

Prosperity4All – Designing a Multi-Stakeholder Network for Economic Inclusion

Jutta Treviranus¹, Colin Clark¹, Jess Mitchell¹, and Gregg C. Vanderheiden²

¹Inclusive Design Research Centre, OCAD University, Canada

²Raising the Floor Consortium, Switzerland

{jtreviranus, cclark, jmitchell}@ocadu.ca,
gv@trace.wisc.edu

Abstract. People with disabilities are disproportionately affected by systemic global economic problems such as digital exclusion, income disparity, unemployment and poverty. The Prosperity4all project, an international consortium supported in part by the European Union FP7 program, is seeking to address the economic exclusion of consumers and producers at the margins, including people with disabilities. This article discusses the economic or business design models being considered in this emerging initiative. Like the work that the platform supports, the platform itself must be designed for diversity.

Keywords: inclusive design, value chains, user experience, accessibility.

1 The Economic Backdrop

The global economy can be characterized as being in a state of fragmentation and polarization. Much attention has been paid recently to income disparity and the demise of the middle class. Similar patterns can be seen throughout the economic ecosystem affecting more than income but also supply, opportunity, education, employment, access to financial instruments and other essential factors of economic inclusion (1). Fragmentation and polarization lead to redundancies, waste, debt and socially untenable inequalities. While global networks can exacerbate or amplify these vicious cycles, they may also provide a mechanism for addressing these challenges by providing an opportunity to connect, pool, share and repurpose resources thereby reducing redundancy, waste and debt; and also spurring sustainable and resilient innovation.

Like many crisis, people at the margins (most notably people with disabilities) are most profoundly affected. The Prosperity4All project hopes to provide a platform that connects consumers at the margins with producers and suppliers at the margins, thereby addressing the complementary barriers they each face. It is hoped that the platform will support an economically viable means of addressing the diverse “markets of one” that most people with disabilities represent.

1.1 Digital Exclusion

Our society is undergoing a disruptive transformation caused by global networks and digital technologies. Accessing online systems is no longer an option for participants in most societies. The social and economic impact of digital exclusion is well articulated in international policies and initiatives on the digital divide [2]. The social and economic costs of digital exclusion are mounting as more and more essential daily activities are mediated digitally (estimated at 55.2 billion a year in the US) [2]. However many of the projections do not take into account the additional technology gap for individuals who cannot use standard ICT systems and resources due to disability, age, language or lack of literacy.

Digital technologies, like most consumer goods, are designed for the average or typical consumer. Specialized accessibility technologies (AT) are intended to bridge the gap between standard technologies and the alternative access requirements of people with disabilities. The small companies that produce these systems have the impossible technical challenge of interoperability with a broad range of rapidly changing technologies. The technical strategies AT developers rely upon will cease to work as software applications inexorably shift to new component-based, distributed paradigms. What assistive technologies exist, are available in only 28% of the world. In most countries they are not sold, maintained or they cost more than 50% of an individual's annual income [3]. While most information and communication technology is going down in price and increasing in functionality, reliability, diversity and availability, most AT is increasing in price and decreasing in functionality, reliability, diversity and availability. The cost of "getting online" for consumers requiring assistive technology is up to ten times the cost when compared to consumers using standard, mainstream systems. Individuals with disabilities are three times more likely to be among the digitally excluded. This means that people with disabilities are not able to be "at the table" when mainstream services are designed, which means they are less likely to be considered in the design. This all leads to barriers of access to education and employment and thereby greater poverty. This makes it even harder to catch up with a quickly changing digitally-mediated world. Against this economic backdrop, the incidence of disability is increasing globally, due to aging and better survival rates from natural and man-made disasters. The incidence of disability increases sharply with aging -- from less than 15% under the age of 25 to more than 64% over the age of 75 [3].

2 Background Work in Personalized Inclusive Design

Within this growing crisis lays both a challenge and an opportunity. Global networks profoundly change the mechanisms of production and delivery. Digital resources are highly mutable. There is a growing awareness of the catalytic and accelerant qualities of global networks and crowdsourcing. Whether it is engaging gamers to catalog the ways a protein can be folded, enlisting citizens to comb through seemingly endless government expense reports, or recruiting global support for political change, global networks have unleashed a new magic that makes the overwhelmingly impossible,

possible, enabling initiatives to realize effects that far exceed available resources or human capacity [5].

This network effect makes it feasible to use networked, collective production to deliver personalized or one-size-fits-one resources and configurations to currently marginalized consumers [4]. For the past 15 years a nascent but growing global consortium has been iteratively refining infrastructure, tools and implementations that enable one-size-fits-one online configurations and resources, on demand, to enable digital inclusion of currently marginalized users. The multiple iterations of this innovative functionality support the consumer in discovering their diverse individual needs and preferences and expressing these in a machine-readable form (using the ISO 24751 or AccessForAll standard). The networked system then reconfigures, augments or replaces resources and interfaces to match these needs and preferences. This functionality has been piloted in education, government online, public access stations, libraries, mobile commerce and other networked contexts. Projects include Web4All (<http://web4all.ca>), TILE (<http://inclusivelearning.ca>), FLOE (<http://floeproject.org>), and Cloud4All (<http://cloud4all.info>) and most recently Prosperity4All (<http://www.raisingthefloor.org/prosperity4all/>). With the emergence of cloud technologies the initiatives have moved to the cloud and are coordinated through a global consortium called the Global Public Inclusive Infrastructure (<http://gpil.net>).

3 Prosperity4All

Prosperity4All (P4A), a multi-partner, multi-sector international initiative, supported in part by the EU FP7 program [6], is the most recent iteration of the GPII initiatives. P4A hopes to address the needs of marginalized suppliers and producers as well as consumers. The project hopes to harness the global network effect to connect consumers at the margins with pooled resources, and if the resources or user experience configurations don't currently exist, with producers and suppliers at the margins who can address those needs. In this way P4A will provide "what you need, when, where and how you need it" to consumers, while also supplying "work where, when and how you can" for currently unemployed or underemployed workers including youth and people with disabilities [4]. P4A is constructing a multi-sided platform that will support the economic viability of addressing marginal consumer needs and thereby provide work for individuals who face barriers to financial independence.

3.1 Aggregating Demand

P4A and the associated projects coordinated by the GPII are aggregating a growing number of resource gaps or unmet needs from consumers with disabilities and organizations that serve these consumers. Example demands to be filled include captions and descriptions for videos, graphics and audio (for users who are deaf, blind, hard of hearing, or individuals with low literacy levels), file transformations to convert files to screen-reader accessible formats, alternative controls for applications, simplified instructions or demonstrations, applications to provide guidance and better cognitive

access, customized casings for mobile devices, tailored grips and handles suitable for manufacture on 3D printers, to name just a few.

This demand is heightened by accessibility legislation in many jurisdictions, including the more than 150 jurisdictions ratifying the UN Convention on the Rights of Persons with Disabilities [7]. These policies or legislative requirements mean that a large number of organizations and businesses must comply with accessibility criteria. This then casts these organizations as consumers of accessible products.

3.2 Supporting Suppliers and Producers

These gaps are being filled in part by crowdsourcing through services such as Amara (<http://www.amara.org>), however, there remain a growing number of unmet needs. In preliminary trials youth (the group that faces the largest unemployment rates) seem ideally suited to address this gap. As “digital natives” they are more at home in a networked environment developing digital or digitally-mediated resources. The aggregation of demand and other services and resources provided through the multi-sided platform (e.g., training, development tools and resources, accessible building blocks and templates), support the emergence of personalized accessibility or inclusive design as a viable industry for producers and suppliers who face barriers to market entry, as well as youth seeking employment and financial independence.

3.3 Growing a Viable Personalized Accessibility Market Platform

P4A proposes to develop and support the growth and propagation of a globally disbursed demand-driven ecosystem that can sustain “markets of one” as well as mass customization value chains. The platform will connect diverse and distributed consumers at the margins with diverse and distributed producers and suppliers at the margins using supportive cloud infrastructure. The goal is to enable the diversification of demand by enabling each consumer to discover, refine and express their unique individual needs thereby prompting a diversification of supply and triggering greater innovation within the market [8].

As with all multi-stakeholder networks this requires a gardening or organic approach rather than an engineering approach. The project can only create the optimal conditions, plant seeds, monitor and encourage growth and then judiciously prune and graft where necessary. As with most network-dependent market platforms, the majority of the work is done by individuals, organizations and processes external to the project and outside the control of the project. As such there is far greater risk than with traditional applied IT projects, but also the potential for far greater impact and return on investment. As many of the factors that influence this ecosystem will be external and unpredictable, an agile, responsive design approach is needed in developing and “gardening” the network infrastructure and supporting systems.

While “markets of one” have existed in the pre-industrial era (e.g., cottage industry) and at the fringes of current markets (e.g., bespoke or custom services) they have not existed at the scale proposed and there have been no concerted attempts to directly address marginal demands or to engage currently marginalized suppliers or producers.

The hope is to leverage networks, pooling and sharing to make this new industry viable for both the consumers (who frequently live below the poverty line), and producers or suppliers. P4A hopes to create a virtuous cycle that ultimately enables full participation of individuals with disabilities in the economy as both consumers and producers. This participation will help to promote a more inclusive design of market and economic processes that will, in turn, enable more inclusive participation [8].

3.4 Economic Models for Prosperity4All

P4A proposes to create a complex multi-stakeholder network or a multi-sided platform as described by Hagui and Wright [9], but with an unprecedented diversity of products. As such traditional network effect analysis, standard market simulations and economic modeling will not prove helpful without significant adjustments.

P4A will create market models and simulations at both a macro and micro level to determine optimal designs for infrastructure and to determine the impact of market inputs. The full spectrum of ICT design, development and production will be explored from mainstream to specialized, from enterprise to Indie - recognizing that the binary distinctions of mainstream versus assistive technologies are permeable and fuzzy and become ever more so. The intention is also to create a highly permeable and dynamic global market; however to grow or achieve this requires sufficient critical mass or “heat” within a cluster of positive or successful interactions, which may be local. As such, a variety of economic or business analysis tools must be applied, some not yet designed.

The values or principles and design criteria to be achieved in this modeling include, to: a) protect consumer privacy, b) ensure that the services supplied are affordable, c) enable producers and suppliers to create viable businesses, d) encourage innovation, e) support diversification of both supply and demand and discourage a winnowing of demands and products, commensurate with the diversity of users, f) facilitate transparent feedback loops and reviews, and g) support continuous renewal and organic growth of the platform.

3.5 Challenges for the Multi-stakeholder Network

All network platforms face a number of common challenges [10]. These challenges include:

- the “mutual baiting” or “chicken and egg” problem – producers won’t come to the platform without consumers and vice versa
- the “ghost town” problem – a platform is initially without activity – neither producers nor consumers are attracted to an inactive platform.
- the double or multiple company problem – it is very difficult to serve both the producers and consumers, or all stakeholders, well at the same time
- the critical mass problem – the value of the network cannot be achieved until there is a critical mass of consumers and producers to achieve an acceptable set of successful interactions

Within the project team the design challenges have been described using a party metaphor. The primary value for partygoers is the people they might meet at a party, or the social interactions they may have. In keeping with the metaphor, to launch a successful “party” you must answer a number of questions: What will attract people to the party? What will keep them at the party until the people they want to meet there get there? What are the conditions that will ensure they have a successful interaction, are satisfied with their experience and will come back? What will prompt them to tell their friends about the party so that more people will come? How do you ensure people’s safety and deal with problems, issues or complaints that arise? How do you make sure people behave at the party without being too constraining so that you spoil the fun? These questions will also guide the evaluation of the project.

Potential Stakeholders. The stakeholders or “partygoers” include a highly diverse group of potential participants that would either require inclusively designed services or products; would have services or products to offer, share or refine; would help to finance interactions; would offer training, quality assurance or certification; or, benefit from the aggregated data supported by the platform to shape policy.

Each stakeholder will have diverse motivations or incentives for using the platform. The design team must identify potential successful value chains or interactions that can occur on the platform or at the “party”. As this party is occurring online and all interactions are digitally mediated each of these interactions requires highly usable and accessible user experience designs. To maintain the principle of personalization that P4A is founded upon, these user experiences must transform to match each user’s needs and preferences.

Addressing the “Chicken and Egg” Challenge. Two-sided or multi-sided markets require synchronization of producers and consumers coming onto the platform for interactions to happen. Since getting both sides in sufficient numbers simultaneously is difficult to execute, one potential strategy is to design staging processes. To achieve this staging until the requisite critical mass is reached frequently requires a supply proxy or a demand proxy. Candidate supply proxies in P4A include preference discovery interactions in which the standalone value proposition for consumers is the discovery and refinement of individual needs and preferences and an understanding of what works best for them with respect to content and user interface design. Most users find increased self-knowledge or self-awareness highly motivating and valuable. This can be in the form of games, simulations or utilities that enable the adjustment of a variety of settings or configurations. Examples of these configurations could be volume of audio, contrast adjustment and magnification of visual information, structure for text, size and spacing of targets and input fields to enable accurate control, supports such as glossaries or spelling and grammar aids, disambiguation routines that provide word or phrase completion, captions, descriptions, layout options, text translators or simplifiers, to name a few. Consumers could be guided in exploring possible configurations and then testing to see whether they are able to achieve tasks more

proficiently with the chosen configuration. The refined configuration then serves as their preference file when requesting resources or services on the platform.

Demand proxies for potential suppliers and producers can include development toolkits, component libraries, training in inclusive design practices or information regarding potential demands. Suppliers and producers may also find the opportunity to create an online profile of their services or competencies as an incentive to “come to the party.”

Addressing the “Ghost-town” Challenge. Strategies for attracting producers and consumers to an inactive platform or ghost-town include a variety of incentives, signals of relevant activity, participation by high-profile consumers or producers, access to functionality that has value whether or not the platform is currently active. One strategy being considered is to enable full, highly successful, demand-supply interactions and to grow organically from these successes. This is far more promising than a “waterfall” approach in which all development is completed for the full set of expected users and potential requirements before the process or “party” is launched. One problem that has received a great deal of negative press and is therefore seen as an urgent need is the lack of access to essential government documents by people with print impairments. The candidate interaction cycle might therefore be the conversion of these critical inaccessible PDF documents within a government service to accessible, personally configured HTML5. This would engage consumers with print impairments who require access to important government documents; government agencies that must comply with accessibility regulations and are obligated to provide access to these documents for clients/citizens with print impairments; potential service entrepreneurs such as unemployed youth who can be trained in conducting the conversion to accessible HTML5 and then supplying these converted documents; interaction designers who create interface configurations that meet the needs of the consumers with print impairments; and, quality assurance reviewers. The success of this interaction can then be used to attract other requirements and develop a reputation for successful services. The “story” of this successful value chain would be broadly publicized and high profile users would be recruited to participate in telling the story.

Addressing the “Multiple-Company” Challenge. Partners within P4A have significant experience in articulating and addressing the needs of marginalized consumers and less expertise in addressing the needs of producers whether these producers are marginalized, part of the mainstream, suppliers in specialized markets, volunteers or consumers themselves. The design team will create an engaging process whereby feedback, suggestions and “if only” statements can be garnered from various stakeholders, such that these participants or “party-goers” can be co-designers of the user-experience. A large challenge is to find an incentive for these stakeholders to provide this design input. One strategy is to use an interior design metaphor, enabling the supplier or producer to configure, personalize and decorate their “online office”. This would include choosing a set of services and tools. One key to sustaining engagement by all stakeholders is to encourage the sense of ownership and personal investment.

Addressing the Critical Mass Challenge. The critical mass challenge is overcome by constructing a successful demand supply loop. This then sparks further interactions and successful transactions. Like the approach to addressing the “ghost-town” challenge, the team will explore possible ways to “jump start” transaction loops to achieve the critical mass needed to organically address the diversity of demands expected to be addressed by the platform.

3.6 Value Chain Modeling

The design team will use available economic modeling tools to identify potential value chains, recognizing that these will be starter sets and that new possibilities will emerge from the larger community of stakeholders. Possible models include Porter’s Cluster model updated to take into account Downes’ new forces (Digitalization, Globalization and Deregulation) [11]. These models will help to identify the value proposition for participants in both the demand and supply side. The models will identify potential workflows and inputs required to successfully link specific demands to the appropriate supply, as well as mechanisms of feedback, refinement and resulting correction or adjustment. The team will identify market-ready services and services that are not yet market-ready and the supports needed to enable the maturation of these services. Necessary inputs such as training, incubation, investment, etc. will be identified. The models will also be used to identify factors that result in the greatest impact. Emerging value chains include 3D printing of device casings, handles and grips for people with arthritis, or organizers and labels for people experiencing forgetfulness associated with dementia. Well-established value chains include captioning, translation and description of educational videos.

3.7 Global Solutions Networks

The P4A team will be aided in this by the Global Solution Networks (GSN) effort led by Don Tapscott [12]. This research effort will help to evaluate the success of P4A. P4A fits the criteria for a global solution network as defined by the GSN in that it has diverse stakeholders, extends beyond a single nation state, leverages open networks and has progressive goals. P4A fulfills many of the functions the GSN has identified as potential functions of global solution networks. The GSN is refining evaluation criteria and instruments in concert with P4A.

3.8 Sustaining the Platform

To be successful and achieve the goals of the project, P4A must be sustainable beyond the duration of the project. The P4A design team will explore, develop and evaluate possible sustainability models. Some of the models to be considered include but are not limited to: transaction models, value-added service models, subscription models, advertising models, bartering models and pay-what-you-wish models. P4A will also explore innovative agreements such as cost reduction rewards for cost savings in public service provision and social impact bonds or investments [13].

4 Conclusion

P4A will harness network effects to address an age-old market bias against the outliers or minority needs. It will create the conditions and provide the supports to ensure that addressing outlying needs is economically viable for suppliers and producers and affordable for consumers. By creating a market platform that connects consumers at the margins with suppliers and producers at the margins P4A hope to provide consumers with “what you need, when, where and how you need it” and producers and suppliers with work “when, where and how you can.” This will create the conditions for greater prosperity and economic inclusion. The success of the platform depends in large part upon a diverse and responsive set of user experiences that are both usable and accessible.

References

1. Wilkinson, R., Pickett, K.: *The Spirit Level: Why More Equal Societies Almost Always Do Better*. Allen Lane (2009)
2. Digital Impact Group. *The Economic Impact of Digital Exclusion*. Econsult Corporation, Philadelphia (2010)
3. United Nations. *Factsheet on Persons with Disabilities*, <http://www.un.org/disabilities/default.asp?id=18> (December 26, 2013) (retrieved)
4. Treviranus, J., Fichten, C.S., Stolarick, K., Kemper, A.: *Leveraging Inclusion and Diversity as Canada’s Digital Advantage*. Social Sciences and Humanities Research Council, Knowledge Synthesis on the Digital Economy (2010)
5. Tapscott, D., Williams, A.D.: *Macrowikinomics: New Solutions for a Connected Planet*. Penguin Group Inc., USA (2012)
6. http://cordis.europa.eu/fp7/home_en.html
7. <http://www.un.org/disabilities/convention/conventionfull.shtml>
8. Treviranus, J.: *Leveraging the Web as a Platform for Economic Inclusion*. *Behav. Sci. Law*. Wiley Online (2014)
9. Hagiu, A.: *Multi-Sided Platforms: From Microfoundations to Design and Expansion Strategies* (2006), <http://www.hbs.edu/faculty/Publication%20Files/07-094.pdf> (February 13, 2013) (retrieved)
10. Choudary, S.P. (2013), <http://platformed.info/platform-thinking/>
11. Recklies, D.: *Beyond Porter _ A Critique of the Critique of Porter* (2013), <http://www.themanager.org/strategy/BeyondPorter.htm>
12. <http://gsnetworks.org>
13. Pettus, A.: *Social Impact Bonds* (2013), <http://harvardmagazine.com/2013/07/social-impact-bonds>