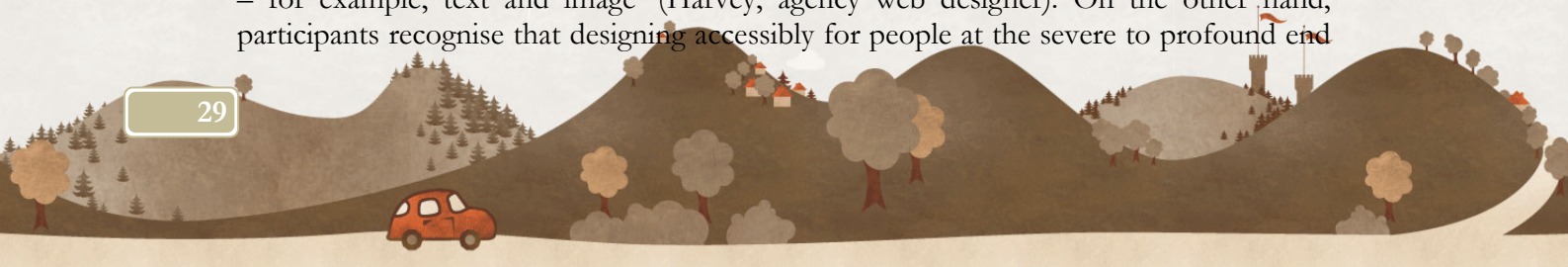
‘Meeting accessibility is essential for government depts..... I believe I only need to address mild accessibility needs as my target audience only consists of that’ (Ayesha, web developer for a government department).

‘In my current job it would really only be mild, as someone with a moderate ID would be unlikely to be in higher education’ (Vanessa, university web assistant).

When asked whether she intended to keep up her ID accessibility knowledge acquisition, one business owner replied:

‘Hmmm, I think I will only follow limited info. Time is never enough here even just to run the business and keep things ticking over, so the most important further reading for us is a) to make sure our web sites validate and tick all the right boxes and b) to make sure that they are accessible to business people and people who are likely to buy from the shops we build. That means our focus is on blind, physically disabled and less on ID. The main elements we will follow are the common sense ones where we try to make a site easy to use for anybody’ (Sofia, design agency director).

On the one hand, it is a positive sign that almost all of our participants left INMD with a commitment to ID accessibility and an understanding of how this can be achieved. One participant said ‘I design as simply as possible for the content. I encourage copywriters to write simply. I understand that using Rich Content is good for accessibility as a whole, which I didn’t before. I try to use as many media types/ resources as possible for design – for example, text and image’ (Harvey, agency web designer). On the other hand, participants recognise that designing accessibly for people at the severe to profound end



of the ID spectrum would be both costly and obtrusive to other users, and therefore not pragmatic to attempt. This means that the people with intellectual disabilities who are already most marginal members of society, because of the severity of their disabilities, remain at the margins; they remain excluded.

## 6. Recommendations: how to encourage ID accessible design

It is pleasing to note that one of the main findings of INMD is that accessibility has come to play a central role in the web design and development practices of an increasing number of web designers. This is in part a result of the efforts of the W3C's Web Accessibility Initiative and their development and dissemination of the WCAG guidance. Despite the criticisms of WCAG – that they are difficult to understand, lead to a tick-box culture and do not necessarily result in genuine accessibility – they have been successful in raising awareness of accessibility and what can be done to achieve it. Other factors have also influenced the rise of accessibility in web design practice, including: designers' own passionate commitment to an open and accessible web; their increasing concern with their own professionalism and a subsequent desire to standardise their work; changes made to design tools and evangelising about the benefits of accessibility by web design gurus. All of these have resulted in accessibility becoming an increasingly standard component of web design, albeit practiced to different degrees, in different contexts.

But building a genuinely inclusive and accessible website is not easy. INMD participants identified a range of barriers to achieving this, including attitudes of decision-makers, the nature of the projects they work on, limits to their own understanding about ID audiences and their web accessibility needs, and the lack of detailed specifications about how to engage this community of web users, in WCAG and elsewhere. This list suggests three things. First, that widely available resources detailing how web designers and developers can attend to the accessibility needs of ID users are needed. Second, that in order to achieve ID accessibility, action researchers like ourselves need to engage with other 'stakeholders' who influence the web design process. And third, because of a generalised lack of understanding of ID, engagement with people with ID by web designers, developers, and these other stakeholders of web design, is essential. This 'list' forms the basis of most of the recommendations of this research, which are outlined in detail below.

It remains to be seen whether participants on INMD will build websites that are more inclusive of intellectually disabled audiences as a result of their participation in the project. Their comments suggest that some of them, at least, might take some small steps to include people at the mild end of the spectrum (this is something that could be tracked in the future by evaluating the websites that they make). This can be seen as a modest achievement of INMD. But more needs to be done to include those people at the severe to profound end of the intellectual disability spectrum. This, then, is the final recommendation emerging from INMD.

### 6.1. Develop an online resource about ID accessibility



The absence of guidance and advice on how to build ID accessible websites suggests the need for an online resource on this topic. A comprehensive, multi-modal resource about ID accessibility should provide tips on how to build ID accessible websites, how-to videos, examples of both good practice and user interaction, and information about how to exceed WCAG success criteria in order to address the accessibility needs of people with ID. Given the significance attached to contact with like-minded peers and information sharing by INMD participants, such a resource should also facilitate community building amongst web professionals committed to maximising the accessibility of their websites.

## 6.2 Engage with intellectually disabled web users

The value that our participants attached to engaging with ID web users suggests that it is important to find ways of facilitating such continued engagement between web producers and ID web consumers. One suggestion about how to achieve this was to include information about how to access ID users for user-testing on an online resource. Some participants suggested that a more participatory approach to design than was adopted on INMD could be explored, where people with ID are engaged as experts in their own web use and therefore co-producers in the development process, not just as testers. This might result in more genuinely inclusive new media design.

## 6.3. Engage a diverse range of stakeholders

When we put INMD together, we assumed that web designers and developers were empowered to enable or disable web users through their design practice. We have found that the ‘webs of connections that make up the production of technical systems’ (Wakeford 2003: 241) are more complex and dispersed than we originally anticipated. Consequently, it is necessary for action researchers to engage with a more diverse range of stakeholders – line managers, copy writers, policy makers – in order to make ID accessibility happen. In order to design inclusively, we need to ask questions about who designers are and where power lies in design decision-making.

## 6.4. Develop research with people at the severe/profound end of the ID spectrum

People with severe or profound ID are an extremely marginal and excluded community. New media like the WWW present a wealth of opportunities for including them, yet the measures that can be taken to do so are perceived as obtrusive to other non-disabled web users. As a result, web designers and developers are more likely to cater for the accessibility needs of people at the mild end of the ID spectrum, and people at the severe to profound end remain excluded. More action research initiatives are needed, therefore, that address the digital inclusion of people at this end of the ID spectrum.

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