Effective Use of Self-service Technology by Physically Disabled Individuals

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Abstract

Vulnerable communities create significant challenges for service providers. However, the use of self-service technologies can play an important role in meeting the needs of physically disabled individuals as the service sector strives to reduce the growing costs of providing customized services, while also trying to control costs and maintain service quality. Facilitating self-service technology use by people with disabilities may help them to live more independently and enhance their quality of life. It may also save costs for service providers through reduced use of service employees in service encounters. To this end, this research-in-progress paper provides the conceptual foundation for a study that aims to explore the impact of technology-based service use by this community on their wellbeing.

Keywords

Social support quality, customized personalization, physical disability, self-service technology, self-service technology effectiveness, psychological well-being

1   Introduction

As technology plays an increasingly greater role in self-service delivery, its potential effect on empowering people with disabilities has, unsurprisingly, become a focus of research and is also a public and private service sector concern. The development of technology-assisted services that enhance the quality of life and increase economic and social participation of people with disabilities is among the national priorities of governments across the world. From a scholarly perspective, transformative services research places significant emphasis on consumers' wellbeing (Rosenbaum et al. 2011) and in general sheds light on the importance of personalised technology-based services for vulnerable communities (Anderson et al. 2013).

Furthermore, psychiatric research has shown that poor psychological wellbeing and depression can contribute strongly to impairment leading to excessive service utilization (Beekman et al. 1997). In the context of effective technology-based service delivery to people with physical disabilities, this notion highlights the importance of considering users' psychological needs in addition to their utilitarian goals. To address this important matter, this study explores antecedents, as well as psychological and utilitarian outcomes of effective self-service technologies for use by individuals with physical disabilities.

The psychological and utilitarian benefits of self-service technologies (SSTs) will not actualize unless they are used continuously and effectively by potential users (Hsieh et al. 2008). One of the major drawbacks of technology-assisted services is their limited adaptability to real-time and context-specific intrinsic and extrinsic aspirations of consumers. Further, one-size-fits-all technology-based services may not always facilitate achieving goals and satisfying psychological needs. For SSTs to be used continuously and effectively, research and practice have demonstrated the importance of personalizing SSTs and increasing their socialness (e.g. Bettencourt and Gwinner 1995; Verhagen et al. 2014).

There has been a great deal of research investigating the influence of using social cues on user satisfaction with and intention to use self-service technologies (e.g. Song and Zinkhan 2008; Tam and Ho 2005; Verhagen et al. 2014; Wang et al. 2007; Zhu et al. 2007). There has also been large amounts of research on the role of SST characteristics (e.g. ease of use, fun, and usefulness) in creating feelings of delight and enhancing the likelihood of SST use (Rogers 1995). Moreover, there exists some research examining the influences of intrinsic and extrinsic motivation on SST use (e.g. Burke 2002; Hsieh et al. 2008; Meuter et al. 2005; Oyedele and Simpson 2005; Reinders et al. 2008). None of this literature, however, focuses on the needs and aspirations of people with physical disabilities.

The goal of this research is to examine the influence of personalization and socialness of self-service technologies designed for individuals with physical disability on user evaluations of the effectiveness of these technologies. This research also aims to explore the consequent psychological and utilitarian outcomes of continued use of personalized and social self-service technologies. This work has the potential to pave the way for people with disabilities to live a more independent life, for longer, through the use of self-service technologies and may lead to an improved sense of personal well-being. More specifically, we aim to answer the following questions:

1)   Does the quality of technology-based service personalisation and the quality of social support during a technology-based service encounter influence effective SSTs use by people with physical disabilities? Does this vary for people with different intrinsic motives?

2)   How do the quality of technology-based service personalisation and the quality of social support during technology-based service encounters influence the wellbeing of individuals with physical disabilities?

2   Contribution to Theory

By answering the listed research questions we will contribute to the literature in several ways: First, our research extends the consumer technology use literature by providing a more comprehensive view of the possible psychological outcomes of SSTs use. We will examine how personalization of core services and quality of social support during a technology-based service encounter might affect psychological wellbeing— a state which is derived by feelings of pleasure, beliefs of autonomy, independence, relatedness and companionship.

Second, our research is among the first to examine the effects of social support quality during a technology-based service encounter for consumers with disabilities. The majority of research in this stream focuses on either the influence of social cues such as a smile by a service employee or the effect of social presence of consumer technologies on SSTs use. However, it may not only be the degree of personalness of the technology-based services which might encourage users to use a given SSTs, but also the quality of this social support. Our research explores the effect of social support quality provided by a service employee during a technology-based service encounter on SSTs use and psychological and utilitarian outcomes.

Third, in addition to the social aspect of personalization quality of SSTs, we will examine the influence of the level of adaptation of the actual service offerings to people with disabilities. In particular, the majority of research examining the effects of personalization on SSTs patronage does not clearly distinguish between service offering adaptation and interpersonal adaptation. Our research explores the consequences of both types of personalization (i.e. quality of social support and the level of customized personalization) on perceptions towards the quality of SSTs and their continued use at the same time.

Finally, our study extends the literature by exploring both the utilitarian and the psychological outcomes of SST use. The existing research examines post-use perceptions towards usefulness and enjoyment of consumer technologies after episodes of technology use. However, little research exists examining to what extent users achieved their utilitarian goals. Our study extends the literature by exploring how the degree of achieving utilitarian goals varies based on different levels of customized personalization and the quality of social support provided through self-service technologies designed for individuals with physical disabilities.

3   Conceptual Background

3.1   Customized Personalization Quality

Customized personalization is based on the desire to adapt the core service offering for a consumer's real-time needs. This type of person-centred and goal-focused attention has shown by research to enhance consumers' confidence that they received the best offering designed to address their needs (Surprenant and Solomon 1987). We suggest that customized personalization may play an important role in helping people with physical disability to achieve their utilitarian goals and live independently.

Providing personalised technology-based assistance with every-day tasks such as managing money, finding accommodation, grocery shopping, finding a job, organizing medical and general health appointments, or making new friends are examples of possible utilitarian values of SSTs for people with physical disabilities. It is of interest to determine if personalization of technology-based services with the goal of enhancing quality of life for individuals with a physical disability and facilitating their economic and social participation in society can influence user evaluations of and decisions to use SSTs.

3.2   Social Support Quality

Albrecht and Adelman (1987) referred to social support as 'verbal and nonverbal communication between recipients and providers that reduces uncertainty about the situation, the self, the other, or the relationship and functions to enhance perception of personal control in one's experience' (page 19). Due to limitations in mobility, communication, or access, receiving face-to-face social support may be problematic for people with disabilities (Matt and Butterfield 2006; Olkin 1999; Finn 1999). Therfore, technology-mediated social support can be an attractive option for this community.

There are several classifications of social support. In regards to social support for people with disability in a computer-mediated environment, Braithwaite et al. (1999) identified five categories.   He considered emotional support, esteem support, network support, information support, and tangible assistance as different types of social support messages received in computer-mediated groups. Most research on online or computer-mediated social support, however, revolves around different types of support from families or friends or support from support groups and networks (e.g. Obst and Stafurik

2010). In our study, we approached social support quality as the level of emotional and esteem support a service employee provides to a person with disability during a technology-based service encounter.

Research in the areas of information systems and technology-based service sheds light on the role of socialness, friendliness, and communication styles (Verhagen et al. 2014) in self-service technology appraisals and use. In addition to customization and quality of the core service, research suggests that for some services and/or for some people degrees of socialness can have an impact on attitudinal and behavioural perceptions towards self-service technologies (Verhagen et al. 2014). As part of our research we explored how quality of social support, provided by the service employee during a technology-based service encounter, might affect effective SST use and psychological wellbeing of individuals with physical disability.

3.3   SST Effectiveness

Resource-matching theory explains under what conditions cognitive tasks can be best achieved (Anand and Sternthal 1990). According to this theory, the outcome of cognitive tasks is optimized when cognitive resources consumers make available to carry out the task are matched by mental elaboration demanded by the task. If cognitive resources either exceed or fall blow required amount of elaboration, effectiveness of these tasks is weaker. Furthermore, the Elaboration Likelihood Model (Petty and Cacioppo 1986) suggests that people put more effort in information processing when they are motivated and engaged.

Informal conversations and friendliness personalization has shown by research to lead to favourable evaluations of service experience, in general (Verhagen et al. 2014). However, not all consumers may be willing to put cognitive effort to participate in conversations service employee make to provide emotional support. For them receiving the core service and achieving utilitarian outcomes may be more important. Similarly, research shows that personalized messages vs. standard messages have a positive effect on perceived control and attitude towards SSTs (Song and Zinkhan 2008). However, not all consumers may appreciate service offering adaptation due to high amount of cognitive effort required between consumers and the service employee (Bettencourt and Gwinner 1995; Surprenant and Solomon 1987). This might be particularly true for routine services.

For people with physical disability, however, we suggest customized personalization and high quality social support are highly relevant to meet their psychological and utilitarian goals. In line with these two theories, we suggest that social support quality and customized personalization quality may vivify cognitive capacity of people with physical disability and thereby might enhance their perceived level of control and their evaluations towards SST—two key aspects of SST effectiveness identified in the SST literature (Zhu et al. 2007). This might be particularly true for those whose physical disability prevents them from socializing and meeting with people on a routine basis and/or for those with low level of self-efficacy (Braithwaite et al. 1999). In sum, we propose that:

H1: There is a positive relationship between customized service personalization quality and SST effectiveness.

H2: There is a positive relationship between social support quality and SST effectiveness.

3.4   Self-determination Theory

Self-determination theory is a theory of motivation that addresses three innate psychological needs of relatedness, competence and autonomy (Ryan and Deci 2000). The theory asserts that people will function and grow favourably if these three needs are met. Intrinsic goal framing has shown to result in deeper engagement in activities, and higher likelihood of persistence at activities (Vansteenkiste et al. 2006).

Furthermore, the theory argues that with intrinsic motivation, people tend to do something purely because of enjoyment or fun. In other words, individuals are intrinsically motivated to do activities

which help them address their intrinsic needs. With extrinsic motivation, in contrast, an individual tends to participate in an activity or task because doing so will result in an extrinsic benefit or reward.

One of the assumptions of SDT is that the quality of social contexts plays a role in motivation and performance of people who operate within them. Based on SDT, autonomy support from social environment, for example, tends to facilitate intrinsic motivation, optimal function and healthy development.

In the discussion of adapting SSTs characteristics to satisfy the intrinsic needs of consumers, the existing SSTs research has focused on hedonic aspects (Venkatesh et al. 2012; Hsieh et al. 2008). To design more person-centred assistive technology solutions for people with physical disabilities, however, considering other aspects of intrinsic motives (Ryan & Deci 2000) might also be relevant. Friendly social support during a technology-based service encounter may for example, play a role in creating a sense of companionship and being cared for in physically disabled consumers.

While the need for relatedness is generalizable to any person, its salience for influencing decisions and judgments could be more important for people with physical disabilities. This might be particularly true for those whose physical disability prevents them from socializing and meeting with people on a routine basis. Moreover, a technology-based service might provide emotional and autonomy support (Braithwaite et al. 1999) through the use of social cues and/or adaptive behaviours by service employees during a technology-based service encounter.

In addition to its possible psychological value, technology-based services characterised by high levels of service offering customization might facilitate the actualization of utilitarian goals of disabled consumers by adapting their core services based on the real time needs of individuals .This may be an attractive solution for members of the physically disabled community who strive for autonomy and control in their decisions on the one hand and require encouragement and assistance to be able to live independently on the other hand. In sum, relying on SDT, we propose that:

H3: There is a positive relationship between the level of customized personalization of technology-based self-service and SST use by people with physical disability.

H4: There is a positive relationship between quality of social support during a technology-based self-service and SST use by people with physical disability.

H5: There is a positive relationship between the level of customized personalization of technology-based self-service and attainment of utilitarian goals by people with physical disability.

H6: There is a positive relationship between quality of social support during a technology-based self-service and attainment of utilitarian goals by people with physical disability.

H7: There is a positive relationship between SST effectiveness and SST use by people with physical disability.

H8: There is a positive relationship between SST effectiveness and attainment of utilitarian goals by people with physical disability.

H9: There is a positive relationship between SST use by people with physical disability and attainment of utilitarian goals.

3.5 Psychological Wellbeing

According to SDT, the social environment and tasks which facilitate nurturing intrinsic needs of autonomy, competence and relatedness are shown to enhance psychological well-being (Forgeard et al. 2011; Ryan and Deci 2000). One of the tenets of SDT is that satisfaction of these three psychological needs leads to gaining intrinsic values that are an essential part of human nature. Cultivating, pursuing, and reaching such aspirations, therefore, is known to increase wellbeing (Reis et al. 2000). Therfore, we suggest that:

H10: There is a positive relationship between the level of customized personalization of technology-based self-service and psychological wellbeing of people with physical disability.

H11: There is a positive relationship between quality of social support during a technology-based self-service and psychological well-being of people with physical disability.

H12: There is a positive relationship between SST effectiveness and psychological well-being of people with physical disability.

In addition to intrinsic motives, extrinsic motives, particularly those characterised with high levels of autonomy, are shown to have an effect on behavioural effectiveness and volitional persistence. In particular, research suggests that the attainment of autonomous utilitarian goals can, also, lead to psychological well-being (Forgeard et al. 2011).

For people with physical disability, attainment of utilitarian goals can be highly relevant to achieving intrinsic aspirations of relatedness, autonomy and competence. Being able to work, learn, socialize, and, carry out everyday tasks more independently, for example, may lead to higher self-evaluations in terms of competence, autonomy and relatedness for this community. Therfore, we suggest that:

H13: There is a positive relationship between the degree of utilitarian goal attainment and Psychological well-being of people with physical disability.

3.6   Control Variables

Levels of psychological needs may vary among individuals in different situations. We will further explore how our proposed conceptual model (Figure 1) may vary for people with disability depending on their levels of need for competence, autonomy and relatedness. We will also examine how demographics (age, gender, and type of disability) may affect these results.
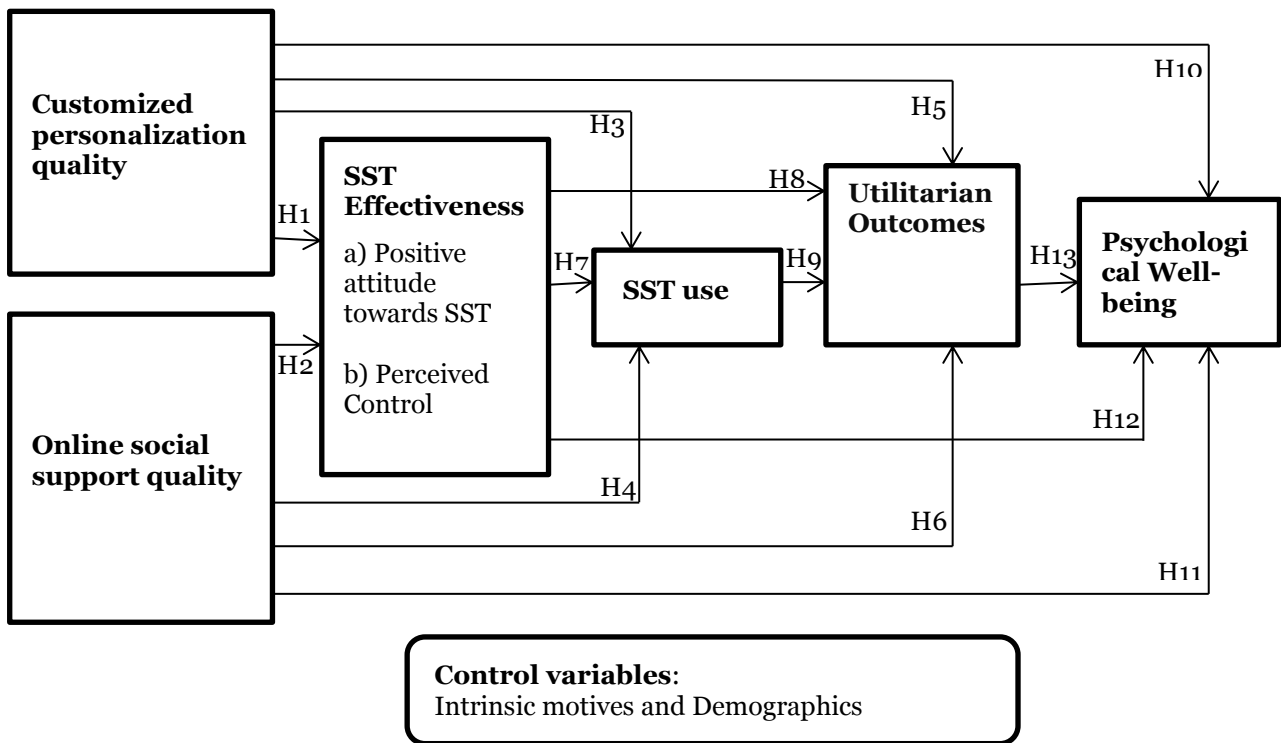

Figure 1: Effective Use of Self-service Technology by physically disabled individuals

4   Methodology

To address the research questions, this study proposes a mixed methodology that includes an exploratory stage and an explanatory stage. During the exploratory stage, we will define and elaborate upon unknown variables through the use of focus groups. More specifically, we will explore the relevant dimensions of quality of social support, quality of customized personalization and SST effectiveness in the context of technology-based services aimed at people with physical disabilities. We will also explore the nature of the common utilitarian goals of people with physical disabilities.

In the explanatory stage, the insights from the exploratory phase will be used to design scenario-based simulation experiments. Through this explanatory stage, we will experimentally determine the influence of different customized personalization and social support strategies on user judgments of SST effectiveness and decisions to use SSTs. We will also examine how high vs. low levels of social support quality and customized personalization as perceived by participants with physical disabilities influences psychological outcomes such as self-evaluative appraisals about autonomy, competence and relatedness. Furthermore, we will examine the extent to which respondents believed they achieved their utilitarian goals after participating in the experiments. Moreover, we will examine the possible moderating effects of respondents' intrinsic motives, type of their disability, and demographics.

Finally, to examine the causal links between perceptions of quality and effective SST use, as well as perceptions of quality on personal subjective wellbeing, we would ordinarily propose conducting a longitudinal study.

Primary data will be collected through the use of focus group studies with students who have physical disabilities at the University of Canberra (UC) and the Australian National University (ANU). For stage two of the research, behavioural experiments will be undertaken in a behavioural lab at ANU. Before participating in scenario-based experiments, data on participants' demographics (age, gender and type of physical disability), their intrinsic motives (need for self-reliance, need for autonomy, need for relatedness, SST-related self-efficacy), as perceived by respondents will be collected.

Next, participants will be randomly exposed to simulated scenario-based experiments. After participating in each experiment, their perceptions towards quality of social support, quality of customized personalization, quality of SSTs, their likelihood of using the technology in the future, their perceived level of autonomy, competence and relatedness, and finally the extent to which they believe their extrinsic goals were achieved will be measured. The data collection instrument will be a self-administered, computer-based questionnaire to be answered after being exposed to each scenario in the computer lab.

5   Conclusions

Our program of research will help to address Australian National Disability Insurance Scheme's priorities about improving the lives of people with disabilities through person-centred and goal-focused technology-based services. Findings from our research will provide guidance on how to enhance the quality of technology-based services and the quality of technology-based social support so that people with disabilities can effectively use self-service technologies and achieve utilitarian and psychological outcomes. In addition to providing solutions for enhancing the quality of technology-based solutions with the goal of generating economic and social value for people with disability, our research can play a significant role in generating economic value for the scheme. The effective use of self-service technologies by people with disabilities may lead to cost savings for service providers through the reduced use of service employees in service encounters.

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