The Missing Link: Intention to Produce Online Content Accessible to People with Disabilities by Non-Professionals

Karine Nahon  
The Information School  
University of Washington  
karineb@uw.edu

Izak Benbasat  
Sauder School of Business  
University of British Columbia  
Izak.benbasat@sauder.ubc.ca

Camille Grange  
Sauder School of Business  
University of British Columbia  
Camille.Grange@sauder.ubc.ca

Abstract

The aim of this paper is to provide a theoretical framework to analyze obstacles, challenges, and incentives which lead non-professional developers to design websites and produce information that are accessible to people with disabilities, and to describe the development of a reliable and validated instrument designed to test it. Results show that intrinsic motivation, self-efficacy, influence of one’s close community and the perception that others are responsible to design such websites influence one’s behavior in creating accessible content for people with disabilities.

1. End-User Developers: The Missing Link to Accessibility

People with a variety and extent of disabilities are estimated to comprise 18% of the world’s population, a number that is expected to rise along with an increase in life expectancy and environmental influences [1]. These disabilities include sensory impairments, such as, visual, hearing, speech, motor and cognitive impairments. Additionally, disability increases with age. According to the U.S. Census Bureau's 2008 American Community Survey (ACS) in 2008 an estimated 51.5% of those aged 75+ in the United States reported a disability compared with 38.2% for ages 65+ and 10% for ages 18-64 [2]. Inequalities between people with and without disabilities exist along the lines of access and use of the Internet [3]. For example, 54% of adults living with disability use the Internet, compared with 81% of adults who report having no disability [4]. Finally, a 2004 study commissioned by Microsoft revealed that an even larger percentage of working adults aged 18 to 64 have varying degrees of impairments that may not be identified as disabilities, but contribute to mild-to-severe difficulties in performing computer-related tasks [5]. In other words, a significant portion of society is likely to benefit from having and using accessible technology.

Most of the latest literature about accessibility, in HCI and Information Science, has focused mainly on technology affordances, methodologies, practices and development of accessible design [6-8]. Attention was given both to the demand (users with disabilities) and supply (developers and others involved in the accessibility life cycle) sides of the equation. This includes eliminating technological barriers from the users' perspective on the one hand, and at the same time focusing on developing technologies that will facilitate access to people with disabilities. There is also a body of literature focusing on policy and legal aspects of accessibility, which are considered as critical driving forces for having more accessible content. [9-13]. However, as will be explored later, only few studies investigated in-depth the reasons for not producing accessible content. These focused solely on professional developers and related roles to projects of accessibility (e.g., webmasters, project managers) in the context of government, academia or big corporations [12, 14, 15].

The focus on production of online accessible information by professionals is important. A recent study in the U.S. found that more than 90% of federal government home pages were not in compliance with section 508 of the Rehabilitation Act that promotes equal online access [12]. However, today a big chunk of online information is created by non-professional designers, developers or simply content creators. For example, the Data Center of China Internet (DCCI) reported that the content produced by Chinese Internet users accounted for 50.7% of the total as compared 47.3% produced by professional websites [16]. Fischer refers to them as end-user developers [17], and Tapscott and Williams refer to them as prosumers [18]. We will refer to these users in this article as non-professional developers, but it is important to emphasize that we are discussing end-user developers, users who mainly create content rather than focus on developing software (e.g., writing a blog, updating features and text of websites, creating content in social networks). These non-
professional developers employ readily available customized technologies and platforms that are produced by professional application and system designers. These tools enable them to create their own content on the Internet and even modify to a certain extent the design of applications as desired without the need for advanced programming skills. These users produce content in various ways, which include creating text and other audio-visual artifacts on blogs, websites, social networks, and wikis; sharing and taking photos; recording and mashing music and videos; creating avatars and other content in virtual worlds and more. Studies about end-user/non-professional developers and accessibility are rare. Consequently, a small number of scholars have warned about the implications of neglecting the level of inclusivity in web design that is created by end-users [19, 20].

Therefore, this paper aims to focus on users who are non-professional developers who produce online content. Since this topic is under-studied, it lacks a rigorous theory development and adequate measurement of constructs. The motivation for this study is to fill in that gap and understand why many end-users who are engaged in producing information in the Internet do not produce accessible information to people with disabilities. The paper reports on the development and testing of a reliable and validated instrument designed to measure perceptions that non-professional developers may have of producing information that is accessible to people with disabilities. Accordingly, it provides a theoretical model to analyze the obstacles, challenges, and incentives which lead or prevent users who are non-professionals to produce information that are accessible to people with disabilities. Our paper from 2008 reported on initiating that research process [21]. However, due to multiple phases of testing and validations since then, the theoretical model has changed greatly. Moreover, this paper also presents the results of a full scaled survey according to that theoretical model.

Identifying the factors and providing a reliable and validated instrument as such, may have strong impact on the future of accessible content, by helping to increase the use of information technologies and creation of content with accessible features. Also, it may improve drafting relevant policies, plans, and strategies to increase the number of users who design and produce information accessible to people with disabilities.

2. Barriers to Online Accessible Content

As mentioned above, only scant attention has been given in the literature to the process that impacts intentions of professionals to produce information in the Internet and design websites accessible to people with disabilities. Lazar et al. provided one of the first studies to investigate the perceptions of 175 web developers and webmasters on accessibility and how its state can be improved [22]. As this was an exploratory research it did not seek to develop a rigorous instrument to measure these. Instead, it provided some qualitative insights about the current situation. This study found that only 36% tried to make their website accessible. The reasons were lack of knowledge on web accessibility guidelines, lack of technical knowledge and lack of time. Loiacono et al. add to Lazar’s findings and suggest that the reasons company websites are not more accessible are: lack of knowledge or understanding of accessibility guidelines, inadequate training, insufficient time to incorporate accessibility, technical difficulty, experience, standards that are not useful, financial factors and legal aspects [14]. Freire et al. [15] conducted a more in-depth study which examines the differences in perceptions of accessibility by professionals from the academy, government and industry. They found the following reasons for considering accessibility: legal factors, personal motivation, organization requirement, customer requirement, web standards, tangible and intangible benefits such as good reputation and addressing more customers. Personal motivation appeared as the most popular reason among the respondents. The main reasons for not considering accessibility were: not a requirement of the organization, and lack of training, time and cost.

Meiselwitz et al. argue that “the biggest challenge is to reach every single web developer and every web design company in the world and make them aware of web accessibility” and that “often, companies perceive the costs of universal usability being prohibitive” [23]. Gregor et al., noted that in addition to the lack of awareness and perceived cost, other reasons that lead to the lack of web accessibility include, lack of understanding of the full range of potential customers, lack of motivation, assumed technophobia and low expectations of older and people with disability, and inappropriate tools and technologies [24].

In recent years a growing body of literature suggests to expand the list of stakeholders from just focusing on designers and developers. Lopes et al. studied five stakeholders: developers, accessibility assessors, governmental agencies, service providers and elderly and users with disability [25]. Power and Petrie [20] and Kane [19] suggest focusing on end-
users developers and non-professionals. Finally Kelly et al. argues for a more integrative stakeholder approach to best embed practices of accessibility. However, their emphasis on end-users is still very little. [10]

The studies which focus on professional developers, as well as the studies, which suggest addressing other stakeholders, do not provide a solid theoretical foundation for understanding the intention of developers to produce accessible information, and lack reliable and validated measures to test such theoretical models. In the next section we will suggest a theoretical model that captures the factors which influence the intentions of non-professional developers to make the web accessible to people with disabilities.

3. Research Model

Our research model (see Figure 1) depicts perceived challenges and incentives in predicting intention to produce accessible information by non-professional developers. We discuss each component of this model below. Identifying and constructing the theoretical model was a challenging task, since the literature focused solely on professional designers and developers and the work environment (i.e., governmental agencies, companies and academia). The proposed model needed to take into account the transformation from the professional to the general context, which meant considering a different set of criteria that drive the non-professional developers’ design behavior.

3.1. Developing the Research Model

In the absence of any past and sound theoretical framework on the topic, we anchored the development of the model within the Theory of Planned Behavior (TPB) [26, 27], and motivation theory [28]. Additionally, we supplemented the theory with the factors that the literature on accessibility addressed (‘cost’ and ‘legal context’). Finally, one of the main contributions of this model is the addition of two new constructs that were not mentioned before in the literature (‘responsibility shifting’ and ‘context detachment’). See Table 1 that summarizes the different components of the research model.

There are several reasons for choosing to start with these two theories (TPB and motivation theory). First, these models explain on average a relative high percentage of the variance in intention. TPB models explain on average between 40%-50% [29], and motivation theory around 40% [30]. Second, we were interested in explaining and predicting behavior from attitudinal perspectives, which are in the core of these two theories. Third, these two theories have been tested in variety of contexts over the years, and proved to have high predictive power.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Operationalized Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to produce</td>
<td>Intention to produce information that is accessible for people with disabilities.</td>
</tr>
<tr>
<td>Attitude</td>
<td>Feelings of personal obligation or responsibility towards the issue of accessible content.</td>
</tr>
<tr>
<td>Community context</td>
<td>Perception of the impact of the immediate cultural environment through which one’s identity is being shaped.</td>
</tr>
<tr>
<td>Legal context</td>
<td>Perception of the impact of statutory and regulatory constraints and freedoms.</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>One’s judgment of his/her capability to produce online content accessible by people with disabilities.</td>
</tr>
<tr>
<td>Responsibility Shifting</td>
<td>The degree of belief that producing online content accessible by people with disabilities should be handled by others.</td>
</tr>
<tr>
<td>Context detachment</td>
<td>The degree of belief that the online content one produces is not relevant to people with disabilities.</td>
</tr>
<tr>
<td>Values</td>
<td>Feelings of personal obligation or responsibility towards people with disabilities in general.</td>
</tr>
<tr>
<td>Cost</td>
<td>The belief of the degree to which producing, learning how to produce, and maintaining accessible online content for people with disabilities would be free of effort.</td>
</tr>
<tr>
<td>Intrinsic motivation</td>
<td>The perception that users will want to produce accessible online content for people with disabilities for purposes of self-fulfillment.</td>
</tr>
<tr>
<td>Extrinsic motivation</td>
<td>The degree to which one believes producing online content accessible by people with disabilities will lead to valued outcomes</td>
</tr>
</tbody>
</table>

3.1.1 Contextualizing Theory of Planned Behavior to Address Accessibility
According to the theory of planned behavior, intentions to act are influenced by attitudes toward the behavior, subjective norms, and perception of behavioral control. Each one of these variables is guided by a set of beliefs (see the upper part of figure 2). Finally, “given a sufficient degree of actual control over the behavior, people are expected to carry out their intentions when the opportunity arises” [31].

Gregor and Newell [32] emphasize the importance of the attitude of designers as a predictor of their behavior. Designers with a negative attitude towards accessibility can create obstacles to design accessible tools or produce content that are inaccessible or insufficiently accessible. This task might be even more challenging when non-professional users are the designers. Next, we will explain the adaptation being done from the traditional TPB to the accessibility context (see the lower part of figure 2).

**Figure 2: Transforming TPB into our Research Model**

In particular, it is important to discuss the components of the perceived behavioral control (PBC) that were chosen, and why context is used instead of subjective norms. The inclusion of PBC provides information about the potential constraints on the action of producing accessible content as perceived by the non-professional developer, and explains why intentions do not always predict behavior.

Ajzen in 2002 refined his TPB model and argued that perceived behavioral control over performance of a behavior is comprised of separable components that reflect beliefs about self-efficacy and about controllability [31]. Self-efficacy refers to the confidence one has in her ability to perform a task [33], in our case, the confidence non-professional developers have in their ability to produce content that is accessible to people with disabilities. Ajzen claimed that the addition of perceived self-efficacy always improved the prediction of intention, while perceived controllability usually had no significant effects on intentions. In contrast to self-efficacy, controllability denotes the perceived belief of control over the performance of the behavior itself (or the extent to which performance is up to the actor). In this study we introduce two new constructs that behave as a controllability component: ‘responsibility shifting’ and ‘context detachment’. The two factors were mentioned in the accessibility literature but to a lesser degree in the Information Systems literature.

Context Detachment refers to how users often falsely assume that their content would not be of interest to people with disabilities or assume people with disabilities suffer from technophobia [32]. This provides them with excuses and rationale for not designing accessible sites. Non-professional developers usually employ others’ technologies, platforms and applications, and therefore assume that they do not have any responsibility to contribute to accessibility issues since this is something the service and content providers should take care of. The idea that end-users see themselves as ‘small pawns’ in the process adversely impacts their intention to do anything about this. For example, users who upload video on YouTube will often think that they lack the capability to do anything which concerns accessibility, since they are using YouTube’s platform to share content. This assumption of course is erroneous. Even when capabilities of non-professional developers are minimized by the providers of the platform, they can still enhance accessibility levels of the uploaded content (e.g., by adding descriptive text or tags to pictures).

The final component to transform from TPB is subjective norms, which refers to "the perception that most people who are important to him think he should or should not perform the behavior in question" [26]. In our study we called this construct community context, to denote the impact of the community on the intention to produce accessible content. The literature on accessibility has not done a good job of studying the influence of the community on designers’ intentions and behaviors, while other disciplines have emphasized its role as antecedent of behavior [34]. The community impacts not only intention of behavior, but also shapes many of our preferences, norms and beliefs and therefore attitude towards issues. Some cultures may refer to disability as an undesired issue or taboo which may influence users' attitude towards disability in general and accessibility in particular. Even societies who support equal rights for people with disabilities may address
challenges of accessibility differently and therefore influence the attitudes of individuals in those societies and communities in different ways. Due to the size of the model we focused at this phase only at how community contexts impacts intentions.

The literature on accessibility analyzes in-depth the impact of laws and guidelines on corporate, government and academia websites, and to a lesser degree, their impact on intention of webmasters to produce accessible content. A major motivation for improving accessibility by professional developers comes from the legal context. Studies argued that ineffective law enforcement serve in many cases as a major barrier to developing accessible websites [9, 10, 12, 13, 15, 25]. The WAI (World Accessibility Initiative) has been successful in promoting WCAG (Web Content Accessibility Guidelines) around the world and the guidelines have been adopted by many organizations. Nevertheless, many organizations are still inaccessible or have an insufficient level of accessibility [14]. Our study however, addresses non-professional developers, who are not obliged by law to make their content accessible. Since they do not produce content as part of their working environment and therefore do not have an organization that enforces these guidelines to produce accessible content. Therefore, our hypothesis (H3) is that the influence of the legal context in context of non-professional developers will be low, if at all.

To this basic foundational model we added the factor of cost. This has been discussed in depth in the literature about accessibility. The literature indicates Perceived Cost as a major impediment to the intention to produce accessible websites in the work environment. Managers and designers reiterate that "it is not economically practical to take these people into account" [32] or that "it is very difficult and expensive to design accessible systems and thus do not make any attempt to reduce exclusion" (p.288). Shindler [35] claims that designers and managers often think that the effort and financial investment required for improving access is not worth the positive and ethical image they get in return. Actually, Lazar and Jaeger claim that when a website is designed to be accessible from the beginning, the cost is negligible [12]. Additionally, studies have demonstrated that "the basic outcome of inclusive design is in fact likely to result in economic benefit. If a product or technology that can be accessed and used by a wider audience than that which would otherwise be possible, then it follows that the potential customer base for that technology is increased" [32].

For the purpose of our study we referred to three types of cost: production cost, maintenance cost and learning cost. Learning cost plays a big role in producing accessible content. Studies have warned about the lack of training and the need to reduce the learning cost for companies in order to produce more accessible content [14, 23]. This challenge becomes more acute when it comes to non-professional users who may not have much programming or accessibility design knowledge.

3.1.2 Contextualizing Motivation Theory to Address Accessibility

The second theory that served to anchor the research model is the motivation theory [28, 30]. In its basis, it refers to two distinct types of motivations: intrinsic and extrinsic motivation. Intrinsic motivation refers to behaviors performed out of interest and enjoyment. In contrast, extrinsic motivation pertains to behaviors carried out to attain contingent outcomes [28]. In many studies, these two types of motivations serve as predictors to attitude, which consequently affect the intention to perform a behavior. Freire et al [15] found in their survey to web developers in academia, industry and government that personal motivation appeared as one of the main reasons for considering accessibility. However, their study did not distinguish between the two types of motivation. Our hypothesis is that the influence extrinsic motivation will have on attitude will be very weak, if at all. Our assumption is that non-professional developers who decide to produce accessible content do not act for the sake of tangible rewards or outcomes. They are not being paid for making their content accessible, so the incentive for performing that behavior is most likely derived from a more internal reasoning.

This part depicted the basic elements of our research model. Next, we will explore the research design.

4. Research Design and Data Collection

4.1. Instrument Development Process

The instrument development process aimed at measuring in a reliable and valid way the constructs which are part of the research model shown in Figure 1. The development of the instrument followed the methodology proposed by Moore and Benbasat [36] and included three stages: i) item creation – creating a pool of items to match each construct definition. The objective of this stage was to ensure content validity; ii) scale development – using a total of 12 judges in multiple rounds to sort items into construct categories (scales), and then, examining judges’ inter-rater reliabilities and their consistency of labeling
these scales. The goals of this stage were to assess the construct validity of the various scales being developed, and to identify any particular items which still may be ambiguous; iii) **instrument testing** - The objective of this stage was to check the scale reliability and further assessment of validity. We employed two iterations of pilots (106 and 86 users), in order to test the instrument before launching the final survey. After each pilot, the instrument was further refined. More elaboration about the process of developing the instrument can be found in Barzilai-Nahon et al [21]. This paper does not focus on the development of the instrument, but on the theoretical model suggested after multiple phasing of testing and validation and on results from launching the full-scale survey.

Most of the model’s latent variables were measured with reflective scales (see Appendix 1), which were developed using existing work on IT behavior intention (e.g., Davis et al [28], Venkatesh et al [30]) and online accessibility (e.g., Barzilai-Nahon et al [21], Lazar et al and [22]). See Appendix 1 for a final list of the items with their loadings.

### 4.2. Data Collection

We created an online survey for data collection using the panel of a marketing company. Respondents were 417 Canadian and American. We used two criteria to recruit the sample – i) participants had to be non-professional developers of online content (i.e., producing content via blogs, social networking sites, personal websites, or virtual worlds), in other words, they had to be users that produced information in their past; ii) they had to be older than the age 19. This was mainly decided upon following human-subject restrictions. The sample itself was a representative sample, recruited from among the members of nationwide marketing panel. The subjects were provided with a point-based incentive scheme by the marketing company for their participation in the study redeemable for prizes.

The sample consisted of 207 female and 207 male; only 30 of the respondents (7.2%) indicated that they have any sort of a disability that hampers their use of Internet technologies. As expected, the most popular type of production of information/content in the Internet was social networks (see Figure 3). Respondents could choose multiple types of production of content.

**Figure 3: Production of Information by Non-professional developers**

When examining the perceptions of non-professional developers regarding the frequency with which they produced accessible content in the past, we see that the majority (52%) of non-professional developers reported to have never produced content that is accessible to people with disabilities (see figure 4). Another 15% reported of doing so very rarely or rarely. This gives a rough estimate that roughly 67% of content developed of non-professional developers is insufficiently accessible or inaccessible to people with disabilities.

**Figure 4: Production of Accessible Content in the Past**

### 4.3. Analysis and Results

We applied Partial Least Square (PLS) analysis using SmartPLS [37] to assess the measurement and structural models. The internal consistency of the measures of the constructs was assessed using composite reliability (CR) and the average variance extracted (AVE). As shown in Table 2, the CR of each reflective construct was above 0.80, the AVE for each of these constructs was above 0.50, and the square root of their AVE was superior to the intercorrelations between the latent variables, providing supporting evidence for the convergent and discriminant validity of the model’s reflective constructs’ [38].
We then estimated the structural relationships between the constructs, as illustrated in Figure 5. The results show that our model predicts 63% of the intention of non-professional developers to produce accessible content, and that the strongest significant predictors are attitude towards producing accessible content (β=0.34), self-efficacy (β=0.3), community and legal influences (β=0.29 and β=0.1). Responsibility shifting (β=-0.14) had a negative effect on Intention to produce, in other words, when people reported a high level of shifting the responsibility to produce to other actors, their perceived intention to produce decreased. Finally, Intrinsic motivation was the strongest significant predictor of Attitude (β=0.62), and values also influenced (β=0.17) attitude. Note, however, that both cost and extrinsic motivation did not impact attitude. We will elaborate on this in the next section.

5. Discussion: Moving End-Users towards Contextual Inclusive Society

Most of the literature about accessibility, has focused mainly on technology affordances, methodologies, practices and development of accessible design [6–8], and on policy and legal aspects of accessibility [9–13]. The few studies which investigated in-depth the reasons for producing/not producing accessible content focused solely on professionals within the organizational context [12, 14, 15]. A small number of scholars have argued for shifting attention to non-professional developers in the context of accessibility [19, 20]. This study studies this missing link: understanding the intentions of non-professional developers to produce content or design websites that are accessible to people with disabilities. The results call for discussion on three main points. First, discussing the strength of factors that are internal prompts to action (i.e., intrinsic motivation and values), as opposed to external prompts (i.e., cost and extrinsic motivation) in the context of non-professional developers; Second, discussing the critical role of community in encouraging actions of producing accessible content; and Third, discussing the importance of incorporating two novice factors (responsibility shifting and context detachment) in future models that depict intention to produce accessible content.

5.1. Focusing on Internal Prompts to Action

The results showed that contrary to its intrinsic counterpart, extrinsic motivation does not affect the attitude of non-professional developers to produce accessible content. The act of designing for others, rather than themselves, is in the core of designing accessible content and websites by non-professional developers. It may be regarded as a similar act of contributing to others in the community; for example, building homes for people who cannot afford it.

The direct beneficiaries of this act are the others. Literature examining contributions to open source initiatives have found three key motivations for such contributions: desire to establish one’s reputation, desire for self-development and desire to help others in the community [39]. This study, however, shows that extrinsic motivation, manifesting instrumentality, does not exist in cases of producing accessible content. The act itself is purely intrinsic and bestows internal rewards from the act itself, such as self-actualizing. It will be interesting to further refine what this intrinsic motivation includes. Is it more of an altruism, in which non-professional developers provide a value to a party, which must be anyone but
themselves? Or is it for purposes of self-actualizing or satisfaction? What are the relationships among these factors?

While intrinsic motivation appeared to be the most influential factor to affect attitude, also values, another intrinsic factor appeared as a factor that determines attitude. Values reflect the internal sense of obligation individuals have towards the topic of accessibility. It does not assure, however, that the general feelings of obligation will be later transformed into actions of producing accessible content, but it plays an important role in constituting a positive attitude towards producing accessible content.

These findings are in contrast to the literature that studied the professional and organizational settings. That literature emphasize external prompts as inhibitors and enablers of producing accessible information (e.g.: technical difficulties, standards that are useful, legal aspects or inadequate training) [14]. In the professional setting, designing accessible tools and content is perceived as part of one’s job responsibility. The personal motives are relegated to the bottom of the list, and what act is driven by the guidelines given to them by their management.

5.2. Community as a driver to Accessibility

According to the results of our study, the community has a strong impact on the intention of non-professional developers to produce accessible content. The literature on accessibility usually focuses on the individual designer, or on the organization as a unit of analysis. The community is more than a role-model for individuals. The community influences intention to produce accessible content through its apparatuses, symbols, language and narratives. An environment that promotes rights of people with disability in general, and accessibility rights specifically, has a tremendous impact on the way its member behave in context of such topics.

5.3. Responsibility Shifting and Context Detachment: Are they just Excuses?

Advanced information technologies accorded more alternatives and power to users which they did not have before. They are now able to produce themselves content, and design to a certain limit. At one time this was the domain of professionals only. These capabilities empowered users to share information, design without knowing programming, upload multimedia and information, and reach out to others. Some of these ‘others’ are people with disabilities. The negative side effect of this is that users feel that they are not responsible when using these platforms. Since they are not ‘real’ designers, they can enjoy the benefits of designing without feeling responsible when providing content to other people. It is important to recognize that these ‘other people’ may also be people with disabilities who face many challenges when trying to access web content in today’s dynamic, user-generated internet environment. These perceptions can be changed with the proper guidelines and education.

The two variables that are introduced here for the first time: responsibility shifting and context detachment may provide us the answer to the paradox of inclusive technology. The paradox of inclusive technology argues that inclusive technology seems compelling, yet designers are not in a hurry to embrace accessible design. In the context of non-professional developers the answer to that paradox may be found in these two concepts (responsibility shifting and context detachment). Non-professional developers in many cases do not believe that the content they produce is relevant to people with disabilities, or that people with disabilities will access their content. When end-users have perception of context detachment from people with disabilities, this increases their perception that the responsibility should be shifted from them. They interpret the perception of not-relevant as not-responsible. Almost as the effect of the ostrich’s head in the sand – If I don’t see, then I am not seen. If it is not relevant to me, then I am not responsible.

Finally, the blurriness of who is responsible on making the information accessible becomes more acute as social media and networks evolve. Non-professional developers act within boundaries and platforms of providers (such as Facebook, YouTube). This provides an illusion of lack of control and ability to contribute to the accessibility of the content.

6. Conclusions

The aim of this paper is to provide a theoretical framework to analyze obstacles, challenges, and incentives which lead a non-professional developers to design websites and produce information that are accessible to people with disabilities, and to describe the development of a reliable and validated instrument designed to test it. We empirically tested our research model on 417 subjects of non-professional developers and found that community context, attitude and self-efficacy were the most important predictors of intention to produce accessible content. We also found that internal prompts determine attitude (i.e., intrinsic motivation
and values), and not external prompts (i.e., cost and extrinsic motivation). Finally, we propose two new constructs that are important in prediction of intention to produce accessible content: responsibility shifting and context detachment.

6. Bibliography


### Intention to produce

- The next time I produce online content, I will make sure it is accessible. (0.86)
- I plan to produce accessible online content from now on (0.90)
- In the future, all online content I produce will be accessible content (0.88)

### Attitude

- Producing accessible online content is a great idea. (0.86)
- Providing accessible online content is a good thing to do. (0.91)
- I like the idea of producing accessible online content (0.92)
- It is worthwhile to produce accessible online content (0.82)

### Responsibility shifting

- It is not my responsibility to produce accessible online content. (-)

### Context detachment

- The online content I produce will not be of interest to people with disabilities. (0.87)
- The online content I produce will not be useful to people with disabilities (0.89)
- The online content that I produce will not be relevant to people with disabilities (0.89)
- The online content that I produce will not be utilized by people with disabilities (0.88)

### Extrinsic motivation

- Producing accessible online content will attract more visitors to this content (0.83)
- Producing accessible online content will increase my job market value (0.86)
- Producing accessible online content will create future opportunities for me (0.90)

### Intrinsic motivation

- Producing accessible online content gives me a good feeling (0.82)
- Producing accessible online content gives me self-satisfaction (0.90)
- Producing accessible online content improves my self-esteem (0.86)

### Self-efficacy

- I am able to produce accessible online content (0.89)
- I can produce accessible online content (0.90)
- I know how to produce accessible online content (0.87)
- I do not know how to produce accessible online content (0.59*)
- I cannot produce accessible online content without someone showing me how to do it first (0.65*)

### Cost

- Producing accessible online content would be easy (0.86)
- Learning how to produce accessible online content would be easy (0.88)
- Maintaining accessible online content would be easy (0.85)

### Legal context

- I believe I am required by law to produce accessible online content. (0.93)
- I believe the legal system will punish me if I do not produce accessible online content. (0.81)
- I believe there are no laws concerning the production of accessible content (0.23*)

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**Appendix 1 - ITEMS and LOADINGS**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Reflective indicators [7 point scales: from strongly disagree to strongly agree]</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISABILITIES</td>
<td>- I believe there are no laws concerning the production of accessible content</td>
<td>0.23*</td>
</tr>
<tr>
<td>PRODUCTION</td>
<td>- I believe I am required by law to produce accessible online content.</td>
<td>0.93</td>
</tr>
<tr>
<td>SELF-EFFICACY</td>
<td>- I am able to produce accessible online content.</td>
<td>0.89</td>
</tr>
<tr>
<td>COST</td>
<td>- Producing accessible online content would be easy.</td>
<td>0.86</td>
</tr>
<tr>
<td>ATTITUDE</td>
<td>- Producing accessible online content is a great idea.</td>
<td>0.86</td>
</tr>
<tr>
<td>ATTITUDE</td>
<td>- Providing accessible online content is a good thing to do.</td>
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</tr>
<tr>
<td>ATTITUDE</td>
<td>- I like the idea of producing accessible online content.</td>
<td>0.92</td>
</tr>
<tr>
<td>ATTITUDE</td>
<td>- It is worthwhile to produce accessible online content.</td>
<td>0.82</td>
</tr>
<tr>
<td>RESPONSIBILITY</td>
<td>- It is not my responsibility to produce accessible online content.</td>
<td>-</td>
</tr>
<tr>
<td>RESPONSIBILITY</td>
<td>- The online content I produce will not be of interest to people with disabilities.</td>
<td>0.87</td>
</tr>
<tr>
<td>RESPONSIBILITY</td>
<td>- The online content I produce will not be useful to people with disabilities.</td>
<td>0.89</td>
</tr>
<tr>
<td>RESPONSIBILITY</td>
<td>- The online content that I produce will not be relevant to people with disabilities.</td>
<td>0.89</td>
</tr>
<tr>
<td>RESPONSIBILITY</td>
<td>- The online content that I produce will not be utilized by people with disabilities.</td>
<td>0.88</td>
</tr>
<tr>
<td>CONTEXT DETACHMENT</td>
<td>- The online content I produce will not be of interest to people with disabilities.</td>
<td>0.87</td>
</tr>
<tr>
<td>CONTEXT DETACHMENT</td>
<td>- The online content I produce will not be useful to people with disabilities.</td>
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<td>CONTEXT DETACHMENT</td>
<td>- The online content that I produce will not be utilized by people with disabilities.</td>
<td>0.88</td>
</tr>
<tr>
<td>EXTRINSIC MOTIVATION</td>
<td>- Producing accessible online content will attract more visitors to this content</td>
<td>0.83</td>
</tr>
<tr>
<td>EXTRINSIC MOTIVATION</td>
<td>- Producing accessible online content will increase my job market value.</td>
<td>0.86</td>
</tr>
<tr>
<td>EXTRINSIC MOTIVATION</td>
<td>- Producing accessible online content will create future opportunities for me.</td>
<td>0.90</td>
</tr>
<tr>
<td>INTRINSIC MOTIVATION</td>
<td>- Producing accessible online content gives me a good feeling.</td>
<td>0.82</td>
</tr>
<tr>
<td>INTRINSIC MOTIVATION</td>
<td>- Producing accessible online content gives me self-satisfaction.</td>
<td>0.90</td>
</tr>
<tr>
<td>INTRINSIC MOTIVATION</td>
<td>- Producing accessible online content improves my self-esteem.</td>
<td>0.86</td>
</tr>
<tr>
<td>SELF-EFFICACY</td>
<td>- I am able to produce accessible online content.</td>
<td>0.89</td>
</tr>
<tr>
<td>SELF-EFFICACY</td>
<td>- I can produce accessible online content.</td>
<td>0.90</td>
</tr>
<tr>
<td>SELF-EFFICACY</td>
<td>- I know how to produce accessible online content.</td>
<td>0.87</td>
</tr>
<tr>
<td>SELF-EFFICACY</td>
<td>- I do not know how to produce accessible online content.</td>
<td>0.59*</td>
</tr>
<tr>
<td>SELF-EFFICACY</td>
<td>- I cannot produce accessible online content without someone showing me how to do it first</td>
<td>0.65*</td>
</tr>
<tr>
<td>DISABILITIES</td>
<td>- I believe there are no laws concerning the production of accessible content.</td>
<td>0.23*</td>
</tr>
<tr>
<td>PRODUCTION</td>
<td>- I believe I am required by law to produce accessible online content.</td>
<td>0.93</td>
</tr>
<tr>
<td>SELF-EFFICACY</td>
<td>- I am able to produce accessible online content.</td>
<td>0.89</td>
</tr>
<tr>
<td>COST</td>
<td>- Producing accessible online content would be easy.</td>
<td>0.86</td>
</tr>
<tr>
<td>LEGAL CONTEXT</td>
<td>- I believe the legal system will punish me if I do not produce accessible online content.</td>
<td>0.81</td>
</tr>
<tr>
<td>LEGAL CONTEXT</td>
<td>- I believe there are no laws concerning the production of accessible content.</td>
<td>0.23*</td>
</tr>
<tr>
<td>accessible online content</td>
<td>0.27*</td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td><em>I believe the legal system requires people with disabilities to be treated the same as others.</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Community context</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- People who are important to me believe that I should produce accessible online content.</td>
<td>0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- People who are important to me encourage me to produce accessible online content</td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- People who are important to me don't care if I produce accessible online content</td>
<td>0.64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Italic: discarded items*

**Other measures**

**Values**

A summative index resulting from answers to the following questions:
- How important do you consider disability rights?
- It is important to provide special services that help people with disabilities (e.g. parking spaces)?
- When you had the opportunity, how often in the past have you done anything to promote disability rights?