Paper for the Special Theme on Early Career Research

Improving Quality of Life for People With Disability Through Social Media: Towards an Affordance Framework

Marius Rohde Johannessen and Karen Stendal
University of South-Eastern Norway, School of Business
mj@usn.no
ks@usn.no

Abstract: Information and communication technologies (ICT) are important for people with disability in their day-to-day life, as they offer possibilities and opportunities for these people to enjoy a range of new social interactions. In this article we examine the affordances of different types of social media and discuss the dichotomy between simplicity of use and social presence. Further, we discuss the implications of these affordances for development of public e-services aimed at improving the social life of people with disabilities. Our findings show that virtual worlds are the most engaging medium. However, other social media can to some extent offer the same affordances for people with disability. We suggest that future research should empirically investigate the affordances offered by social media to people with disability and find ways of combining the affordance perspective with usability studies to fill the void in the category high social presence/low complexity of use. Finally, we present suggestions for development of an e-service that can fill this gap and create a viable social medium for people with disability.

Keywords: Affordances, social media, virtual worlds, second life, people with disabilities, ease of use, egovernment service

1. Introduction

People with disability constitute a large group of the world's population. Approximately one billion of the world's population have some type of disability (Krueger and Stineman, 2011). They experience barriers to social inclusion and entering the work force and are less likely to have interpersonal relationships outside of family ties (Ballin and Balandin, 2007). The feeling of being treated as different and not perceived as equal is a challenge. This sentiment is due to society regarding people with disability as if impairment in one area of function invalidates their ability or access to opportunity in another area (Hammel et al., 2008). There is a need for more public e-services aimed at this group, especially services focusing on accessibility, information and communication (Fisher, Peterson and Albert, 2015), Communication is a key issue for people with disability (Morgan and Balandin, 1997), as it is an important part of being regarded as a member of a community or society; therefore, feelings of exclusion may affect individuals' ability to communicate and become involved (Jackson, 2006). Information and Communication Technology (ICT) empowers people with disability to experience independence, social connections, and inclusion in society (Renblad, 2003).

Studies of people with disability in eGovernment tends to focus on web accessibility (Jaeger, 2006). However, user-centricity and inclusion have been important eGovernment objectives for almost a decade (Verdegem and Verleye, 2009). We therefore argue that there is a need for eGovernment research on how to better include people with disability in all aspects of society, and that virtual worlds and other social media can be important to achieve this.

A major difference between virtual worlds and other social media is the complexity associated with using the systems. Other, non-3D-based social media platforms are easier to use (Cha, 2010). User acceptance studies show however; that ease of use is less important than usefulness in determining the use of virtual worlds (Fetscherin and Lattemann, 2008). We do not know whether there is a difference between the affordances in virtual worlds and in other social media. Thus; our research questions are:

RQ1: How do virtual world affordances compare to other social media affordances?
RQ2: What are the implications of these differences for the development of eGovernment services supporting communication for people with disabilities?

Reference this paper: Johannessen, M. R., and Stendal, K., 2018. Improving Quality of Life for People With Disability Through Social Media: Towards an Affordance Framework. *The Electronic Journal of e-Government,* 16(2), pp. 147-158, available online at www.ejeg.com

To address this question, the research relies on the exploratory, qualitative method. The empirical portion of the study was conducted through participatory observation and in-depth interviews; data was collected from novice and experienced users of the virtual world Second Life™, as well as from a user study and technical capabilities study of social media. Using literature on user complexity and social presence, we outline the beginnings of a framework for social media affordances for people with disability and present suggestions for a social medium tailored for this group.

2. Related research

In this section we provide an overview of research into eGovernment services for people with disabilities, showing a research gap related to services aimed at improving the social life of this group. We present the affordance perspective to show how the combination of user perceptions and technological capabilities together determine the usefulness of a given technology for the user.

2.1 eGovernment services for people with disabilities

People with disabilities report feelings of unequal power relations, negative perceptions of ability, lack of knowledge and inadequate consultation related to eGovernment services (John and Paul, 2012). While web accessibility and usability have been on the agenda for some time (Jaeger, 2006, Huang, 2003), there has been little research outside of the health realm aimed at creating services that could improve quality of life for people with disabilities. A recent literature review found only 22 previous studies on social media use in the broader field of public health, mostly covering the use of Twitter for communication between health professionals or health professionals and citizens (Tursunbayeva, Franco and Pagliari, 2017). One study argues that the public sector is falling behind when it comes to novel uses of social media applications (Jukić and Merlak, 2017). There is, in other words, a gap in literature regarding how to apply social media to increase quality of life for people with disabilities.

There are, however, several studies examining the adoption, use and creation of public services, which can act as a starting point for developing social media applications for people with disabilities. ALotaibi et al. (2016) finds that motivational factors such as virtual presence and identity, accessibility and the interactive attributes of social media increase adoption, these factors have also been identified as important for people with disabilities (Fisher, Peterson and Albert, 2015). The user-involvement perspective is also found in other studies, pointing out the importance of involving users throughout the process in order to create citizen-centric government. (Holgersson, Axelsson and Melin, 2017).

Mergel and Bretschneider (2013) propose a three-stage model for social media-adoption by government. Stage 1 involves informal experiment done by single government entities. Stage 2 develops a more formalized process with rules and standards. Stage 3 involves new organizational structures, where technologies are set and procedures are formalized. Hoffmann, Lutz and Meckel (2014) expand on the maturity aspect, showing the factors that are important for social media use and integration. Organizations need to have leadership support and autonomy to develop services, as well as an organizational structure, processes and resources for development and maintenance.

More specifically for people with disabilities, previous research found that while it was not an explicit issue in many projects, accessibility for people with disabilities was strengthened when there were diverse stakeholder groups involved, and stakeholder groups concerned with wider public participation, such as universities and health care institutions. Pricing and delivery structure also had implications for whether the service was universally designed (Baker, Fairchild and Pater, 2012).

In summary, designing a good service involves a user-centric approach with emphasis on identity, virtual presence and interaction, involvement of the correct stakeholders and a proper level of maturity in government organizations. As our empirical basis includes the actual users, we propose using the affordances perspective to develop an understanding of their needs.

2.2 Affordances and social affordances

Psychologist J.J. Gibson was one of the first to define the concept of affordances as all “action possibilities” or capabilities latent in the environment. Affordances are objectively measurable and independent of the individual’s ability to recognize them. However, there is always a relation to the actors and affordances are

thus dependent on the actors' capabilities (Jones, 2003). Affordances are not there waiting to be utilized, they must be enacted and realized in practice (Leonardi, 2013), and are subject to constant transformation (Glăveanu, 2012).

When technology affords some kind of social practice or interaction, it is defined as a social affordance (Hsieh, 2012). Social affordances are the application of perceived capabilities for social practice, and the main difference from a "regular" affordance is how the technology facilitates social relationships, groups and communities (Sutcliffe et al., 2011). The social affordances lens has been applied to explore the implications of interactive ICT use on digital inequality (Hsieh, 2012).

Analyzing technological capabilities, as well as asking how and in what situations certain affordances are manifested, provides an understanding of the affordances a technology offers people with disability. An affordance will be identified through how and when various action possibilities are available or unavailable to a specific actor in a particular setting (Bloomfield, Latham and Vurdubakis, 2010).

2.3 People with disability

The World Health Organization (WHO) defined disability as follows:

> *"Disabilities is an umbrella term, covering impairments, activity limitations, and participation restrictions. An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations." (WHO, 2015).*

One of the difficulties people with disability experience is communication (Milner and Kelly, 2009). Communication is intrinsic to being connected and feeling part of a community or society, consequently communication impairments can give rise to feelings of exclusion from being an active citizen (Jackson, 2006). Community inclusion and being part of society are realized to some extent by having the opportunity to talk and interact with a partner, friends and others in the community (Milner and Kelly, 2009).

Another challenge for people with disability is the feeling of being treated as different, of not being seen as equal to their non-disabled peers (Hammel et al., 2008). Society treating people with disability as if impairment in one area of function invalidates their abilities or access to opportunity in another area is a concern (Hammel et al., 2008).

2.4 Social media

Social media is defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" (Kaplan and Haenlein, 2010). Figure 1 shows an overview of social media, based on the abilities for self-presentation and self-disclosure inherent in the medium. As this study is aimed at examining how people with disability can use technology to be more integrated in society, we have chosen to focus on social media with a medium to high level of social presence and a high level of self-presentation.

		Social presence/ Media richness		
		Low	Medium	High
Self-presentation/ Self-disclosure	High	Blogs	Social networking sites (e.g., Facebook)	Virtual social worlds (e.g., Second Life)
	Low	Collaborative projects (e.g., Wikipedia)	Content communities (e.g., YouTube)	Virtual game worlds (e.g., World of Warcraft)

Figure 1: Overview of social media. From Kaplan and Haeinlen (2010)

Three-dimensional social virtual worlds such as Second Life present similarities to the physical world. The environment offers people the opportunity to be relatively anonymous. Virtual worlds offer the ability to create an avatar that represents the individual controlling it (Stendal, 2014).

Virtual worlds are crowded with avatars who can move around (Baker, Wentz and Woods, 2009) and interact through text-based chat, voice chat and animations (Fominykh, 2012). Virtual worlds let people escape from physical-world constraints and pursue unique activities in which they meet and interact with new and existing friends and networks (Jung and Kang, 2010, Kay, 2007). Many people spend time immersed in virtual worlds because they offer an interactive and unique place (Lim, 2009). In addition, the virtual world environment allows individuals to be aware of information and create identity through the creation of places, objects and avatars (Prasolova-Forland, 2012).

Virtual worlds offer a higher level of social presence (Kaplan and Haenlein, 2010) but achieving this requires careful design considerations. People's satisfaction with social worlds depends on a mixture of social, place and co-presence (Bulu, 2012). The feeling of being somewhere, and being there with someone, allows the user to experience a feeling of immersion. Farzan et al. (2011) found similar results in a study of Facebook communities. Designs that encourage social relationships between users or emphasize the community aspect have more success in creating viable and thriving communities.

2.5 Complexity and ease of use

Social media technologies are generally seen as being easy to use and understand (Lane and Coleman, 2012). However, there are differences among different categories of social media depending on factors such as the complexity and memorability of the interface and the overall satisfaction of using the system. The key factor however, is utility. Does the system provide the needed features? The user's impression of a system's ease of use is influenced by other factors, such as the user's confidence with technology and the usability rating of the system. Users who report low technological confidence are less likely to attempt to use a system with low usability (Venkatesh and Davis, 1996).

A more recent study found that telepresence (the sense of being "in" the system) is important for how users perceive the system (Kwon and Wen, 2010). Other studies have shown that virtual worlds are less user-friendly than other forms of social media (Fetscherin and Lattemann, 2008, Cha, 2010). Simplicity is seen as essential for creating social media that are considered easy to use (Constantinides and Fountain, 2008). Finally, there is a strong link between affordances and usability. For example, Park and Song (2015) describe a usability-focused design approach that was tested and found to enhance the affordances of the system being developed.

3. Research approach

The empirical basis for this article consists of two studies of social media use. The first is an in-depth study of how people with disability can use virtual worlds to improve quality of life. The second is a study of social media capabilities, conducted as part of a case study on electronic government.

The first study included 11 participants. All participants were over the age of 18, diagnosed with a disability, able to give informed consent, had access to and were able to use a computer with broadband. Over a period of 8 weeks in 2011-12, the 11 participants met with the first author in weekly sessions lasting one and a half hours and engaged in different activities in Second Life. In the fourth and eighth week of the study, all participants were interviewed about their experiences in the virtual world. The study included both experienced and inexperienced users to ensure the data also included long-term effects for people with disability.

The second study was part of a case study on social media use in eParticipation, which aimed to conceptualize social media as ensemble IT-artefact. For this case the second author conducted seven interviews as well as content analysis of social media applications. While a slightly different approach than affordances, the ensemble IT-artefact recognizes that technology use is dependent on a combination of the technological capabilities and the user's perceptions and use context (Orlikowski and Iacono, 2001), making the findings from this case compatible with the approach used in the first study.

3.1 Analysis

Content analysis is used to identify, code and categorize primary patterns in interview and observation data (Patton, 2002). Interview data from the first study were analyzed for different perspectives on common issues (Patton, 2002), which were considered important for understanding how people with disability experience the

social affordances offered by virtual worlds and provided data on technological capabilities they saw as important for social presence and quality of life. Combined with the content analysis of the second study's interviews, we have a comprehensive overview of both social needs and technological capabilities of the various social media we examine here.

The second data analysis was conducted using mind-mapping and drawing connections based on the results from previous coding to ensure a larger picture and identification of the affordances offered. Using a hermeneutic approach is in line with the interpretive research tradition (Walsham, 2006).

The selection criteria for social media was 1) the service should have a medium or high social presence and high self-presentation in Kaplan & Haeinlein's (2010) classification scheme, and 2) the service should be among the most used social media sites and globally available (using Alexa.com's ranking).

The reason for only examining high self-presentation/social presence services is that we believe these to be the most relevant services for including people with disability in the wider society, in line with the concerns of Hammel et al. (2008). The reason for focusing on the most popular services in each social media category was simply that the chance for finding a community is bigger in a medium with more users. The different social media and their differences were presented earlier.

4. Findings

In table 1, we present an overview of the six initially identified virtual world affordances and compare these with social media.

Table 1: Virtual Worlds and social media affordances

Affordance	Virtual Worlds	Social media
Communication	The ability to communicate with others through various means in the virtual world	The ability to communicate with others, mainly through text. Video communication is also possible in some Social media channels.
Mobility	The ability to move around in the virtual environment, independent from others and physical constraints	Except for "moving" from one section of the site to another, or between sites, Social media do not provide this affordance.
Personalization	The ability to choose what to disclose and customize representation through an avatar	The ability to choose their online identity through selection of topics for discussion, the information being shared and the images used to represent identity.
Social inclusion	The possibility to experience social inclusion, create and maintain friendships, and experience close interpersonal relationships in the virtual world	The possibility to experience social inclusion through connecting with others in social networks
Personal development	The possibility of personal growth and learning in the virtual world	The possibility of personal growth and learning through content creation, discussion.
Joint activity	The ability to engage in activities together with others in the virtual environment	The ability to engage in activities together with others, mostly in text-based activities.

4.1 Affordance: Communication

The "communication" affordance offers the *"ability to communicate with others through various means"* (Stendal, 2014). Communication is known as one of the main challenges people with disability encounter in the physical world (Jackson, 2006), which indicates this affordance as an important factor for engaging in virtual worlds for people with disability.

Virtual worlds offer the affordance communication through both text and voice. For people with a hearing impairment, the text feature offered by virtual worlds gives them a new and improved way of communicating with a much larger group than they experience in the physical world. While text communication is an affordance for people with a hearing impairment, others see the voice feature offered by Second Life as an affordance. People with a physical disability hindering their ability to use the keyboard efficiently, find the voice feature a very important tool for communication.

Social media can facilitate the affordance of communication for some disability groups. Mainly through text, but in some services also through video. For people with a hearing impairment, text-based communication can be a rich form of communication. For cognitive disability, a service such as Instagram can be valuable, as it offers people a way of expressing themselves through visual means. This would however require some preparation and facilitation in setting up and connecting accounts and bringing together people with similar disability. Social media do not have a voice feature in the same way as virtual worlds, so people with a physical disability would perhaps not see social media as offering this affordance.

4.2 Affordance: Mobility

This affordance is defined "as the ability to move around in the environment, independent from others and physical constraints" (Stendal, 2014).

Virtual world technologies offer the ability to engage in a wide range of activities relatively free from their physical constraints and limitations imposed on them. The virtual worlds offer people with both physical and intellectual disability the opportunity to move around in the environment without being dependent on family members or other caregivers. The affordance of mobility offered by the virtual worlds is a very important factor for people with disability.

Social media do not have the same sense of "place" as virtual worlds. Users can move between groups, accounts and rooms, and some might see this as the affordance of moving. This would however require a great deal of commitment from the user.

4.3 Affordance: Personalization

The affordance "personalization" is defined *"as the ability to choose what to disclose and customize online representation"* (Stendal, 2014). In the physical world, people with disability experience prejudice due to their disability (Hammel et al., 2008).

Virtual worlds offer a representation of self and there is a relationship between the physical and virtual self, in addition to the relationship with others when engaged in the virtual world. The personalization affordance was experienced as of great value offered to people with disability. The ability to choose what to disclose was expressed as a great advantage. Only two of the experienced participants chose to disclose their disability through their avatar.

Social media offer people the opportunity to construct their own online identity, or to play with multiple identities through different accounts and services. Through the topics they choose to discuss, the information they share and the images they use to represent themselves, people with various disability can choose how they want the world to see them. In cases of visible disability, social media offers less of a personalization affordance as there is no possibility of creating an avatar in the same way as in virtual worlds.

4.4 Affordance: Social Inclusion

"The affordance "social inclusion" refers to the ability to experience feeling part of a community, creating and maintaining friendships, and experiencing close interpersonal relationships" (Stendal, 2014). In the physical world, people with disability experience challenges when wanting to socialize (Ballin and Balandin, 2007).

Virtual worlds offer the ability to meet as equals, which for people with disability may not be experienced in the physical world. One of the main reasons people with disability engage in virtual worlds is the social aspect they offer. Creating and maintaining connections, friendships, and close relationships are possible through virtual worlds, and the opportunity to communicate through various means (e.g., text and voice) offers people with disability a safe environment to explore the social connections they can encounter.

Social media offers the same ability to meet other people, create friendships and communicate, without the disability being visible in the same way as in the physical world. This is perhaps most true in social networks such as Facebook and Google+. However, it might be more of a challenge to create and maintain friendships with someone when text is the only communication medium available, and when there is no avatar to represent the user.

4.5 Affordance: Personal Development

"The personal development affordance is defined as the process of personal growth and learning" (Stendal, 2014). Feeling as being part of society and being able to give back and help others is important for people with disability in the physical world (Hammel et al., 2008).

Virtual worlds offer environments in which people with disability can be independent of outside assistance and take advantage of the mobility affordance. Through the mobility affordance, people with disability also can explore and take advantage of the personal development affordance identified through this research. Feeling as being part of society, being able to give back, help others, learning and an increased feeling of well-being through the virtual worlds, creates an added value for people with disability.

Social media offers different environments, which for some people with disability might offer personal development. Instagram can provide a sense of personal development for the visually inclined, and Facebook, Google+ and Twitter might provide the same for those who prefer to communicate through text. Especially for text-based communication, this requires a certain skill level. People with cognitive disability might not be able to crack the social code of Twitter, for example.

4.6 Affordance: Joint Activity

The affordance "joint activity" offers *"the ability to engage in activities together with others in the online environment"* (Stendal, 2014). Mennecke et al. (2010) stated the feeling of participating in a collaborative task increases the experience of virtual worlds and motivates for continuous use of the technology.

Virtual worlds offer an environment in which the feel of a physical world is present with exception of sense of smell or physical touch. Engaging in activities together with others was reported as an important factor for the participants. Over time, the participants began to feel immersed in the virtual world, not simply a person controlling the avatar. Most of the novice participants said they were impressed by the scenery and liveliness of the environment.

Social media provides users with some possibilities for joint activities. Most of these are text-based, such as discussions in a Facebook post or on Twitter. Instagram could be used for joint activities such as using hashtags to create a set of images or videos on a given topic, but again this would depend on the disability, and might also require some facilitation by a third party (especially in cases of intellectual disability).

5. Discussion – towards an affordance framework

We have examined the affordances offered by social media and virtual worlds for people with disability. As a response to Hammel et al.'s (2008) call for research on how to include people with disability in the wider society, we have chosen to focus on those social media that provides the combination of high self-presentation and medium to high social presence.

Our findings show that virtual worlds and social media to some extent can offer the same affordances for people with disability. However, for most of the affordances the differences in social presence between virtual worlds and other social media could be an indicator that social media presents these affordances to a somewhat lesser degree. Virtual worlds present the user with a richer experience, as the user navigates through a 3D representation of the physical world. The user also creates a 3D avatar to represent him or herself, which acts as a marker of identity. In social media, the user depends a lot more on the content that he or she creates and shares to create her own virtual identity and the possibility to move around is limited. As Bulu (2012) shows, user satisfaction is connected to social presence, the feeling of being in a "place" and co-presence with others. The sense of place is perhaps the presence lacking most in social media. Farzan et al. (2011) found that social media could create a sense of community as well, but that this requires more work

and imagination from the user to be successful. Thus, we argue that for people with disability, virtual worlds offer a richer experience due to their 3D immersive environment. On the other hand, social media still provides people with disability with some of the same benefits and with less of a barrier to entry.

We propose that social presence is only part of the equation. Equally important is the medium's complexity of use. Earlier studies have shown that virtual worlds are seen as less user-friendly than social media (Fetscherin and Lattemann, 2008, Cha, 2010). Simplicity – in terms of easy to understand user interfaces, a limited number of features and clear communication of user value is seen as essential (Constantinides and Fountain, 2008). This is reflected in the number of users of the different services. Second Life has around 57 million user accounts[1], while social media in total had 2.46 billion users in 2017[2]. A complex system can be a barrier for people with a certain disability, thereby excluding them from the affordances offered by the virtual world. The screen shots in figure 1 illustrate these differences in complexity between Second Life and Instagram. The most and least complex user interfaces in our study.

Figure 1: Screenshot of second Life and Instagram user interfaces

Several factors influence this potential complexity barrier. These factors are for example autonomy (Lane and Coleman, 2012), user confidence with technology in general (Venkatesh and Davis, 1996), whether the system itself provides the primary task the user seeks to accomplish (Gefen and Straub, 2000), as well as the level of encouragement from peers and sense of "being in the system" (Kwon and Wen, 2010). In Figure 2, we present a matrix of social presence and complexity of use for the services examined in this paper based on the simplicity criteria presented by Constantinides and Fountain (2008) – easy user interfaces, limited number of features and communication of user value.

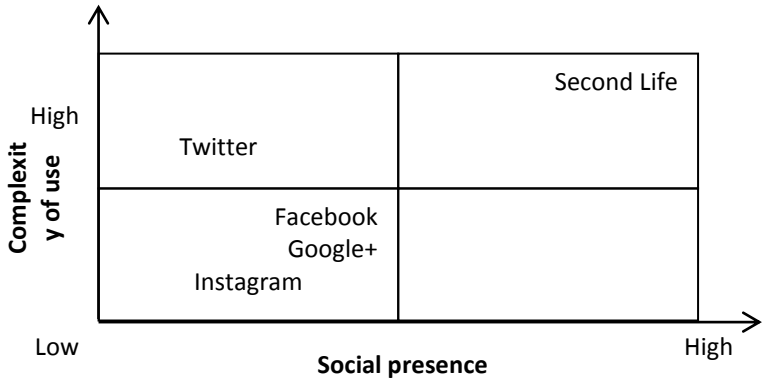

Figure 2: Matrix of social presence and complexity of use

[1]http://nwn.blogs.com/nwn/2018/04/second-life-15th-anniversary-infographic.html
[2] https://www.statista.com/statistics/278414/number-of-worldwide-social-network-users/

Second Life presents the highest level of social presence, but is also the most complex service to use, as it offers many features and a complex user interface. Second Life has many interface options in the form of buttons with unfamiliar symbols, drop-down menus, in-game chat function etc., which for the novice user can seem to be a daunting challenge to navigate when first entering the system. The features and options are many, and with little prior knowledge or help it can be difficult to answer the popular usability questions "what is this, what can I do here?" There are also additional challenges: You need a computer with enough processing power to run a 3D environment, meaning that many people will have to buy new and expensive equipment. Creating an avatar and understanding the environment (navigating, interaction with people and objects) is also challenging for many people, as this requires both knowledge and time.

Twitter has a lower level of social presence, mainly because users are limited to 140-character messages. We argue that Twitter is also a complex system to use effectively, due to culture and language issues that can be hard to understand for outsiders (Marwick and Boyd, 2011). Meaningful use of Twitter and other microblogging services require great care and effort (Ebner et al., 2010). However, Twitter's 140 characters limits the number of key strokes and makes more rapid communication (Hemsley, Palmer and Balandin, 2013), which makes Twitter a suitable medium for people with disability.

Facebook and Google+ are less complex to use than both Twitter and Second Life. You still have to register for an account and understand how to navigate the site (Boyd and Ellison, 2007), but there is no single culture to contend with, no avatar to create and no learning curve for integrating with objects. It offers a richer social presence than Twitter simply because you are not limited to short texts. You can post videos and photos, participate in groups and pages for various interests and on various topics and the rules of communication are less strict. The user interface is simple, providing you with a news feed and a prompt urging you to share your thoughts with the world. The number of features is limited, but to the novice user it can still be challenging to tell the difference between friends, pages, groups, events and applications.

Finally, content communities such as Instagram have an even lower complexity of use than Facebook and Google+. Access is through a smart phone app, which shows you step by step how to set up your account and how to get started with using the service. Social presence is also lower than Facebook, Google+ and Second Life, as the user is limited in what she can do with the application (post videos/photos, like and comment, use hash tags). For some users, especially those who express themselves visually, this could well be a reason for using these services.

5.1 Propositions for the creation of services aimed at people with disabilities

The only quadrant that is not represented in our model is the combination of high social presence and low complexity of use. As such, there is still room for developing social media that does an even better job at providing the affordances needed to help people with disability to be more included. The perfect solution does not exist. Instead, users must decide between social presence and complexity, with the more complex virtual worlds offering the highest levels of social presence. Thus, we present 5 propositions based on literature and the empirical findings presented above, which we hope can aid practitioners and future research endeavours in creating services aimed at increasing quality of life for people with disabilities:

Proposition 1: Social media-based services require a mature public organization. As services for people with disabilities involves several disciplines (health, communication, IT), maturity should be at least at stage 2 – coordinated chaos – in order to experiment with possible new services (Mergel and Bretschneider, 2013).

Proposition 2: Adoption of social media services require virtual presence, identity formation, accessibility and interaction (Alotaibi et al., 2016). For people with disabilities, this is even more important (Fisher, Peterson and Albert, 2015).

Proposition 3: User-involvement processes are needed to identify the needs of the user group (Holgersson, Axelsson and Melin, 2017).

Proposition 4: Designing good services for people with disabilities requires involvement of diverse stakeholder groups, especially groups concerned with wider public participation (Baker, Fairchild and Pater, 2012).

Proposition 5: Applying an affordance perspective in the user-involvement process helps identify both user needs and the technological possibilities of various systems.

Figure 3 summarizes and connects our five propositions. We argue that organizational maturity is an essential starting point, as it is highly difficult to achieve anything without this in place. Further, we suggest the four remaining propositions are equally important for creating services for people with disabilities.

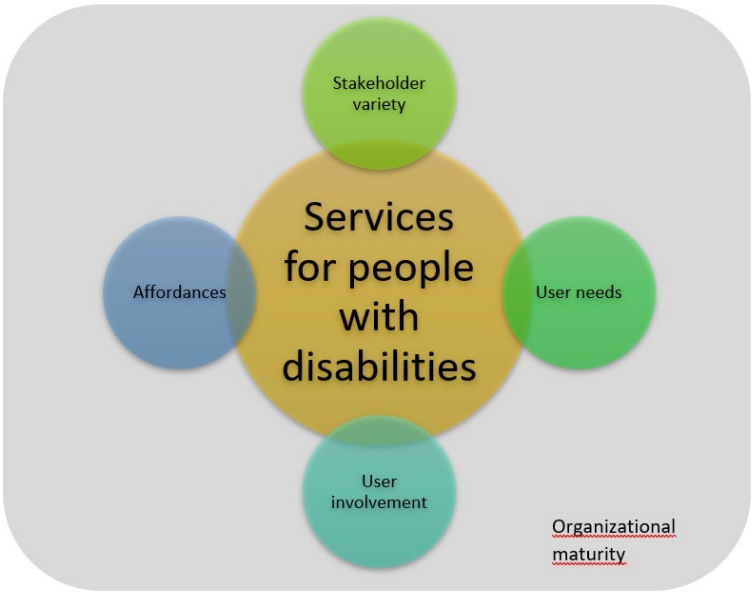

Figure 3: Framework model for creation of services for people with disabilities

6. Conclusion

In this paper, we have applied the concept of social affordances to virtual worlds and other social media. Our findings show that while many of the same affordances exist, social media with a lower social presence might not be quite as useful. Further, we have shown how high social presence can be more difficult to use compared to media with lower social presence. This indicates that learning and support is needed to take advantage of the high social presence medium of virtual worlds.

A limitation of this study is the lack of empirical evidence when comparing virtual worlds with other social media. This shows there is a need for future research to tackle this challenge. In addition, the identified affordances may not be the only affordances offered by virtual worlds and other social media. This needs further investigation. We suggest that future research should empirically investigate the affordances offered by social media to people with disability and find ways of combining the affordance perspective with usability studies to fill the void in the category high social presence/low complexity of use.

Further, future research should focus on specific disability groups and the challenges each of these groups face when using and participating through various social media. Finally, we suggest research into how to narrow the gap between high complexity and high social presence, to make the most useful channels available for more user groups.

References

Alotaibi, R., Ramachandran, M., Kor, A. and Hosseinian-Far, A., 2016. Factors Affecting Citizens' use of Social Media to Communicate With the Government: A Proposed Model. *Electronic Journal of e-Government,* 14(1)**,** pp. 60‑72.

Baker, P.M.A., Fairchild, A. and Pater, J., 2012. E-Accessibility and Municipal Wi-Fi: Exploring a Model for Inclusivity and Implementation. *In:* Susheel, C. (ed.) *ICTs for Advancing Rural Communities and Human Development: Addressing the Digital Divide.* Hershey, PA: IGI Global.

Baker, S.C., Wentz, R.K. and Woods, M.M., 2009. Using Virtual Worlds in Education: Second Life® as an Educational Tool. *Teaching of Psychology,* 36(1)**,** pp. 59-64.

Ballin, L. and Balandin, S., 2007. An exploration of loneliness: Communication and the social networks of older people with cerebral palsy. *Journal of Intellectual & Developmental Disability,* 32(4)**,** pp. 315-326.

Bloomfield, B.P., Latham, Y. and Vurdubakis, T., 2010. Bodies, Technologies and Action Possibilities When is an Affordance? *Sociology,* 44(3)**,** pp. 415-433.

Boyd, D.M. & Ellison, N.B., 2007. Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication,* 13(1)**,** pp. 210-230.

Bulu, S.T., 2012. Place presence, social presence, co-presence, and satisfaction in virtual worlds. *Computers & Education,* 58(1)**,** pp. 154-161.

Cha, J., 2010. Factors affecting the frequency and amount of social networking site use: Motivations, perceptions, and privacy concerns. *First Monday,* 15(12). Available at: < http://firstmonday.org/ojs/index.php/fm/article/view/2889/2685> [accessed: 7 Aug 2018]

Constantinides, E. and Fountain, S.J., 2008. Web 2.0: Conceptual foundations and marketing issues. *Journal of direct, data and digital marketing practice,* 9(3)**,** pp. 231-244.

Ebner, M., Mühlburger, H., Schaffert, S., Schiefner, M., Reinhardt, W. and Wheeler, S., 2010. Getting granular on twitter: tweets from a conference and their limited usefulness for non-participants. *Key Competencies in the Knowledge Society.* Berlin/Heidelberg: Springer.

Farzan, R., Dabbish, L.A., Kraut, R.E. and Postmes, T., 2011. Increasing commitment to online communities by designing for social presence. *Proceedings of the ACM 2011 conference on Computer supported cooperative work.* ACM: Hangzhou, China. Pp. 321-330.

Fetscherin, M. and Lattemann, C., 2008. User acceptance of virtual worlds. *Journal of Electronic Commerce Research,* 9(3)**,** pp. 231-242.

Fisher, K.M., Peterson, J.D. and Albert, J.D., 2015. Identifying state resources and support programs on E-Government websites for persons with intellectual and developmental disabilities. *Nursing research and practice,* 2015.

Fominykh, M., 2012. *Collaborative Work on 3D Educational Content.* PhD Thesis, department of Computer and Information Science, Norwegian University of Science and Technology.

Gefen, D. and Straub, D.W., 2000. The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption. *Journal of the Association for information systems,* 1**.** Pp. 1-28

Glăveanu, V.P., 2012. What Can be Done with an Egg? Creativity, Material Objects, and the Theory of Affordances. *The Journal of Creative Behavior,* 46(3)**,** pp. 192-208.

Hammel, J., Magasi, S., Heinemann, A., Whiteneck, G., Bogner, J. and Rodriguez, E., 2008. What does participation mean? An insider perspective from people with disabilities. *Disability & Rehabilitation,* 30(19)**,** pp. 1445-1460.

Hemsley, B., Palmer, S. and Balandin, S., 2013. Tweet reach: A research protocol for using Twitter to increase information exchange in people with communication disabilities. *Developmental Neurorehabilitation,* 0(0)**,** pp. 1-6.

Hoffmann, C.P., Lutz, C. and Meckel, M., 2014. *Social Media Readiness in Public Administration - Developing a Research Framework.* Available at: https://ssrn.com/abstract=2408737 [accessed: 7 aug 2018].

Holgersson, J., Axelsson, K. and Melin, U., 2017. External User Inclusion in Public e-Service Development: Exploring the Current Practice in Sweden. *In:* Janssen, M., Axelsson, K., Glassey, O., Klievink, B., Krimmer, R., Lindgren, I., Parycek, P., Scholl, H.J, Trutnev, D., ed. 16th IFIP WG 8.5 International Conference, EGOV 2017, 2017 St. Petersburg, Russia: Springer.

Hsieh, Y.P., 2012. Online social networking skills: The social affordances approach to digital inequality. *First Monday,* 17(4). Available at: <http://firstmonday.org/ojs/index.php/fm/article/view/3893> [accessed 7 aug 2018].

Huang, C.J., Usability of e-government web-sites for people with disabilities. 2003. *Proceedings of the 36th Annual Hawaii International Conference on System Sciences, 2003*. Hawaii: IEEE,

Jackson, S., 2006. Learning to live: the relationship between lifelong learning and lifelong illness. *International Journal of Lifelong Education,* 25(1)**,** pp. 51-73.

Jaeger, P.T. 2006., Assessing Section 508 compliance on federal e-government Web sites: A multi-method, user-centered evaluation of accessibility for persons with disabilities. *Government Information Quarterly,* 23(2)**,** pp. 169-190.

John, C.B. and Paul, M.B., 2012. Deploying Information and Communication Technologies (ICT) to Enhance Participation in Local Governance for Citizens with Disabilities. *In:* Susheel, C. (ed.) *ICTs for Advancing Rural Communities and Human Development: Addressing the Digital Divide.* Hershey, PA, USA: IGI Global.

Jones, K.S., 2003. What is an affordance? *Ecological Psychology,* 15(2)**,** pp. 107-114.

Jukić, T. and Merlak, M., 2017. The Use of Social Networking Sites in Public Administration: The Case of Slovenia. *Electronic Journal of e-Government,* 15(1)**,** pp. 2‑18.

Jung, Y. and Kang, H., 2010. User goals in social virtual worlds: A means-end chain approach. *Computers in Human Behavior,* 26(2)**,** pp.218-225.

Kaplan, A.M. and Haenlein, M., 2010. Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons,* 53(1)**,** pp. 59-68.

Kay, R., 2007. Quickstudy: Online Social Networks. *Computerworld,* 41(40)**,** pp. 56-56.

Krueger, A. and Stineman, M.G., 2011. Assistive Technology Interoperability between Virtual and Real Worlds. *Journal of Virtual Worlds Research,* 4(3).

Kwon, O. and Wen, Y., 2010. An empirical study of the factors affecting social network service use. *Computers in human behavior,* 26(2)**,** pp. 254-263.

Lane, M. and Coleman, P., 2012. Technology ease of use through social networking media. *Journal of Technology Research,* 3(1)**,** pp.1-12.
Leonardi, P.M., 2013. When does Technology use Enable Network Change in Orgainzations? A Comparative Study of Feature Use and Shared Affordances. *MIS Quarterly,* 37(3)**,** pp.749-775.
Lim, H.Y.F., 2009. Who Monitors the Monitor? Virtual World Governance and the Failure of Contract Law Remedies in Virtual Worlds. *Vanderbilt Journal of Entertainment & Technology Law,* 11(4)**,** pp.1053-1073.
Marwick, A.E. and Boyd, D., 2011. I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience. *New Media & Society,* 13(1)**,** pp. 114-133.
Mennecke, B.E., Tripplett, J.L., Hassall, L.M. and Conde, Z.J., 2010. Embodied Social Presence Theory. *43rd Hawaii International Conferance on System Siences*, Hawaii, US, 2010.
Mergel, I. and Bretschneider, S.I., 2013. A Three-Stage Adoption Process for Social Media Use in Government. *Public Administration Review,* 73(3)**,** pp. 390-400.
Milner, P. and Kelly, B., 2009. Community participation and inclusion: people with disabilities defining their place. *Disability & Society,* 24(1)**,** pp.47-62.
Morgan, J. and Balandin, S., 1997. Adults with cerebral palsy: What's happening? *Journal of Intellectual & Developmental Disability,* 22(2)**,** p.109.
Orlikowski, W.J. and Iacono, C.S., 2001. Research Commentary: Desperately Seeking the "IT" in IT Research--A Call to Theorizing the IT Artifact. *Information Systems Research,* 12(2)**,** pp.121-134.
Park, H. and Song, H.D., 2015. Make e-learning effortless! Impact of a redesigned user interface on usability through the application of an affordance design approach. *Journal of Educational Technology & Society,* 18(3)**,** pp. 185-196.
Patton, M.Q., 2002. *Qualitative Research & Evaluation Methods*, SAGE Publications.
Prasolova-Forland, E., 2012. 3D visualizations for supporting social awareness in learning communities. *ICONS 2012, The Seventh International Conference on Systems, 2012*. Reunion Island. 2010.
Renblad, K. 2003., How do people with intellectual disabilities think about empowerment and information and communication technology (ICT). *International Journal of Rehabilitation Research,* 26(3)**,** p. 175.
Stendal, K., 2014. *Virtual world affordances for people with lifelong disability.* PhD thesis, University of Agder, Department of Information Systems, University of Agder.
Sutcliffe, A., Gonzalez, V., Binder, J. and Nevarez, G., 2011. Social mediating technologies: social affordances and functionalities. *International Journal of Human-Computer Interaction,* 27(11)**,** pp.1037-1065.
Tursunbayeva, A., Franco, M. and Pagliari, C., 2017. Use of social media for e-Government in the public health sector: A systematic review of published studies. *Government Information Quarterly,* 34(2)**,** pp. 270-282.
Venkatesh, V. and Davis, F.D., 1996. A model of the antecedents of perceived ease of use: Development and test*. *Decision sciences,* 27(3)**,** pp.451-481.
Verdegem, P. and Verleye, G., 2009. User-centered E-Government in practice: A comprehensive model for measuring user satisfaction. *Government Information Quarterly,* 26(3)**,** pp.487-497.
Walsham, G., 2006. Doing interpretive research. *European Journal of Information Systems,* 15(3)**,** pp.320-330.
Who., 2015. *Disabilities*. World Health Organization [Online]. Available at: <http://www.who.int/topics/disabilities/en/> [Accessed 05.October 2015].