

The Digital Natives' paradox: Adoption of Telemedicine Cabin

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Abstract:

Some countries need to face a major issue with the lack of physicians or health infrastructures. E-health could be the answer. The purpose of the paper is to measure the impact of Perceived Personalization, Compatibility and Self-Efficacy on the Intention to Use Telemedicine Cabin by Digital Natives. Teleconsultation may cause uncertainty especially regarding personal data disclosure or risks such as the level of quality of service provided by remote technology. Thus, the aim of the study is also to check the influence of Perceived Risk and Privacy Concern. A questionnaire was administrated to 150 students of French Business School. Results, analyzed using a PLS approach, highlight the paradox in the acceptance of Telemedicine Cabin by Digital Natives. Findings can be used by healthcare professionals to remove uncertainty about the quality of service.

Keywords: Telemedicine, Digital Natives, Technology adoption, Intention to Use, Perceived Risk, Privacy Concern, Perceived Personalization, Compatibility, Self-Efficacy

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INTRODUCTION

Digital Natives are considered as more sensible to innovative technology acceptance or new consumption modes (Prensky, 2001; Kaplan & Haenlein, 2016). Several studies highlight within different countries the fact, that young adults (18-25 years old), and more precisely students, are more reluctant to consult, and do medical analysis than the rest of the population (Deeks et al., 2009). Several explanations can be raised (1) they have potentially less health issues than digital immigrants (born before 1981) (2) students have a lack of time and availability due to their studies and (3) their referring physician is sometimes far away from the place they study and due to the decreasing numbers of physicians some of them refuse to take new patients. Thus, the implementation of Telemedicine Cabin (TC) within Universities or Business Schools could be an accurate solution. (Bice-Urbach & Kratochwill, 2016; Lepore, et al., 2018).

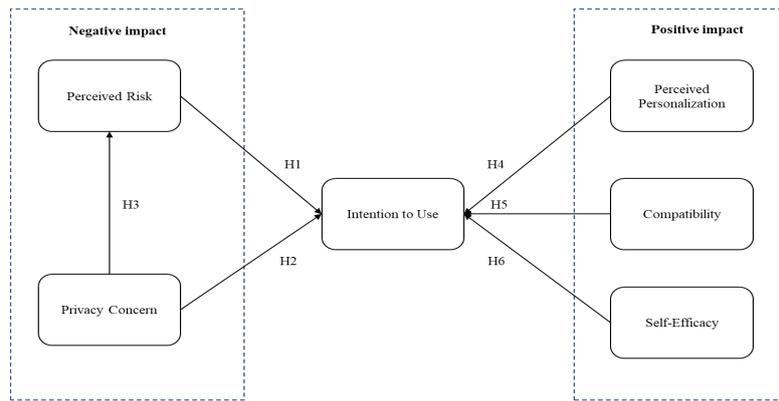
This research focuses on the Telemedicine Cabin (TC), a new Information and Communication Technology solution in a health context, allowing teleconsultations, eliminating travel time and reducing costs for both patients and practitioners, and lowering the waiting time of medical appointments (Simon & Lucas, 2014; Simon, 2016; Bennett, Vijaygopal & Kottasz, 2019). The TC is equipped with measuring devices. The patient must follow the different instructions as indicated by the physician and use the available devices inside the cabin to measure weight or temperature, to test visual acuity and hearing, to do an electrocardiogram etc. The results are instantly communicated to the physician who can, if needed, deliver prescriptions that will be printed inside the cabin.

The objective of the research is to address the acceptance of the TC by students as Digital Natives. Our sample is composed of students from different Business Schools located in France. The article is organized as follows. First, the literature review and the hypotheses are presented. Second, the methodology is explained, and results analysed. Third, the findings are discussed, and the theoretical and managerial implications are highlighted. Finally, some limitations of the study and propositions for future researches are suggested.

THEORETICAL BACKGROUND AND RESEARCH MODEL

The goal of the research is to measure the potential impact of variables such as Perceived Personalization, Compatibility, Self-Efficacy, Privacy Concern, and Perceived Risk on Intention to Use (ITU), this central construct is often used for the Technology Acceptance. The model (Figure 1) was built considering the specific context of health and more precisely the TC. Variables are segmented depending on their positive or negative impact on ITU. First the negative impacts will be presented (Perceived Risk & Privacy Concern), followed by the positive impacts (Perceived Personalization, Compatibility & Self-Efficacy).

Figure 1: Research model



Perceived Risk

Perceived Risk stands for “*consumer’s perceptions of uncertainty and adverse consequences of buying a product (or service)*” (Dowling & Staelin, 1994, p.119). The reasons of variation of risks and uncertainties, concerning usage of IT, vary significantly among patients and doctors (Dixon, 2007). Four antecedents of Perceived Risk can be distinguished: psychological, financial, time, and product or performance risks (Casidy & Wymer, 2016). In the specific domain of Telemedicine, we define Perceived Risk for patients in terms of Psychological and Performance Risks (Polites & Karahanna, 2012). The Performance Risk is the perception of a potential unavailability of adequate information implying a negative impact on diagnostic or treatment (Suh & Han, 2003) or loss of confidential/sensible information used without patient’s agreement. The Psychological Risk is the perception of a lack of mental satisfaction (not aligned with user’s values or self-image) and even discomfort (lack of time due to the potentials difficulties to use). Several studies analysed, the impact of Perceived Risk on dependant variables such as Trust in e-health records solution (Ortega Egea et al., 2011), or e-commerce adoption (Gefen, 2000). Former researches have confirmed that Perceived Risk and Intention to Use are negatively associated (Pavlou & Gefen, 2004; Lee & Tan, 2003; Pavlou, 2003). This negative relation can be explained by different parameters : (1) when the results is far away from user’s expectation (Pavlou, 2003), (2) the lack of face-to-face interaction that can induce a feeling of uncertainty and risk (Wu & Chen, 2005), (3) the inability to physically inspect/touch products (Bhatnagar & Ghose, 2004, Featherman & Pavlou, 2003), or (4) when the users’ experience is quite different from previous way of consumption of products or services (Belkhamza & Wafa, 2014). Therefore, authors suggest that:

H1: Perceived Risk has a direct, negative and significant impact on Intention to Use TC.

Privacy Concern

Privacy Concern (Bawack & Kamdjoug, 2018; Duarte & Pinho, 2019) is often mobilized to examine the acceptance of e-health or telemedicine services and is considered as the main issue in the literature within e-health domain (Bansal & Gefen, 2010). The antecedent factors of Privacy Concern can be divided into five levels: individual, organizational, social-relational, macro-environmental, and informational (Li, 2014, Xu, et al., 2009). For the purpose of the research, a focus has been made on the individual perspective of Privacy Concern such as demography, personality, knowledge, experience, and psychology (Hossain & Dwivedi, 2014). If a user is not reassured about the safety of his information within an online health care

program, he/she might have a lower Intention to Use a telemedicine system and even become reluctant to adopt it (Kirchbuchner, *et al.*, 2015; Hossain & Prybutok, 2008). Telemedicine and e-health services are quite new, and customers remain uncertain about the providers' behaviour and retain some doubts concerning potential misuse of their information. Some researchers regarded Privacy Concern as the antecedent of Perceived Risk (Van Slyke *et al.*, 2006). Thus, authors postulate that:

H2: Privacy Concern has a direct, negative and significant impact on Intention to Use TC.

H3: Privacy Concern has a direct, positive and significant impact on Perceived Risk

Perceived Personalization

Personalization is an important component of digital services (e.g.: Akter *et al.*, 2013, Cocosila and Archer, 2010; Sun *et al.* 2013, Xu, *et al.*, 2009) integrating two different concepts: Actual Personalization and Perceived Personalization. Actual Personalization occurs when a message sender modifies a generic message (product or service) to adapt the content to a specific recipient, while Perceived Personalization measures if the recipient perceives the message (product or service) as fitting with his/her preferences. Therefore, the services proposed by providers are based on individuals' preferences, tastes, personal behaviours or geographical location (Salo & Karjaluoto, 2007 ; Guo *et al.*, 2016). In the health domain, Perceived Personalization refers to the feeling that the health services and/or products can answer patients' needs especially in case of specific diseases (Komiak & Benbasat, 2006; Sheng *et al.*, 2008; Ho & Bodoff, 2014). Perceived Personalization is a key variable and strongly impacts the Intention to Use telemedicine. Thus, authors hypothesize that:

H4: Perceived Personalization of TC has a direct, positive and significant impact on Intention to Use TC.

Compatibility

Compatibility is the degree to which technology is perceived by potentials users to be consistent with their values, experience, and needs (Rogers, 1995; Jang, Kim, & Lee, 2016). Furthermore, Tung, Chang and Chou (2008) explained users' adoption behaviour of IT products based on TAM and compatibility. Asua, Orruno, Reviriego and Gagnon (2012) applied similar model of TAM and compatibility in telehealth context by investigating the acceptance intention among healthcare staff. Their results showed a positive influence of Compatibility on Perceived Usefulness and Intention to Use. Therefore, authors, postulate that:

H5: Compatibility has a direct, positive and significant impact on Intention to Use TC

Self-Efficacy

Self-Efficacy is the general belief of an individual that he could solve problems and lift obstacles by himself or with the support of someone else to reach final goals (Bandura, 2010). A high degree of Self-Efficacy will enhance the Intention to Use a technology especially in the health sector (Luszczynska & Schwarzer, 2005). Indeed, individuals with a high level of Self-Efficacy will be less reluctant to do enough effort to successfully reach their targeted objective (Stajkovic & Luthans, 1998). One of well-known scales to measure this feeling is the generalized Self-Efficacy Scale (GSE) composed of ten items developed by Schwarzer and Jerusalem (1995). Bonsaksen *et al.* (2013) analysed the impact of Self-Efficacy in case of morbid obesity. Self-

Efficacy is understood as being domain-specific even if some researchers have conceptualized a general sense of Self-Efficacy that refers to global confidence (Sherer & Maddux, 1982). Thus, authors suggest that:

H6: Self-Efficacy has a direct, positive and significant impact on Intention to Use TC.

METHODOLOGY

A quantitative approach was selected, the questionnaire was build using items adapted from existing scales (Table 1).

Intention to Use	Venkatesh et al., 2012
Perceived Personalization	Komiak & Benbasat 2006
Compatibility	Taylor & Todd, 1995
Self-Efficacy	Bonsaksen et al., 2013
Perceived Risk	Ortega Egea et al., 2011
Privacy Concern	Featherman & Pavlou 2003

Table 1: Research model scales

The survey, created on google form, was administrated to students of French Business Schools (Digital Native population), volunteering to answer. The Partial Least Approach was mobilized to analyse the 150 questionnaires collected. The sample is at 77 per cent composed by women. Indeed, women are often more concerned about subjects related to health or wellness (Baudier *et al.*, 2018).

RESULTS

The Alpha's Cronbach and the composite reliability values confirm the reliability of the research model. The convergent validity was controlled by verifying that all Average Variance Extracted of our constructs were above 0.5. The analysis of the cross loadings confirms the discriminant validity. The relationships between variables were controlled by verifying that the Path Coefficients were above the threshold of 0.200, the t-values above 1.96 and p-values below 0.05 (Table 2). The R^2 at 0.553 demonstrates that the model explains 55.3 per cent of Intention to Use determined by Compatibility with a huge size effects ($f^2=0.351$) and by Self-Efficacy. The analysis also confirmed the negative impact of Perceived Risk on the Intention to Use. Nevertheless, the impact of Perceived Personalization and Privacy Concern on Intention to Use is rejected. In addition, Privacy Concern explained 22 per cent of Perceived Risk with a huge size effect ($f^2=0.282$). The predictive relevance of the research model was tested using the blindfolding procedure. The Q^2 of Intention to Use (0.406) and Perceived Risk (0.231) confirm the good relevance of the model. Finally, the quality is confirmed by the Standardized Root Mean Square Residual below 0.1 (0.060), the Normed Fit Index closed to one (0.819) and the RMS Theta closed to zero (0.206). Thus, four hypotheses are validated (H1, H3, H5 and H6), and two are rejected (H2 et H4) (Table 2).

Construct	Predictor variable	R^2	f^2	Path Coef	T Value	P Value	Q^2	H
ITU		0.553					0.389	

	PR		0.063	(-0.206)	2.669	0.008		X
	PC		0.008	(-0.067)	1.052	0.293		O
	PP		0.000	0.005	0.066	0.947		O
	COM		0.351	0.513	7.058	0.000		X
	SE		0.094	0.233	3.565	0.000		X
PR		0.220					0.231	
	PC		0.282	0.469	7.015	0.000		X

Table 2: Outer model

The moderating effect of gender on the relationships of the model was tested using the Multi-Group Analysis procedure, proposed by Smart PLS3 software suitable for small samples. Indeed, Hair et al (2011) recommend multiplying by 10 the number of items of the variable with a maximum of items. Therefore, for our model, a minimum sample of 30 is recommended and the sample for men is composed of 44 respondents. No moderating effect have been highlighted except for the relationship between Self-Efficacy and Intention to Use when the impact is significant, positive and direct for women (Path coefficient=0.283, t-value=3.711, p-value=0.000) and rejected by men (Path coefficient=0.167, t-value=1.267, p-value=0.205).

DISCUSSION AND CONCLUSION

This study addresses substantial gaps in the telemedicine literature regarding the adoption of e-health solutions. Results confirmed that Digital Natives are confident with internet technologies and are not concerned about the disclose of personal information (H2 Privacy Concern rejected). Indeed, Digital Natives tend not to protect enough their privacy especially when using social networks. They publish online a lot of personal information. This finding contradicts the study done by Lee et al. (2019) highlighting that the population between 20-40 years old are more concerned about privacy than the oldest generation. Nevertheless, for both a remote and face-to-face consultation, physician is subject to confidentiality, this is certainly the reason why. Moreover, the higher is the usefulness perception of the technological product or service, the lower is the negative effect of Privacy Concern. Sometimes, this impact could be even inexistent (Li, 2014). Respondents consider having the technical background to use TC (H6 Self-Efficacy validated), and using a TC is aligned with their lifestyle (H5 Compatibility validated). However, this research highlights a technological paradox (Awad & Krishnan, 2006; Guo et al., 2016). Indeed, Digital Natives demonstrate no issue to use remote technology, part of their daily life. Nevertheless, they have rejected the relationship between Perceived Personalization and Intention to Use a TC (H4) considering that physicians can't understand and answer their needs remotely. Results are emphasised by the validation of Perceived Risk (H1) confirming their doubts about remote diagnostics and the fear regarding the lack of time. Indeed, they will have, each time, to present themselves and explain again their problem to new physician when this is not necessary with their usual physician. This finding, aligned with other researches, demonstrates the attachment by Digital Natives to a face-to-face relationship regarding potential health issues (Wu & Chen, 2005) but also the importance of consulting their family physician sometimes following them since birth. With the teleconsultation concept, the physician is not the same and thus the creation of an affective and trusted link is impossible.

Finally, the huge impact of Privacy concern on perceived risk (H3) was validated and findings are consistent with previous studies (Van Slyke et al., 2006). With regards to the potential moderator effect of gender, no moderating impact have been highlighted except for the relationship between Self-Efficacy and Intention to use. Indeed, the impact is direct, positive and significant for women and not for men. Finding contradicts previous research confirming that men generally have a higher Self-Efficacy perception (Cassidy & Eachus, 2002). This research also has some managerial implications. First, the e-healthcare professionals (companies, practitioners, health authorities...) should remove the potential adoption barriers with regards to the results-expectation gap (Pavlou, 2003) by providing the targeted population with a clear and convincing communication on all benefits provided by TC solution but also by emphasising the professionalism of remote doctors. They shouldn't neglect or ignore the attachment link between Digital Native and their physicians and work on a way to make this relation more personal or friendly where face-to-face (Wu & Chen, 2005) and physical contact (Bhatnagar & Ghose, 2004, Featherman & Pavlou, 2003) are key. In addition, for the acceptance of such technology, the good buzz is crucial, thus all issues raised should be solved quickly by providing users with an efficient technical support especially in case of new way of service consumption (Belkhamza & Wafa, 2014). To conclude, healthcare professionals should capitalize on the growing interest of e-health services by promoting the solution, by removing risks related to the quality of service. However, this study suffers from some limitations mainly related to the sample that can be regarded as opportunities for future researches. First, targeted respondents were all students from French Business Schools. Findings could be different if the sample was issued from other schools such as Engineering schools, university... In addition, this model should be tested on other Digital Natives population already working and on Digital Immigrants (Born before 1981). Indeed, a comparison between both populations should be interesting. Moreover, this technology is not yet installed everywhere, thus we are only measuring the Intention to Use. Results should be different when analysing the real use of TC. Finally, this analysis could also be managed in medical desert area where the lack of physician is important.

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