

SBRI Assistive Technology Competitions - Brief

JISC_Techdis_CompCode_002 Brief_Comp2

Plain sailing: easy, navigable and personalisable access to digital information

'For people with disabilities in and not in work, the ability to be digitally productive is important in respect of: **education and learning**, citizenship, health, lifestyle and family'

(Carey, 2009).

1. Summary

JISC TechDis, supported by BIS are launching an SBRI competition to fund development work on easy, navigable and personalisable access to digital information for learners.

Digitisation has opened up access to a mass of information for a vast number of people across the globe to an extent which less than a generation ago could not have been imagined. In spite of this and the implementation of legislation, accessibility standards and guidelines, equality of access is still denied to millions of people in the UK.

Despite the inherent flexibility of digital information there are still far too many scenarios where the end user finds digital information difficult to access, view, comprehend or navigate successfully. Hampshire Library service, a pioneer in reading groups for the disabled, considers online e-book systems too complex for older readers. Software used to render digital information often locks out the accessibility inherent in the underlying files.

Currently the enormous potential of existing technology is frustrated by a fragmented landscape of piecemeal solutions at both ends of the process i.e. text creation and text consumption. The right technology solution in the centre could not only transform access for learners but could also transform publishing/content creation enabling easy ways to create highly accessible output, knowing the tools will be in place for mainstream as well as specialist use. A recent "Accessible Resources Project" funded by DfE (teachernet, 2009) demonstrated a wide range of improved learning outcomes when learners had access to personalisable text resources. This success relied on interventions that are not easily scaled across the supply chain with current technologies yet the underlying principles are wholly replicable.

The aim of this competition is to ensure that users can produce and access navigable and personalisable digital information independently and spontaneously, anytime, anywhere, in an effective and user friendly way that does not undermine the legitimate requirements of rights holders.

The competition comprises of the following phases:

2. Initial application

Applicants outline their proposal, detailing how their proposed approach will meet the specified criteria and describe the technical work that will lead to a practical solution. Applicants must show that their proposed solution will enable users to effectively and efficiently produce and access digital information anytime, anywhere. Applicants should include in their plan for phase 1 how they will demonstrate proof of concept and an outline of their plan for phase 2, to develop a prototype solution. Due to the current economic conditions, applicants should note that funding for phase 2 may be subject to review.

Phase 1: proof of concept

Successful applicants will be offered a contract with 100% funding to show proof of concept of their research proposal. Cost-effective proposals are invited.

A total of £250,000 is available to fund 3 or 4 contracts for each competition and organisations that may be interested in entering can find out more information at www.jisctechdis.ac.uk/sbricompetitions.

The expectation is that the initial six months funding will be completed by 28th October 2011.

Subject to available funding successful Phase 1 applicants may be invited to compete for a Phase 2 contract to work toward development of a prototype device.

Individual companies or consortia may apply, and there is no limit on the size or type of company, but it must be a legal entity. We particularly welcome applications that enable small companies to participate within the supply chain.

3. Background and Challenge

There are 11 million disabled people in the UK (Office for Disability Issues, 2008) a high percentage of whom are likely to experience difficulties accessing digital information.

Between six and eight per cent of all web users use an assistive technology (Office for Disability Issues, 2008), however 57% of all web users aged between 18 and 64 are likely to benefit from using assistive technology (Microsoft/Forrester Research Study, 2003). That is 17.2 million people who use the Internet on a daily basis and 22 million people who have used it in the last three months.

The Right to Read alliance estimates that one in eight people have print impairments. Three million people in the UK are being denied the right to read on a daily basis just because they have a sight problem or reading difficulty (RNIB, 2010). There are many more for whom English is not their first language who would benefit from text and digital information being read out aloud to aid understanding.

At one end of a continuum a typical learner nowadays may be engaging in social networking, reading an e-book, shopping, accessing local or national government information or services, emailing, writing a report; dipping in and out of these almost simultaneously and spontaneously. At the other end of the continuum this type of engagement may be completely denied. Along the way there will be learners for whom accessing digital information will be difficult, a huge cognitive effort and extremely time consuming as well as lacking the pleasure experienced by others.

Studies on e-book access show some disabled users taking up to 40 times longer to access e-book content (Muir et al, 2009) compared to someone not using access technology. In some cases learners are not able to complete tasks at all. Even if a task is completed, aside from the extra time taken there is an additional cognitive load relating to energy expended in accessing the content and using the assistive technology.

These two aspects (time and energy) can have a significant impact on both the quality of, and satisfaction with, the learning experience. In some cases the learner might simply give up (Evans and Douglas, 2008). The right technology would significantly transform such experiences and offer people with disabilities access to exciting and spontaneous learning opportunities and therefore opening up their life chances.

4. Case Studies

4.1. Case Study 1

How it is

Marianne is 23 years old and a student studying English Literature on a distance learning on-line course. She has a motor impairment which means that she cannot use a mouse and accesses her computer using the keyboard. She is also dyslexic and prefers to access information by audio rather than to read it on the screen or print it off.

Marianne is at home writing an essay and she has been on-line discussing the assignment with some of her tutor group. One of her peers recommends a couple of books available from the institutions e-library that will be helpful. Marianne sets off to do some research. First of all she logs into her institution's virtual learning environment. She then navigates to the e-library area and searches for the resource. She identifies the e-collections where they can be found, two different collections. She then navigates to the first collection and logs in. Next she carries out a search for the book, finds it and opens up the book. She has taken almost 200 keystrokes to get this far. The e-book is not in a format that can be easily translated into a navigable audio file. She saves the file onto her desktop, converts it into a plain text file and then formats it to read later after she has searched for and downloaded the other book she needs.

In the meantime she has received an email alert. She is expecting an email from her tutor so she navigates away from the library into her email client and opens up the message. She invokes her text-to-speech-reader and finds that her tutor has recommended books other than the one she has downloaded. So far this activity has taken over 400 keystrokes and half an hour of her time and she has not even established whether she has the correct resources as she is not able to visually scan text. Such a range of activities for someone who does not need assistive technology could take less than five minutes.

4.2. Case Study 2

How it is

Arthur is blind with no residual vision and is self-employed as a masseur. He is studying part-time to enhance his qualification portfolio to include sports massage. With two lots of three hour exams due next week he is revising in-between seeing clients and during his two hours of train journey each day. He has converted pdfs of his books to MP3 and downloaded these onto his mobile phone. The books are up to 500 pages long and he is not able to quickly and easily navigate to specific sections or bookmark pages of interest.

If he wants to make notes he has to use his dictaphone. Alongside his massage equipment and his guide dog there is limited scope for him to transport additional assistive technology and/or carry around large amounts of braille. As a result he spends a significant amount of his time on his mobile fast forwarding to items of interest. Precious time when he should, if he could, like his fellow learners without disabilities, be focusing on learning

4.3. Case Study 3

The future: more than a level playing field

Lara is an educational consultant and spends much of her time travelling to meetings by train. Late last night she received an email and attached was a 40 page document containing important background information that she needs to know before she meets with clients today. She was out of the house at six am this morning to go to the station. Fortunately, as soon as she received the document last night she was immediately able to process it, together with some information from the client's website, and load it onto her mobile phone ready for her to work on it on the train on the way to the meeting. Her preferred method of working is on her laptop but this is frequently prohibited due to lack of space.

Whilst on the train she is able to easily navigate around the document by audio or visually; identify the information she needs and annotate it using her own voice or text input. During the meeting a blind colleague requests a copy of a document Lara has been referencing. She Bluetooth's the document from her mobile to his portable braille device. The document contains links to a recommended textbook he was considering purchasing. During the coffee break he goes online with his braille and purchases the book in order to read on the way home.

If only this mainstream technology were to exist what a difference it would make to the lives and life chances of Marianne and Arthur too!

5. Scope

The overarching outcome of the proposed technology development must ensure that users can produce and access navigable and personalisable digital information independently and spontaneously, anytime, anywhere, in an effective and user friendly way.

Ideas might include a piece of software or a downloadable application – we are looking for the most innovative solutions that will help offer a level playing field in terms of access to digital information. Simplicity, universality, sustainability, affordability and scalability sit at the heart of any solution. Solutions will take cognisance of the current state of play of accessible formats.

6. Specification

Points 4 to 8 are a fundamental requirement to achieve the required accessibility/usability functionality of the outputs from points 1 to 3.

1. Ensure digital information can be displayed to suit user preferences and that these preferences can be transferred across different environments. This should include a wide range of magnification levels (with automatic text reflow to fit the screen), font style, colours and contrasts. Text should also be capable of being output in other media for example audio, braille and ASCII.

2. Ensure digital information can be manipulated to enable meaningful navigation based on purposeful alternatives for example, section headings, chapters, hyperlinks.
3. Ensure digital information can be converted into a navigable audio file with the same purposeful navigation alternatives as in 2. above.
4. Hardware/software issues - must be capable of working on range of hardware devices for example mobile phones, desktop PCs, car media centres and portable media players. It must be straightforward to transfer from document / text format to navigable and annotatable audio and back to document/text format.
5. Usability issues - must be simple to use by default with additional complexities as an optional extra hidden unless required
6. Accessibility – it is recognised that accessibility will be influenced by the options available on the hardware and underlying operating systems but **wherever technically feasible** the tools should be accessible with keystrokes, a screen reader and voice recognition as well as have magnification and colour preference facility. In some cases this may mean making use of existing device features or via additional apps but regardless of how the functionality is facilitated ideally each of these accessibility functions should be available and verified as working as part of the overall solution.
7. Online/Offline usage - the solution should be capable of working in full or at least basic mode without online access and be cable of suitable synchronisation between mobile/laptop/desktop when the required connectivity is restored for example direct cable connection, Bluetooth, wireless and/or cloud synchronisation.
8. Usability/Help - contextualised help and guidance on how to use and make the most of the hardware/software combination should be built in and provided in both textual and audio/visual formats. Help should be age appropriate and fit for purpose.

7. Application Process

JISC TechDis, supported by BIS and the Technology Strategy Board are running this SBRI competition. SBRI is a mechanism for government departments to find novel solutions to specific problems by engaging innovative companies they could not otherwise reach. This open and transparent competition will result in direct contracts between successful companies and JISC TechDis.

7.1. Key Dates

Competition Opens	10 th January 2011
Deadline applications	Noon, 15 th March 2011
Notification of decision	21 st April 2011
Contract awarded	by 6 th May 2011
Work begins - PID agreed / signed off	16 th May 2011

Contract complete

28th October 2011

Directions on how to enter this competition and key dates and timelines can be found in the Invitation to Tender (JISC_TechDis_CompCode_001 Invitation to Tender_Comp2) and the Guidance Notes (JISC_TechDis_CompCode_003 Guidance_Comp2) available at www.jisctechdisc.ac.uk/sbricompetitions/apply/download-application

More information on this and other competitions may be obtained at www.innovateuk.org.uk

8. References

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