Jutta Treviranus: Background for ECM

Short Biography:

Jutta Treviranus is the Director of the Inclusive Design Research Centre (IDRC) and professor in the faculty of Design at OCAD University in Toronto http://idrc.ocad.ca . With it's origins in the ATRC established in 1993, the IDRC is an internationally recognized center of expertise in the inclusive design of emerging information and communication technology and practices. Jutta also heads the Inclusive Design Institute a multi-university regional centre of expertise. Jutta has led many international multi-partner research networks that have created broadly implemented technical innovations that support inclusion. Jutta and her team have pioneered personalization as an approach to accessibility in the digital domain. Her team also leads many international open source projects that attempt to infuse inclusive user experience design sensibilities into open source networks. She has played a leading role in developing accessibility legislation, standards and specifications internationally (including WAI ATAG, IMS AccessForAll, ISO 24751, and AODA Information and Communication). Jutta established and directs a graduate program in Inclusive Design at OCAD U. She is also a member of a number of key advisory panels nationally and internationally that advance approaches to equitable access to the digital domain.

Work in the field of accessibility:

As indicated in my biography I have worked in the field of accessibility for more than 30 years. Since the emergence of personal computers I have conducted research and development, policy development, educationanddirect service to ensure that computers, networks, digital content and applications are accessible to people with disabilitiesand to harness computers to address accessibility barriers faced by people with disabilities. My work has been cross-disability. Although my work has been in all domains where technology is applied, a strong focus has been on accessible education and authoring environments to support the creation of accessible content and applications.

Where we stand:

Access to digital systems and networks is now essential. Education, employment, access to culture, civic engagement, commerce and government services, all involve the use of digital systems and networks. In the "western world" we assume that mainstream technologies can be designed for the typical user and that specialized assistive technologies will bridge the gap for anyone that cannot use the mainstream technologies. This is a flawed assumption and has led to an ever-widening technology gap or a gap between the access experienced by those who can use mainstream technologies and those who require alternative access systems.

The assistive technology industry is not technically or economically viable. As standard technologies decrease in cost, increase in functionality, availability,

reliability and diversity; assistive technologies in contrast, increase in cost, and decrease in functionality, reliability and diversity. Assistive technologies are also not available in most of the world. In the majority of countries they are either not sold, not maintained or cost more than 50% of an individual's annual income. Adequate assistive technologies do not exist for some of the most prevalent disabilities, namely cognitive access.

A specialized market of assistive technologies is not technically viable because, to successfully fulfill the role, each technology must be fully compatible and remain fully compatible with all applications on a given platform. Many of these applications are proprietary and do not share interoperability specifications at the level that assistive technologies require. Updates and upgrades to the applications happen frequently and are increasing in frequency as these can be done automatically over networks. Most updates or upgrades require a responsive update in the assistive technology. Many applications are now constructed by many sources, meaning there is no one mainstream developer to appeal to or to seek information from. Consequently a user of a screen reader, onscreen keyboard, or screen enhancer cannot assume that they can access all functions of essential applications or that if they can today, that they will be able to tomorrow.

With the aging of western populations and improved survival rates globally there is an increase in the incidence of people experiencing disabilities. Special services intended to provide funding for assistive technologies, and training in their use, are experiencing greater demand, at a time of financial constraint in almost all jurisdictions. The response has been to tighten the criteria that must be met to qualify for these services. As a result, an increasing amount of the budget is spent on policing or excluding individuals (that are deemed not to qualify) from the service, leaving a smaller amount of the budgets available to provide the service. This causes groups of individuals to be excluded from the service. These individuals then advocate for service, this may result in a new category of service which requires further administrative processes to administer and police (e.g., services for individuals with autism). In addition the technologies funded through the special programs must be certified. This certification process frequently takes longer than the updates to the technologies meaning that an individual who has successfully passed the qualification requirements may be provided with an outdated assistive technology.

Legislation has been seen as a means of addressing this gap. Legislating in a domain that advances as quickly as ICT is a difficult process. Legislation requires clear, testable criteria. The life cycle of legislation is far far slower than the speed of technical advances. Consequently accessibility legislation is frequently seen to constrain technical innovation and advance. Developers who want to innovate will often respond to accessibility legislation by attempting to find ways to be exempt from legislation rather than finding creative ways to address accessibility requirements.

Clearly we need new approaches. Addressing digital inclusion of individuals with disabilities as a specialized, segregated goal is not viable. The digital inclusion agenda for people with disabilities is becoming ever more urgent as we move more inexorably into a networked, digital society globally.

Major Barriers

As discussed above in "Where we stand" the major barriers in this domain are:
- mainstream development does not take into account the needs of individuals with disabilities, relegating the responsibility to assistive technologies,
- under current technical and economic conditions, specialized assistive technologies are not technically or economically viable (with very few exceptions) and are not available in most of the world,
- specialized services for individuals requiring alternative access systems are experiencing greater and greater demand at a time of fiscal restraint, meaning that individuals with disabilities must pass ever more stringent qualification processes to receive ever more taxed services, and
- legislation intended to enforce accessibility is frequently seen to be at odds with technical innovation and advance, in an area where technical innovation is badly needed, and
- most legislation is based on litigation for enforcement meaning that individuals with disabilities who are very poorly resourced need to mount a legal case.

Successful Use Case and Learning Points

Case Study 1: FLOE Project and Open Education Resources

Background:

The growing Open Education Resource (OER) community globally produce openly licensed learning resources for all levels of education and all subjects. The community is supported by grants from a number of large foundations including the William and Flora Hewlett Foundation. Contributors of OER include prestigious Universities such as MIT, Stanford, Berkeley, Princeton and others through initiatives such as Open Courseware. Unfortunately the majority of resources are not accessible and there are few supports or mechanisms within the community to produce accessible resources despite the goal of inclusive education. OER delivery mechanisms are also not accessible. This presents an impediment to adoption by education systems that require accessible curriculum.

Objectives:

The primary objective of Floe is to support inclusive education for the full diversity of learners and to support OER producers in creating inclusively designed OER.

Process of Strategy:

The FLOE project is sponsored by the Hewlett Foundation to address the accessibility of OER and to thereby remove barriers to adoption of OER by formal education systems and serve the needs of currently marginalized learners. However the project was initiated at a time when there were over 30 million OER, the majority of which were inaccessible. The traditional approach to accessibility would have been to evaluate and retrofit all existing resources and then support the creation of accessible resources by OER producers in the future by setting up training and specific accessibility gates for new OER. This approach was deemed to be impossible and counterproductive to inclusive education which recognizes that learners learn differently.What is needed is a one-size-fits-one approach to learning not a one-size-fits-all approach. Consequently FLOE approached the problem by assuming that all learners learn best when the learning experience is tailored to their needs and takes their constraints into account. To accomplish this personalized learning approach requires a large pool of diverse learning resources that can be modified, reused and repurposed and learning delivery systems that can be reconfigured to the needs of each learner. The large pool of openly licensed resources of the OER community are a perfect environment to enable this personalized learning approach.

Rather than retrofit each resource to adhere to a fixed set of accessibility criteria, FLOE created a system whereby the large, diverse pool of freely modifiable

resources could be used to address the diverse needs of each learner.

To achieve this requires:
1. information about each learner's access needs,
2. information about the learner needs addressed by each resource,
3. resources that are amenable to transformation, and a pool of alternative equivalent resources, and
4. a method of matching learner needs with the appropriate learning experience

The FLOE project has created a set of tools and resources that:

- support learners in discovering and declaring what their needs and preferences are with respect to learning, or how they learn best,
- support OER producers in creating transformable resources,
- label existing and new resources with information about what learning needs and preferences the resource addresses and a mechanism for augmenting or refining this information with feedback once the resource is used, and
- find and deliver resources that match each learners needs.

If the default OER is inaccessible to a specific learner the FLOE delivery system will either:
- transform the resource (e.g., through styling mechanisms),
- augment the resource (e.g., by adding captioning to video), or
- replace the resource with another resource that addresses the same learning goals but matches the learner's specific access needs.

FLOE implements the ISO 24751 standard for both the learner needs and preferences and the resource description. These FLOE tools and resources are being integrated into existing OER delivery systems such as OER Commons.

Changes or Progress Achieved:
One of the main changes achieved by FLOE is a shift in the attitude of the OER community towards accessibility. Prior to FLOE, in part due to exposure to a zealous group of accessibility advocates and threats of legal action, accessibility was viewed with wariness and defensiveness. Accessibility was seen as something that would constrain innovation and freedom of expression, it was seen as a rigid set of criteria that would homogenize resources, and as a legalistic set of constraints that imposed the requirements of a few learners on all learners. Since FLOE there is an enthusiastic, cooperative attitude toward accessibility as a means of benefiting all learners and furthering the foundational goals of the OER community. This can be seen in the online discourse and in the integration of accessibility into most OER efforts.

More practically FLOE has created a means of addressing the needs of learners with disabilities – both learners that fit classic criteria of disability and learners that do

not fit the categories but are marginalized or experience disabilities nonetheless.

Monitoring and Evaluation:
FLOE outcomes are monitored and evaluated by the William and Flora Hewlett Foundation, through graduate research projects, but primarily by the community of end users through the FLOE Wiki which solicits feedback and inputto help to refine the program.

Learning points:
FLOE integrates the needs of individuals with disabilities into the needs of all learners. The same design criteria that address the needs of learners with disabilities also benefit all learners.

FLOE goals are in line with the larger values of the community and appeal to the mission of the OER effort rather than acting as a counterpoint that highlights mistakes or omissions on the part of the community.

FLOE tools support curriculum developers to integrate inclusive design right from the beginning rather than after the fact and make the full rationale of the inclusive design practices apparent.

FLOE recruits a large and diverse group of contributors through crowd sourcing thus educating and including a broad community that would not otherwise know of or be concerned with accessibility.

Potential Improvements:
If FLOE had been initiated at the beginning of the OER effort, OER delivery mechanisms would have been built from the start to integrate the FLOE functionality.

Other lessons learned:
The binaries of disabled and non-disabled, accessible and inaccessible are not useful in the education and elearning domain. They only serve to exclude learners who don't fit the definitions but experience barriers from necessary services and to dismiss resources that, although they don't fit the fixed definition of accessible are nonetheless the most accessible to certain learners. Both disability and accessibility should be seen as relative terms taking into account the learning goal, the individual learner and the context, not as a personal trait but a condition brought on by a mismatch or match of the learning environment or service with the current needs of the learner.

Relevant References:
1. http://floeproject.org

2. http://www.hewlett.org/programs/education-program/open-educational-resources

3. Treviranus, J. (2010). The Value of Imperfection: the Wabi-Sabi Principle in Aesthetics and Learning. In Open ED 2010 Proceedings. Barcelona: UOC, OU, BYU. [Accessed: 10/1/2011].<http://hdl.handle.net/10609/4869>

Contact Details for Further Information:
http://floeproject.org and http://wiki.fluidproject.org/display/fluid/Floe

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Case Study 2: Fluid Support for Accessible Web Application Development

Background:
Creating accessible interactive Web Applications or Rich Internet Applications present some of the greatest Web Accessibility challenges for which it is very difficult to create prescriptive guidance. Most Web Applications are created using component toolkits such as Dojo, JQuery and GWT which provide reusable components for most common interactions or functions, few Web application developers create applications from scratch. Web application designers frequently use design pattern, persona, scenario, and unit test libraries and other shared resources when designing and developing Web applications.

Objectives:
One of the primary objectives of the Fluid Project is to ensure that mainstream Web applications are accessible from the start.

Implementation Process or Strategy:
Fluid produces highly usable, fully accessible, reusable components and design resources and contributes these to popular component toolkits and design libraries so that Web application developers using the toolkits create accessible applications by default. Fluid is a growing open source community. Implementers of the Fluid components help to extend and add to the Fluid components. The initial motivation for using Fluid components is usually because they are well designed, reliable, robust, well documented and easily updated. Accessibility is initially seen as an added benefit. In the process of using Fluid the developer is also educated about accessibility needs and the benefits of accessible design.

Changes or Progress Achieved:
Fluid components and design resources have been integrated into over 100 IBM applications, popular browsers such as FireFox and many open source applications such as Sakai, UPortal, CollectionSpace, OpenCast to name just a few. All of these are therefore screen reader compatible, keyboard accessible and provide the necessary ARIA markup (WAI Accessibility for Rich Internet Applications).

Monitoring and Evaluation:
Fluid is monitored and evaluated by a growing community of implementers and by

the toolkit or design library initiatives they are integrated into, which have stringent standards for integration.

Learning Points:
Fluid's success can be attributed to the fact that accessibility comes as an integrated part of a number of other desirable goals. Developers use Fluid components because they are well designed, reliable, upgradable and they are then pulled into the effort of maintaining and improving the components.

Because Fluid functions as a largely transparent effort there is less public and financial support than a high profile accessibility effort.

Possible Improvements:
Greater effort can be expended to publicize the Fluid project.

Other lessons learned:
One of the most successful strategies for compliance with accessibility guidelines is to build supports for accessible authoring into the authoring tools and development tools. This ensures that even individuals that are not motivated or not knowledgeable about Web accessibility will adhere to accessibility guidelines.

Relevant References:

http://fluidproject.org

Treviranus, J. (2009)"You Say Tomato, I Say Tomato, Let's Not Call the Whole Thing Off "in *On theHorizon.*Emerald Group Publishing Limited.

Treviranus, J. (2008), "Authoring Tools," in *Web Accessibility: A Foundation for Research.*.Editors: YelizYesilada and Simon Harper. Springer, Hamburg

http://www.w3.org/WAI/intro/aria

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Case Study 3: Accessibility for Ontarians with Disabilities Act (AODA)

Background:
Most accessibility legislation globally requires that the wronged party, namely the person with a disability mount a legal process and litigate the offending institution or individual. This puts an undue burden on individuals who are frequently poorly resourced. It also puts the onus of proof of wrongdoing on individuals with

disabilities.

Objectives:
To shift the burden of achieving equal access onto the provincial government and all organizations in the province of Ontario.

Process or Strategy:
The AODA treats accessibility and compliance to accessibility regulations the same way that environmental regulations or public health regulations are treated. Both public and private organizations are required to report compliance and the province inspects and audits compliance and administers fines to organizations that do not comply. Individuals with disabilities help to set the standards but are not required to litigate. People with disabilities still have the option of litigation through human rights legislation.

Changes or Progress Achieved:
Responsibility for enforcing and upholding compliance is the responsibility of the government. All obligated organizations are held accountable for compliance and must report on their progress on a regular basis. This shifts accessibility compliance within an organization from a risk management issue (assessing the risk of litigation against the cost of compliance) to an organizational requirement.

Monitoring or Evaluation:
An independent consultant (Charles Beer) evaluated the success of the program. This will be repeated on a regular basis.

Learning Points:
Disability representatives and advocates were empowered to actively participate in the standards development process through research and training support. All political parties supported the Act.

Possible Improvements:
More transparent reporting of compliance (through online systems) and public review of compliance reports would speed up compliance and monitoring.

Other Lessons Learned:
The presence of accessibility legislation in the full range of domains is more powerful than the specific requirements of the regulations. Organizations are motivated by the fact that they are required to become accessible and frequently don't become sufficiently informed about the actual requirements of the legislation.

Relevant References:
http://www.mcss.gov.on.ca/en/mcss/programs/accessibility/

http://www.aodaalliance.org/

Kemper, A., Stolarick, K., Milway, J., Treviranus, J., (2010) Releasing Constraints: Projecting the Economic Impacts of Increased Accessibility in Ontario. Martin Prosperity Institute. http://www.martinprosperity.org/media/ReleasingConstraintsAccessible.html

Contact Details:
http://www.mcss.gov.on.ca/en/mcss/programs/accessibility/

Key Recommendations

Governments
1) Accessibility should be regarded as a regulatory responsibility of the government just as public health, environmental regulations, traffic regulations are enforced and monitored by the government.
2) Public policy regarding digital inclusion should be established in such a way that it outlives the political term of any one government and is not vulnerable to political changes.
3) Governments should set an example with respect to accessibility and institute accessible practices in all internal areas of ICT, through mechanisms such as accessible Web templates, authoring tools that support accessible content creation and the adoption of open standards and accessible file formats.

UN
1) The UN should support a global shift in policy and legislation that requires that mainstream software and hardware manufacturers are responsible for addressing the needs of individuals with disabilities rather than relegating this to assistive technologies. This will shift the rising cost of alternative access systems from people with disabilities and the public purse to the corporations, it will increase the availability of integrated access solutions and it will increase cooperation between mainstream developers and developers of assistive technologies.
2) The UN should mount an effort to support open standards. This will support greater interoperability with alternative access systems.
3) The UN should support the convergence of mobile and internet technologies. This will reduce the fragmentation and redundancy in standards, training, maintenance and accessibility strategies.

International standard organizations
1) Accessibility should be an integrated consideration in the development of all interoperability or technical standards.
2) There should be greater representation of people with disabilities in standards organizations.

3) Standards should be developed as open standards to allow interoperability with alternative access systems.

Corporate sector
1) Corporations should design for requirements at the margins rather than or the average user, this promotes innovation and increases the customer base.
2) Corporations should create flexible, easily reconfigurable ICT products, this will help with upgrading and will increase the longevity of products and services.
3) Software producers should provide open APIs to increase interoperability and thereby also increase the uptake of their products.

Disabled persons organizations
1) Organizations should collaborate and cooperate and avoid fragmentation and publicly dissenting opinions.
2) Organization should focus on long term cultural change rather than short term gains and requirements.
3) Organizations should develop the capacity to understand advances and directions in ICT systems and practices so as to take proactive action.