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Using Privacy Calculus Theory To Assess Users' Acceptance Of Video Conferencing Apps During The Covid-19 Pandemic

João Miguel de Vasconcelos Gomes

Dissertation presented as partial requirement for obtaining the master's degree in Information Management, with a specialization in Information Systems and Technologies Management

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USING PRIVACY CALCULUS THEORY TO ASSESS USERS' ACCEPTANCE OF VIDEO CONFERENCING APPS DURING THE COVID-19 PANDEMIC

by

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ABSTRACT

Videoconferencing (VC) applications (apps) are getting notable attention worldwide, from common citizens to professionals as an alternative to *vis-à-vis* communication specifically during COVID-19. The growth of VC apps is expected to rise even more in the future with the prediction that widespread adoption of remote work will continue to hold even after the pandemic. This research investigates the key drivers for individuals' intentions into continuing to use this technology in professional settings. Considering the importance of professionals' perceptions of privacy in professionals' settings, this study proposes a conceptual model rooted in the theoretical foundations of privacy calculus theory, extended with the conceptualization of privacy concerns for mobile users (MUIPC), ubiquity, and theoretical underpinnings from social presence theory. The conceptual research model was empirically tested by using data collected from a survey of 487 actual users of video-conferencing apps across Europe. Structural equation modeling (SEM) is performed to test the model. The study revealed several findings (1) perceived value in using VC apps motivates the professionals to continue using VC apps and shapes their perception as they evaluate the risk-benefit trade-off they are making when using VC apps. (2) professionals' indeed form and articulate their own assessment of value based on the perceived risks and benefits associated with using VC apps. However, professionals' perceptions of value are strongly influenced by potential benefits received from using VC apps than by potential risks associated with using VC apps. (3) professionals' perceived risk is determined by MUIPC and trust. (4) professionals' perceived benefits are shaped by ubiquity and social presence. For researchers, this study highlights the usefulness of integrating privacy calculus theory, social presence theory and trust in studying the individuals' behavioral intentions towards new technologies. For practitioners, understanding the key determinants is pivotal to design and build mobile video-conferencing apps that achieve higher consumer acceptance and higher rates of continued usage of VC apps in professional settings.

KEYWORDS

Pandemic; Videoconferencing; Applications; Privacy Calculus; Users; Continuance intentions

PUBLICATIONS

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INDEX

LIST OF ABBREVIATIONS AND ACRONYMS

APPS	Applications
IP	Internet Protocol
MUIPC	Mobile Users' Information Privacy Concerns
SEM	Structural Equation Modeling
SMS	Short Message Service
PLS	Partial Least Squares
VC	Videoconferencing

1. INTRODUCTION

The COVID-19 pandemic, with its travel restrictions, social isolation, and stay-at-home measures, has had a significant impact on how people interact and work and study (Kagan, Alpert, and Fire 2020), practice healthcare (Hakim et al. 2020), direct business (Kumar and Kulkarni 2020) and research (Dickson Adom & Mavis Osei, 2020), and discuss new policies and agendas to ensure citizen's safety and welfare.

Driven by the consideration of social distancing and need to work remotely (Billingsley 2020), VC applications (apps) emerged as the most popular solutions, resulting in unprecedented growth in number of VC apps users and virtual meetings (Kagan et al. 2020). The individuals in healthcare, education, business, government and other sectors have embraced VC apps at substantive rate professionally to cope with the COVID-19 pandemic crisis (Reuters 2020). For instance: to prevent direct contact with each other and replace the face to face meeting with the virtual meetings, the pathologists are using VC apps to share and discuss diagnostically challenging cases remotely; the surgeons, clinicians and diagnosticians are using VC apps to broadcast patient charts and diagnostic imaging and openly discuss management plans (Madrigal 2020); the teachers and professors are using VC apps to conduct their classes remotely (Li et al. 2020); the researchers are conducting their research remotely (Dickson Adom, Mavis Osei 2020); and the government officials are using VC apps to hold virtual meetings (Pontz 2020).

While VC applications make it easier to interact and work with colleagues, they also open the door to serious privacy crimes, which can range from the theft of personal and financial information to the loss of intellectual property, productivity, and reputation (Ahmad 2020). For instance: Microsoft' employees working in China were able to access Skype recordings via a Web app from their personal computers (Mihalcik 2020). Zoom was accused of sending analytics data to Facebook without informing the users, routing meetings' encryption keys through Chinese servers, and making misleading claims about its end-to-end-encryption (Brewster 2020). The lack of enhanced security mechanisms in Zoom lead the uninvited attendees to join the meetings, thus putting users' personal information at risk (Kagan et al., 2020; Billingsley, 2020). These violations make the users' fear that their personal information may be at risk (Neustaedter et al. 2018) as it may be shared with third parties without users' consent (Aiken 2020). Despite the privacy risks and concerns associated with the use of VC apps, VC apps are surging in popularity as individuals' use of VC apps for communication and collaborating with peers for professional purposes has increased (Aiken 2020). To put this in context, as of December 2019, the average number of daily meetings conducted on Zoom were approximately 10 million. As of March 2020, the number of daily Zoom users increased to 200 million and the daily MS Teams users escalated to 1.56 million (Reuters 2020). Despite the Zoom's susceptibility to privacy violations, at the end of March, 2020, American government's three Key COVID-19 response organizations: Center of Disease Control and Prevention (CDC), the Federal Emergency Management Agency (FEMA), and the National Institutes of Health(NIH) spent nearly 1.3 million USD on video-conferencing technology from Zoom for video conferencing, web conferencing and webinars screen sharing (Brewster 2020).

This kind of behavior is commonly known as a *privacy paradox*, where contrary to their concerns about privacy infringements, individuals' are still willing to disclose their personal information to online retailers, as long as they have something in return (Kokolakis 2017). Specifically, individuals' engage in risk-benefit evaluations referred to as *privacy calculus* - of information disclosure (Dinev and Hart 2006). The outcome of such evaluation is *perceived value*, which, when positive, will favor adoption, when negative, will result in rejection (Xu et al., 2011; Morosan & DeFranco, 2015; Shaw & Sergueeva, 2019; Wiegard and Breitner 2019). In this study it is argued that individuals' make trade-off decisions to determine if the risks of privacy violations are worth the benefits of using VC apps for professional purposes including social presence (Brown et al., 2010; Oregon et al., 2018), immediacy (Brown et al. 2010), time savings, spatial flexibility (Li et al. 2020), convenience and cost effectiveness (Archibald et al. 2019).

While there has been a lot of research done on video-conferencing applications, it is still unclear what motivates professionals to continue using them on an individual level despite the privacy risks. Previous studies that looked at videoconferencing as a part of collaborative or social media technology (Brown et al., 2010; Gruzd et al., 2012; L. Li et al., 2015; Liu & Alexander, 2017; Maican et al., 2019; Padilla-Meléndez et al., 2008; Pillet & Carillo, 2016; Sarwar et al., 2019; Silic et al., 2017) do not consider the influence of privacy risks and concerns on professionals' decision to continue using VC apps at individual level, thus making a crucial gap in the literature.

With society being pushed towards a new virtual world during pandemic (Kagan et al. 2020) and the prediction that that widespread adoption of remote work will continue to hold even after pandemic (Russell and Frachtenberg 2020), understanding what drives professionals' intentions to continue using VC apps at individual level becomes crucial for the success of VC apps. Hence, examining what drives professionals to continue using VC apps and why they risk their privacy in exchange for potential benefits, could lead to achieving a better understanding of professionals' behavior towards VC apps in today' new virtual environment, with the implications for the development of privacy sensitive mobile VC apps.

Moreover, the main objective of this study is to investigate and understand professionals' willingness to continue using VC apps at individual level to collaborate with their peers despite the privacy risks associated with VC apps usage. To this end, this study developed a conceptual model rooted in the theoretical foundations of privacy calculus theory (Culnan & Armstrong, 1999; Dinev & Hart, 2006), extended with conceptualization of privacy concerns for mobile users i.e., mobile users' information privacy concerns – MUIPC (Anwar, Mohamed Shuhidan, and Zaini 2020), ubiquity (Okazaki and Mendez 2013), as well as theoretical foundations from social presence theory (Short, Williams, and Christie 1976) that can capture the unique nature of VC apps.

In addition, in this dissertation it is argued that given the professionals' limited time, any technical difficulties encountered before or during the session using VC apps may significantly lower the influence of perceived value on continuance intentions to use. On the other hand, if the VC apps have provided excellent services in terms of ease of use, connectivity, call quality, and lower interruptions, then the influence of perceived value on continuance intentions may increase. Hence, in this study it is investigated the moderation effect of technicality on the relationship between perceived value and continuance intentions.

This research provides three significant contributions. First, the research increments the understanding of what drives individual attitudes and behaviors regarding using VC apps in the workplace. It demonstrates how the dual path privacy calculus model may be used to examine new and emerging technologies that are remodeling work environments. Second, the study increments previous research in areas such privacy calculus, MUIPC, ubiquity, and social presence which are essential to online collaborative tools. Third, this study is able to evaluate the social richness and technological capabilities of VC apps in the context of information privacy concerns and recognized advantages. As a result of this study, knowledge is incremented regarding how professionals interact with VC apps. The research findings enable a better understanding on how a privacy-conscious VC apps development better fulfills modern age working users. Furthermore, this research is not only timely as the COVID-19 pandemic is far from extinguished but of its essence, since VC apps utilization is rising and with a high chance of prevailing as common professional collaboration tools.

The dissertation is structured in the following way. Section 2 provides an overview of video-conferencing applications, prior research on VC apps, and the theoretical foundations of this research. The conceptual model and the related hypotheses are presented in section 3. Section 4 states the research methodology and design, followed by the analysis of results. In section 6, the major findings of the study are discussed, its theoretical contributions, and managerial implications. Lastly, this study is concluded with the discussion of the limitation of the study and suggesting paths for the future research.

2. LITERATURE REVIEW

2.1. VIDEOCONFERENCING APPLICATIONS (VC APPS)

Video conferencing is an interactive tool that facilitates communication and collaboration between two or more individuals in real time through a combination of high-quality audio and video over internet protocol (IP) network (Billingsley 2020). The advent of Videoconferencing can be traced back to 1963, when the initial commercial, analogue video-conferencing system became available (Reynolds, Eaton, and Mason 2008). After its first launch, it took almost twenty years to develop a very first digital version of video-conferencing systems (Reynolds et al. 2008), that yielded a higher quality and transmission as compared to analogue systems (Dudding 2009). However, the system at the times suffered from being complex and expensive (Reynolds et al. 2008).

With the expansion of internet and availability of faster, more reliable telecommunications networks, the digital version of video-conferencing systems transformed into an integrated, easy to use, and reliable desktop and web-based videoconferencing systems (Reynolds et al., 2008; CC, 2009). Although, at those times, the web-based systems such as Skype were free to use globally, they still required extensive bandwidth (Reynolds et al. 2008) and were restricted for use in fixed boardrooms.

Later, the advent of affordable broadband technology, enhanced micro-processor capabilities and inbuilt cameras in the mobile computing platforms extended the capabilities of video-conferencing systems beyond the fixed meeting rooms use to anytime and anywhere, thereby transforming the traditional VC systems into ubiquitous mobile video-conferencing applications (VC apps) (Zhang et al. 2016). Mobile VC apps enabled the interactions between different individuals from any location, even while in transit, using data capable mobile devices including smart phones, tablets, and laptops with cellular or Wi-fi access (Zhang et al. 2016). With time, various video-conferencing applications came into existence (e.g., Skype, Zoom, Google Hangouts Meet, Zoho Meeting, Eyeson, Cisco Webex, GoToMeeting etc), providing the individuals a variety of choices to choose from (Gray et al. 2020). These VC apps incorporate a variety of sophisticated features including screen sharing, recording, chat, document sharing, polling, whiteboard, breakout rooms etc, and with that facilitating greater engagement and interactivity. As a communication technology, characterized by ubiquity (Zhang et al. 2016) and social presence (Short et al. 1976; Brown et al., 2010), VC apps allow distinctive value to individuals' by enabling convenience in terms of access to geographical remote participants, ease of use, cost savings (Archibald et al. 2019), time savings and spatial flexibility (Li et al. 2020).

When travel restrictions, social distancing, and shelter in places were dictated by the need to slow down the spread of virus (Billingsley 2020), the distinctive features of VC apps made them more valuable during current COVID-19 pandemic. During pandemic, VC apps aid providers providing timely diagnosis and treatments to their patients (Hakim et al. 2020), teachers to continue support students in their learning (Madrigal 2020), researchers to continue their research (Dickson Adom, Mavis Osei 2020), businesses to continue their operations and meet the contractual commitments with their coveted customers (Kumar and Kulkarni 2020), and political parties to conduct cabinet meetings.

VC apps are not always secure as they suffer from security and privacy violations that may range from unencrypted communications for unpaid users to vulnerabilities that enable malware execution on participants devices (Kagan et al. 2020). For instance, the known incidents of Zoom raised privacy concerns as uninvited attendees were able to join the Zoom meeting by simply guessing meeting IDs and disrupt the meetings (Billingsley 2020). These violations may lead intruders to gain access to participants sensitive data including their names, usernames, face images, voice samples, and even exposure to sensitive data that were shared as part of the conversation (Kagan et al. 2020).

As society is pushed towards a new virtual world (Kagan et al. 2020) and it has been predicted that widespread adoption of remote work will continue to hold even after pandemic (Russell and Frachtenberg 2020), understanding what drives professionals' intentions to continue using VC apps at individual level becomes crucial for the success of VC apps.

2.2. PRIOR RESEARCH ON VIDEOCONFERENCING

Prior literature has considered videoconferencing as a part of collaborative technologies (Brown et al. 2010) or a social media technology (Gruzd et al., 2012; Sarwar et al., 2019). Having said that, videoconferencing as a part of collaborative technologies or social media technologies has been extensively studied in prior empirical literature to understand their role in knowledge sharing (Pillet and Carillo 2016), enhancement of collaborative learning (Sarwar et al. 2019), collaboration (Li et al. 2015), research practices (Gruzd et al. 2012), collaborative learning and learner performance (Sarwar et al. 2019), use (Liu and Alexander 2017) or intentions to use (Brown et al., 2010; Maican et al., 2019; Padilla-Meléndez et al., 2008; Silic et al., 2017).

Popular theories and models, such as technology acceptance model (Davis 1989), unified theory of acceptance and usage of technology (UTAUT) (Venkatesh et al. 2003), task technology fit (TTF) (Goodhue and Thompson 1995) has been used as a theoretical foundation to study individuals post adoptive behavior with regards to collaborative technologies/social media technologies. In seeking better understanding of VC as a part of collaborative/social media technologies adoption determinants or its role in enhancing academic performance, studies have also progressed beyond these theories and models. For instance: Brown et al., 2010, used UTUAT2 in conjunction with social presence theory (Short et al. 1976), task closure model (Straub and Karahanna 1998), channel expansion theory (Carlson and Zmud 1999) to predict individuals intentions to use collaborative technologies including SMS and in house developed systems that provided features to chat, audio-conference, video-conference, shared whiteboard, save meeting notes and use some functionalities of other organizational applications. Sarwar et al. 2019, considered VC apps such as WeChat and WhatsApp as a part of social media technologies along with Facebook and LinkedIn and integrated TAM with Constructivism Theory (Bruner 1966) investigated their influence on collaborative learning and learning performance of students. So far, none of the studies have exclusively studied the adoption or intentions to use VC apps specifically the consumer graded or off the shelf VC apps. In addition, the studies that empirically studied VC apps as either a part of collaborative technologies or social media technologies did not investigate the influence of privacy concerns on individuals' adoption or intentions to use VC apps. Given that these VC apps are susceptible to privacy violations and it has been predicted that the widespread adoption of remote work will continue to hold even after pandemic (Russell and Frachtenberg 2020), it is very crucial to understand what drives individuals to continue using VC apps professionally despite the privacy risks associated with its use. By investigating this trade-off, the study can help us better understand individuals' behavior towards VC apps for professionals' purposes in today' virtual environment, with the implications for the development of privacy sensitive mobile VC apps. A summary of the studies exploring VC apps as a part of either collaborative technologies or social media technologies including the theoretical models used, independent and dependent variables, methodology and data and context has been presented in Table 1 of the Appendix.

2.3. ADOPTION MODEL - PRIVACY CALCULUS THEORY

The concept of calculus was introduced by Laufer & Wolfe (1977), where authors argued that an individual's decision to disclose personal information depends on three critical aspects of calculus of behavior: *institutional norms of appropriate behavior* i.e., an individuals may disclose personal information based on "institution's definition of appropriate behavior" Laufer & Wolfe, 1977, p.36; *expected benefits* i.e., an individual may disclose personal information in exchange of anticipated benefits by using protective modes of responding; *unpredictable consequences* i.e., individuals may choose not to do certain things due to unpredictable consequences (Laufer & Wolfe, 1977).

Later, Culnan & Armstrong (1999) argued that an individual decision to disclose personal information while making transactions with the retailers involves privacy calculus i.e., individuals are willing to disclose their personal information in exchange of social and economic benefits, provided their personal information will be used fairly. The individuals are willing to disclose their personal information to the retailers when they are explicitly informed that retailers have deployed fair information practices to protect their information privacy and their privacy concerns are addressed by fair procedures (Culnan and Armstrong 1999).

Dinev and Hart (2006), extended the privacy calculus model in the context of e-commerce. In this model the authors argue that a set of beliefs that influences individual's decision to disclose personal information, which is necessary to successfully complete transactions on the internet, can be contrary, and these beliefs may act simultaneously to influence the decision process, in which the user is engaged. The influence of one belief may outweigh the other to the extent that the resulting stronger belief influences an individual's behavioral intentions such as disclosure of the personal information (Dinev and Hart 2006).

Next, Wilson and Valacich (2012) extended privacy calculus by adding situational factors arguing that within privacy calculus, economic and social benefits, personalization or convenience benefits tend to override the perceived risks (Wilson and Valacich 2012). In utilizing privacy calculus, Dinev and Hart (2006) and Wilson and Valacich (2012) both used perceived risks and benefits as an independent construct.

Later, Kehr et al. (2015) extended the privacy calculus model by proposing situational privacy calculus, where the authors argue that "situation specific assessment of risks and benefits is bounded by (1) pre-existing attitudes or dispositions, such as general privacy concerns or general institutional trust, and (2) limited cognitive resources and heuristic thinking" (Kehr et al., 2015, p.607). The authors argue that an individual's intention to disclose personal information results from the conjoint assessment of perceived risks and benefits i.e., perceived risks and benefits are not independent, rather interdependent (Kehr et al. 2015).

To date, the theoretical framework of privacy calculus has been applied as theoretical foundation to explain individual's self-disclosure behaviors in various contexts including location-based services in mobile devices (Xu et al. 2009), location aware marketing in mobile devices (Xu et al. 2011), e-commerce (Li, Sarathy, and Xu 2011), social networking systems (SNSs) (Krasnova, Veltri, and Günther 2012), location based social network services (Zhao, Lu, and Gupta 2012), mobile applications (Keith et al., 2016; Wang et al., 2016), hotel apps (Morosan and DeFranco 2015); adoption behaviors in the context of healthcare wearable devices (Li et al. 2016), personalized nutrition services (Berezowska et al. 2015), and mobile applications (Pentina et al. 2016); loyalty intentions in the context of mobile hotel booking loyalty (Ozturk et al. 2017), and Pay-As-You-Live (PAYL) services (Wiegard and Breitner 2019).

Individual's perceptions of risk of information disclosure are embedded in their concerns. Technology adoption and personal information disclosure introduces considerable uncertainties about who has the access to the information and how it is used (Dinev and Hart 2006). these risks assessments are balanced by individuals' perceptions of trust in organizations (Malhotra, Kim, and Agarwal 2004) as well as anticipation of benefits of

information disclosure/adoption or continuance usage of a technology such as personalization (Xu et al. 2011), functional congruence and perceived informativeness (Li et al. 2016), perceived enjoyment, ease of use (Wiegard and Breitner 2019), perceived usefulness (Shaw and Sergueeva, 2019; Wiegard and Breitner, 2019) etc. which motivates the users to disclose personal information/ adopt or continue using technology. When engaging in privacy calculus, consumers do not treat privacy as an absolute societal value, but rather as a commodity characterized by economic value (Jeff Smith, Dinev, and Xu 2011). The outcomes of such evaluations are perceptions of value associated to information disclosure (Xu et al., 2011; Morosan and DeFranco, 2015) or intentions to use a technology (Xu et al., 2011; Shaw and Sergueeva, 2019; Wiegard and Breitner, 2019).

This study argues that the use of VC apps for the professional purposes often demands the professionals to be continuously engaged in a dynamic adjustment process. With this said, potential privacy risks are weighed against the rewards of using VC apps and ultimately disclose their personal information to the VC apps service providers, elevating the privacy calculus as very significant and highly relevant in VC apps context.

2.4. ADOPTION MODEL - MOBILE USERS' INFORMATION PRIVACY CONCERNS

Privacy concerns are the "concerns about opportunistic behavior related to the personal information submitted over the Internet by the respondent in particular" (Dinev and Hart 2006). Most of the research in privacy concerns have investigated two key conceptualization of privacy concerns: Concerns for Information Privacy (CFIP) proposed by (Smith, Milberg, and Burke 1996) and the Internet User's Information Privacy Concerns (IUIPC) proposed by Malhotra et al. (2004). CFIP was developed to measure individual's concerns about organizational information privacy practices, whereas IUIPC was proposed to measure internet user's information privacy concerns. Building on these privacy related constructs and drawing on communication privacy management theory, Xu et al. (2012) proposed a new instrument of privacy concerns known as Mobile Users' Information Privacy Concerns (MUIPC) that measures users' privacy concerns in the context of mobile environment.

In their review of privacy literature, Bélanger & Crossler, (2011) suggest that when selecting an instrument for privacy concerns, the researchers must provide a clear explanation about why the selected instrument is appropriate for the study (Bélanger and Crossler 2011). It is also very crucial to conceptualize privacy concerns in the context in which it is studied (Hong and Thong 2013).

In this research it was choose MUIPC as the instrument of the study because since the main interests are mobile based VC apps and the focus remains within the users (professionals in this case) in the mobile environment. Due to aggressive practices of data collection and sharing employed by applications running on mobile devices, the privacy concerns of mobile users are likely to be different from online users (Anwar et al. 2020). Enhanced capabilities of mobile devices such as use of sensors, cameras, microphone, GPS, have improved the capabilities of mobile applications running on mobile devices to profile and target specific individuals. The mobile apps can capture extremely sensitive and private information about users including their photos, videos, daily conversations, visited locations etc. With such powerful sensing capability rising, privacy concerns are elevated significantly (Mirzamohammadi and Sani 2016). To this end, MUIPC is considered a more suitable and valid instrument to address privacy concerns users in the mobile environment (Degirmenci 2020).

MUIPC consists of three dimensions: perceived surveillance, perceived intrusion, and secondary use of personal information. Perceived surveillance represents mobile users concern regarding their personal information including activities getting watched, listened to, or recorded by mobile apps service providers. Surveillance of mobile users has drastically increased over the past years due rapid advancements in mobile technologies and its

various functionalities such as emails, web- browsers, photos, calendars, contact lists etc. (Anwar et al. 2020). Through these functionalities, vendors and/or service providers are able to collect information about users' identities, schedules, real time location, time spent on different applications, contact lists etc. (Anwar et al. 2020). Perceived intrusion relates to mobile users concern regarding mobile apps possessing or soliciting users personal information and thereby interrupting their daily activities through the unwanted presence, creating discomfort and harm (Anwar et al. 2020). Malware is an increasing concern for mobile devices and malware developers can access excessive amounts of data including keyword stroke cache, usage pattern of apps, and browser history etc. (Anwar et al. 2020). Secondary use of personal information relates to mobile users' concern over the vendors using their personal information for secondary purposes or revealing it to unauthorized entities without their consent or awareness (Anwar et al. 2020).

Regardless of the context in which privacy concerns have been examined, prior privacy literature has considered privacy concerns as a predictor of both perceived privacy risks and trust (Malhotra et al., 2004; Slyke et al., 2006; Kehr et al., 2015; Wu et al., 2015).

2.5. ADOPTION MODEL - SOCIAL PRESENCE

The concept of social presence was introduced in the seminal work by Short et al. (1976). Parker et al. (1978) note that social presence is a significant factor in understanding an individual to individual communications. Short et al. 1976 define social presence as the "the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships..." (p. 65). Moreover, social presence represents the extent to which an individual perceives another individual in the technology mediated communication as the real person. Short et al. (1976) hypothesis that social presence is the quality of medium and different communications media differ in their degree of social presence. The factors such as: the capacity to transmit information about facial expression, posture, direction of looking, dress, and non-verbal cues, all contribute towards social presence of a communication medium, therefore making face to face communications highest in social presence, followed by video communications, audio, and written memos (Short et al. 1976).

Short et al.(1976) note that users of any given communications medium are in some sense familiar with the degree of social presence of the medium and prefer to avoid utilizing the medium for specific types of interactions; specifically, the interactions that demand a higher degree of social presence than they perceive the medium to have. The authors conceive social presence as a medium of perceptual or attitudinal dimension of the individual utilizing the medium and it is the individuals who determine how the factors listed above contribute towards social presence of a communication medium (Short et al. 1976). The individuals provide self-report measures of the subjective quality of the communication medium and judge it as being unsociable-sociable, insensitive-sensitive, cold-warm and impersonal -personal (Short et al. 1976).

In their review of studies measuring social presence Biocca et al. (2003) highlighted that due to lack of consensus (different definitions of social presence) on the conceptualization of social presence, different measures of social presence exist. Biocca et al. (2003) identified four key themes in which researchers measured social presence: perceived social richness of the medium, involvement, immediacy or intimacy, social judgement of others, and single or two item measures. Biocca et al. (2003) noted that out of the above four themes, perceived social richness of the medium was the most widely used measure as the term "social presence" was popularized by Short et al. (1976). In perceived social richness of the medium approach, the users of communication medium use a "self-report measure of the subjective quality of the communication medium" (Short et al., 1976, p. 65) and judge it as being unsociable-sociable, insensitive-sensitive, cold-warm and impersonal -personal. In this measure, the

users are not asked to assess their experience of others, rather indirectly assess the effect of the medium i.e., the social and emotional capabilities of the medium (Biocca et al., 2003). The involvement, immediacy, or intimacy approach is used to assess the specific interactions or the other's general communication capabilities in interpersonal communications i.e., whether the other person is perceived to be interested, involved or emotional in the conversation. In this approach, users judge the statements of their communication partner using semantic differentials or Likert scale. Social judgement of others approach measures the sense of feeling similar to the other in attitude, behaviors or emotions such as the user's perceptions of avatars and agents in a virtual environment (Biocca et al., 2003).

Users are motivated to utilize media to modulate social presence for diverse activities including problem solving and making decisions, exchanging opinions, resolving conflicts, getting to know someone, or maintaining family relations. Various technologies are progressively designed, engineered and manufactured to increase social presence and are referred to as social presence technologies (Biocca et al., 2003).

While reviewing the literature, it was found that some studies have adopted perceived social richness of medium (Y. Yun and Sung, 2010; Ogara et al., 2014; Han et al., 2015; Choi, 2016), while others have adopted intimacy, immediacy, involvement approach (Song and Hollenbeck, 2015) or Social judgement of others (Kirillova and Wang, 2016).

In this study it is used perceived social richness of the medium as the measure of social presence since the focus is to assess how professionals assess the social and emotional capabilities of VC apps. Furthermore, it is studied how professional's perceptions of social presence in VC apps influences their awareness of VC apps being beneficial. Brown et al. (2010) suggest that since a communication medium acts as an interface between people, the higher the social presence it exhibits, the more useful the communication medium is often seen (Brown et al. 2010).

2.6. ADOPTION MODEL – UBIQUITY

Ubiquity is one of the most important characteristics of mobile devices and services. The concept of ubiquity was introduced back in 2002, where it was discussed in the context of U-commerce (Watson et al. 2002), wireless advertising (Barnes 2002), and mobile commerce (Balasubramanian, Peterson, and Jarvenpaa 2002). Since then, ubiquity has been conceptualized in a variety of ways.

Based on prior information systems literature and extending the work of Watson et al. (2002), Junglas Watson (2006) proposed ubiquity as one of the four u-commerce constructs comprising reachability, accessibility and portability. Junglas and Watson (2006) defined ubiquity as "the drive to have access to information unconstrained by time and space" (Junglas and Watson 2006). The authors (Junglas and Watson 2006) note that in the ubiquitous world, individuals are capable of accessing the network at any time (reachability and accessibility) from anywhere (portability) and in turn can be reachable at anytime and anywhere. That means that the information systems are not restricted in their usage to one dedicated place anymore, instead they can be accessed everywhere. S. Kim & Garrison (2009) conceptualized ubiquity as "individual's perception regarding the extent to which MWT (mobile wireless technology) provides personalized and uninterrupted connection and communications between the individual and other individuals and/or networks" (S. Kim and Garrison, 2009, p. 326). According to S. Kim and Garrison (2009), the ability to communicate and collaborate at anytime and anywhere through wireless communication technology provides users' the freedom in time and space offering them extraordinary levels of flexibility and convenience (Kim and Garrison 2009).

Based on their literature review on studies in the fields of management, marketing, business and information sciences, Okazaki et al. (2012) identified that the most commonly accepted definition of ubiquity is "the

interconnectedness dimension of time savings and spatial flexibility" (Okazaki et al. 2012). The concept of time savings represents the mental calculation that a user performs of the time saved when performing activities using a mobile service. Spatial flexibility represents the perceived mobility that a mobile service provides to a user to perform the activities without having to be restricted at one place (Okazaki et al. 2012).

Okazaki and Mendez (2013) proposed, developed, and tested a formal measurement instrument for perceived ubiquity for mobile services. Perceived ubiquity was proposed as a second order construct with first-order four factors including continuity, immediacy, portability, and searchability (Okazaki and Mendez 2013). Continuity relates to the state or aspect of being continuous i.e., the unique ability of mobile technology to provide continuous access to services that cannot be offered by traditional channels. Immediacy relates to one's perceived amount of time between an action and its resulting outcomes i.e., quickness of an action or occurrence. Portability represents the quality of being light enough to be carried anywhere. Searchability covers information or data search in computer mediated environments and refers to the capability to make thorough examinations (Okazaki and Mendez 2013).

The literature review shows that most of the studies have either accepted the notion of ubiquity in the context of mobile devices as combination of anywhere and anytime nature (S. Kim and Garrison, 2009; H. Yun et al., 2011; Tojib and Tsarenko, 2012; Zhou, 2012; Choi, 2016), the combination of flexibility of time and space (Okazaki et al., 2009; Okazaki et al., 2012), or the four first-order constructs of second order Ubiquity (Roy and Moorthi 2017).

Despite adopting different notions of ubiquity, almost all the studies have agreed that ubiquity is one of the most significant characteristics of mobile services and one of the meaningful attributes when studying and assessing mobile services. In this study it is measured ubiquity through six dimensions specified in the prior literature: time savings, spatial flexibility, continuity, immediacy, and portability. Since videoconferencing is not used to search data and information, searchability it is not included in this research.

3. CONCEPTUAL MODEL AND HYPOTHESES

The proposed model is based on the previously mentioned studies that combine MUIPC (Belanger and Crossler 2019) with ubiquity (Okazaki et al., 2012; Okazaki and Mendez, 2013), social presence (Short et al. 1976) combined with privacy calculus theory (Culnan and Armstrong, 1999; Dinev and Hart, 2006) in order to unfold the impact on user's continuance intentions regarding using video conferencing apps. In the model below there are two double-bordered constructs, as they are of the second order. MUIPC is a second order construct of perceived surveillance, perceived intrusion and secondary use of personal information. Ubiquity is a second order construct of time savings, special flexibility, portability, immediacy and continuity.

The two previously mentioned constructs alongside trust and social presence are directly influencing the privacy calculus domain, which consists of perceived risks and perceived benefits together with its combined output - perceived value. Technicality has been considered as a moderator effect with regards to continuance intentions. Moreover, this study towards user's continuance intentions of using video conferencing apps consolidates the mentioned theories within these nine constructs, as that time is at its essence to address this topic during this pandemic time. The proposed model is presented in Figure 1.

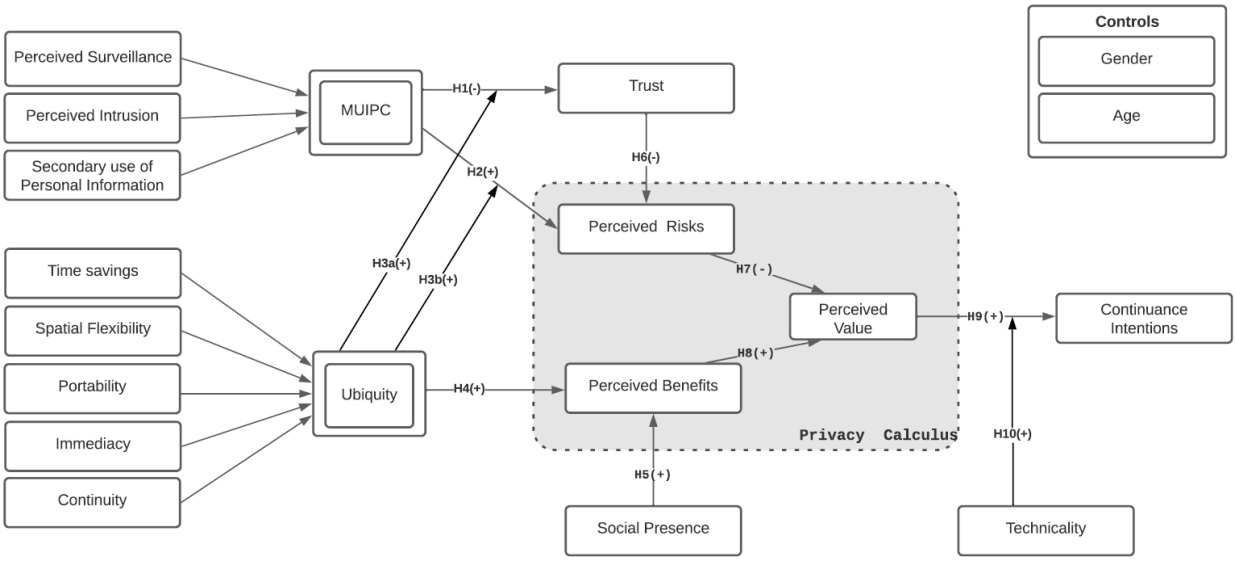


Figure 1. Conceptual research model

3.1. THE ROLE OF INFORMATION PRIVACY CONCERNS

Information privacy has traditionally been described as the individual's right to control the conditions in which personal information is collected and used (Clark and Westin 1968). Moreover, it is one of the most researched constructs in the privacy literature (Bélanger and Crossler 2011). Three main concepts arose throughout time: the CFIP (Concern for Information Privacy) (Smith et al., 1996; Stewart and Segars, 2002), the Internet Users Information Privacy Concerns (IUIPC) (Malhotra et al. 2004) and the adaptation of CFIP by Xu et al., 2012 for the mobile scope, which is used in this research. According to Xu et al., 2012, MUIPC relies

in three dimensions: perceived surveillance, perceived intrusion and secondary use of information. When referring to surveillance, it consists in "the watching, listening to, or recording of an individual's activities (Solove, 2006, p.490)". Perceived surveillance refers to the foundations of privacy concerns of individuals that are derived from the amount of personal information requested by others (Malhotra et al. 2004), which triggers the individual sensibility with regards to how much others should know about private information (Petronio 2010). Furthermore, today's fast-growing enhanced technology usage has created a vast amount of personally invasive data that was not been collected before, e.g., identity, list of contacts, location, calendar appointments, etc. (Anwar et al. 2020). Intrusion as a concept has commonly been related to the personal space concept (Solove 2006). In fact, Solove, 2006, describes intrusion as the action that infers disturbance in one's solitude or tranquility, while Xu et al., 2012, elaborate on the concept by mentioning the amount of reachable data that nowadays exists, which might provoke user's resistance while using mobile apps since the fear for malware or misconduct generate discomfort and distrust. As for secondary use of personal information, it consists in using individual's collected data with a specific purpose in a non-previously authorized one (Smith et al. 1996), and following Jin, 2012, it triggers the established relation of the mutual privacy agreement of one's restricted access with confined information.

Since the rhythm of information being shared increases day by day, McKnight et al. (2002), state that users are more prone to disclose their own information when there is a perception that the recipient it trustworthy. Thus, trust is identified as a key determinant of online technology usage (Bélanger and Carter, 2008; Belanger et al., 2002), also, Okazaki et al. (2012), predict that the internet users' information privacy concerns have a negative effect on trust. Literature has also shown that the concepts of trust and risk are highly relevant in the context of information privacy (Malhotra et al. 2004). Mobile user's information privacy concerns reflect the worries that mobile users have about the opportunistic behavior of mobile apps service providers related to information collection, use, and handling. The highly interactive nature of VC apps not only provide indisputable advantages (Venkatesh et al. 2009), but also make individuals worry about them being under surveillance while using VC apps (Yuan et al. 2016). The flaws in the implementation or even deliberate backdoors in the system can allow others (Clarke 2017) to monitor or record user's activities through VC apps. Communications using VC apps can result in privacy invasions as it reveals too much information about the user's appearances, place or behavioral context (O'Hara et al., 2009; Neustaedter et al., 2015), and conversations. Zoom's collection of user's data and selling it to Facebook without users' explicit consent (Hamilton 2020) make individuals' worry about how about their information will be revealed, shared and misused without their awareness and consent. This worry can be considered as the root cause of perceived risks for the VC apps users, similar to the concerns described in prior studies about internet and online users, which impacts trust and perceived risks (Malhotra et al., 2004; Bansal et al., 2016). Individual's worries about the opportunistic behavior of online vendors with regards to information handling can increase individual's risks beliefs and lower their trusting beliefs in online vendors (Malhotra et al., 2004; Bansal et al., 2016) in the similar manner that distrust tends to augment and perpetuate distrust (Bansal et al., 2016).

Consistent with the prior literature and above discussion, it is argued that a higher degree of professional's privacy concerns is more likely to be associated with their lower trust in VC apps service providers and increased perceptions of risks associated with using VC aps. Thus, it is postulated that:

***H1**. Mobile Users' Information Privacy Concerns (MUIPC) have a negative effect on Trust.*

***H2**. Mobile Users' Information Privacy Concerns (MUIPC) have a positive effect on Perceived Risks.*

3.2. THE ROLE OF UBIQUITY

Studies regarding the concept of ubiquity have been unanimous when implying it as one of the most important attributes of mobile services (Okazaki and Mendez 2013), since it consist is a key differentiator factor from mobile internet to PC internet (Balasubramanian et al. 2002). Moreover, Okazaki et al. (2012) state that ubiquity means being invisible, seamless, or, according to Watson et al. (2002) omnipresent: "not only that they are everywhere but also that they are, in a sense, nowhere, for they become invisible as we no longer notice them" (p. 332). Furthermore, the freedom, the convenience and the ubiquity that mobile internet generates distinguishes it due to these three main advantages (Anckar and D'Incau 2002). Within ubiquity as a concept, literature has demonstrated that several authors consider different factors to its foundation. Time saving as a term, has been described as the adaptation of one's activities duration in a more efficient way (Feldman and Hornik 1981). Okazaki et al. (2012), state that time saving relies on the user's own calculation regarding the perceived time saved by using a mobile device. Acting closely to the time dimension, space (or spatial flexibility) has been referred as the service's spatial approachability, in the way that the user is enabled to perform services activities in various locations (Heinonen 2006). Jarvenpaa et al. (2003) also identify that the main gains of mobile commerce consumers consist in coordination flexibility, capacity to engage and the spatial independence. In line with the usage of communication technologies, portability as a concept has been highly related to users lives, more specifically to the social aspect due to the effectiveness in information and communication activities it provides (Garfield 2005). According to Okazaki and Mendez (2013), these same characteristics may be associated to information systems since they are crucial to support all forms of mobility due to its smaller size. Portability, as a synonym of mobility, has been associated as a key feature of place and time independence (Mallat et al., 2008; Chatterjee et al., 2009). Correlated with portability, immediacy is often stated when referring to the speed of an action or an occurrence (Okazaki and Mendez, 2013). Immediacy as a term, has often been referred has one of the most important aspects of collaboration technologies (Carlson and Zmud, 1999; Dennis et al., 2008; Fulk, 1993). It is associated to the way a collaboration technology may be used to enable users to communicate with each other (Brown et al. 2010), as well as the amount of time it takes from an action to its respective consequences (Crano 1995). When it comes to continuity, it has been described has the main feature of 3G internet, more specifically, the ability of being always connected (Okazaki & Mendez, 2013). According to Kleijnen et al. (2007), the ability of continuous internet access has been described has a distinguishing factor that elevates mobile internet access from other channels.

Ubiquity represents the degree to which VC apps users believes that video-conferencing apps provide uninterrupted connection and access to their peers anytime and anywhere (Arpaci 2016). When working together, professionals often engage in discussions, negotiations, instant feedback, and decision making. These tasks often require back and forth transmission of small quantities of information, needing the availability of both the parties at the same time (Straub and Karahanna 1998). Individual's chose collaboration technologies based on their ability to reach their partners i.e., whether the collaborating partner is immediately available for communication or not (Straub and Karahanna 1998). Professionals likely need immediate availability of their partners, when engaging in discussion, negotiations, and decision-making tasks. The ability to access VC apps through mobile terminals and networks gives professional's an "always available link" to instantly connect with their peers beyond their spatial differences, thereby making VC apps as more effective and efficient (Brown et al. 2010) for the task stated above. Through VC apps, the communicating professionals can become available at the same time, without physically getting together in one place enabling them to engage in virtual collaborations (Jimenez et al. 2017). This characteristic of spatial flexibility results in time and cost savings, convenience and ease of use (Armfield, Bradford, and Bradford 2015), which in turn positively influences professionals' perceptions of VC apps as being beneficial in

enhancing their performance, efficiency, and effectiveness in completing their work-related tasks. Based on the above discussion, it is assumed that professionals are likely to obtain benefits from seamless connection with their peers via mobile VC apps.

Ubiquity in the context of mobile advertising can also moderate the influence of information privacy concerns on trust and perceived risks (Okazaki et al. 2009). This moderating effect applies in the context of VC apps too. For instance: the continuity characteristic of mobile devices enables the consumers to use these devices as well as the services running on these devices (VC apps in this case), while they are on the move, at anytime and anywhere (Wang et al. 2016). Although this feature of continuity may offer many benefits to VC apps users, it may also provide VC app service providers an ability to collect additional information about professionals related to their location. This additional information collection may increase anxiety in professionals and make them worry about their personal safety and unforeseen abuses of their personal information. Such worries will likely intensify the influence of MUIPC on privacy risks and trust. i.e., the higher the ubiquity, the stronger the effect of MUIPC on perceived risks and trust. Hence, it is also postulated that Ubiquity will increase the influence of MUIPC on the perceived risks and trust. Therefore:

***H3a**. Ubiquity positively moderates the effect of MUIPC on Trust.*

***H3b**. Ubiquity positively moderates the effect of MUIPC on Perceived Risks.*

***H4**. Ubiquity has a positive effect on Perceived Benefits.*

3.3. THE ROLE OF SOCIAL PRESENCE

The supported theory behind social presence states that collaboration technologies (such as videoconferencing apps) are different in the way they diffuse the psychological impression of users physical presence (Short et al. 1976). Brown et al. (2010), argue that collaboration technologies with high social presence transmit a personal and social communication environment. In the same line of thought, Brown et al. (2010) state that social presence is impacted by the technology property of being able to convey nonword and nonverbal communication, like voice or facial expressions. Today's available technology allows this gap between face-to-face communication and computer- based communication to be fulfilled (Choi 2016). Regarding the information technology scope, Animesh et al. (2011) , state that users are keen on embracing the virtual worlds since social presence proactively leads to it.

Social presence represents the degree to which VC app users perceive the communication interactions with their peers over VC apps as sociable, warm, personal and humanizing. Social presence may be dependent upon potential of communication media to convey both non-verbal cues and relational information (Bente et al. 2008). The media that allow for communication of maximum number of audio and visual cues such as gestures or facial expressions would lead to higher degree of social presence (Rogers and Lea 2005). The media that exhibits higher social presence are more suited for the ambiguous and equivocal tasks that require resolution of differences of opinions and views among individuals (Yoo and Alavi 2001). The communication media with both audio and visual cues such as videoconferencing yields higher social presence, thereby yields high quality of the outcomes of equivocal tasks in decision making such as improved group consensus (Yoo and Alavi 2001) and performance and effectiveness (Brown et al. 2010). Mobile VC apps exhibit higher social presence as it emulates face to face interactions by conveying variety of social cues including audio, video, text, file sharing, emoticons etc. An elevated social presence fosters cognitive and affective reactions in the individuals using higher social presence

media. These reactions may range from perceived usefulness, ease of use (Hew et al. 2018) to enhanced performance and usefulness (Brown et al. 2010).

Given that the main reason of using VC apps is to interact with peers, professionals who experience social presence namely warm and personal, humanizing interactions through VC apps are more likely to perceive VC apps as beneficial. Therefore, it is hypothesized:

H5. *Social Presence has a positive effect on Perceived Benefits.*

3.4. THE ROLE OF TRUST

Pavlou and Fygenson (2006), have described trust as the trustor's belief that the trustee will act accordingly without any vulnerability being exploited. Past researches identify trust as one key factor for using online technologies (Belanger et al., 2002; Bélanger and Carter, 2008), or even state that there is an existing connection between trust and the willingness to provide information (Dinev et al., 2006; Malhotra et al., 2004). Trust is particularly important within the information systems realm since security and privacy are at risk (Venkatesh et al. 2011), as well as if trust established, users perceive greater benefit and lower risk in providing personal information (Rohm and Milne, 2004; Shin, 2010). Thus, users' willingness in disclosing personal information is positively related to trust, and trust is negatively related to perceived risk (Kim et al. 2019).

Trust represents the VC app user's confidence in the reliability and trustworthiness in VC app service providers with regards to protecting and handling of user's personal information. Individual's trust in an organization functions differently according to how a specific risk is communicated or managed. The perceptions of risk appear to be a consequence of trust, rather than a determinant of trust, in the sense that if individual's trust an organization to be trustworthy in managing a specific risk, they perceive the risk as smaller and the benefits as higher (Chryssochoidis, Strada, and Krystallis 2009). Like prior literature, this study argues that professional's trust in VC apps service providers depends upon privacy and security properties of the information access and protection model deployed by VC app service providers. If VC apps service providers follow strict security and privacy policies, then professionals trust in VC app service providers may be enhanced, which in turn will lower level of privacy risks associated with use of VC app services. Therefore, it is hypothesized:

H6. *Trust has a negative effect on Perceived Risks.*

3.5. THE ROLE OF PRIVACY CALCULUS

Privacy calculus researches have been mentioned as antecedents of information privacy concerns studies (Kim et al. 2019). Jeff Smith et al. (2011), argue that personal information contains tradable economic value, as well as mention that the analysis of the trade-off between benefits and risks occurs when users are requested to disclose personal information. According to Malhotra et al. (2004) and Dinev et al. (2006), the potential losses when disclosing personal information are the foundations of perceived risk. Moreover, with the increasing importance of private information being disclosed and shared, users are more than ever worried of their privacy risks, since the disclosed information might constitute higher potential losses (Kim et al. 2019). Contrarily to perceived risks, the concept of perceived benefits is associated to any kind of compensation (e.g. personalization, monetary, or social) a user might expect from disclosing personal

information (Jeff Smith et al. 2011). As previously mentioned, individuals are more likely to renounce a certain level of information privacy when the benefits outweigh the risks (Xu et al. 2011). Such personal weighting calculus, i.e. the cumulative effect of risks and benefits has been mentioned as perceived value according to Zeithaml (1988). Following Zeithaml (1988), Xu et al. (2011) mentioned that expected benefits should amplify the assessment on the utility of the disclosed information. In light what was previously stated, this research argues that not only there are different effects of perceived risks and benefits towards its perceived value output, but also the perceived value *per se* has a direct effect on user's continuance intention of using videoconferencing apps.

Privacy calculus has been studied as an antecedent of individuals' behavioral decisions, including self-information disclosure behavior, adoption behavior and intentions behavior (Xu et al. 2009). It posits individual's privacy interests as exchange where individual's disclose personal information in return of potential benefits (Xu et al. 2009). Perceived benefits represent the most favorable net of outcomes or any kind of compensation that may result from the disclosure of personal information to service providers (Jeff Smith et al. 2011). These benefits may include economic, social, personalization or convenience benefits (Jeff Smith et al. (2011), Wilson and Valacich 2012). On the contrary, perceived privacy risks represent the degree to which individuals think that there is a high potential for loss associated with the disclosure of personal information to the service providers (Malhotra et al. 2004). In a context manifested by ubiquity (Zhang et al. 2016) and uniqueness (in the sense as an emulator of face to face communications), where individuals engage in communication related to decision making, negotiations, discussion, instant feedback, and collaboration, privacy risks become more significant as VC app service providers may have access to large volumes of potentially personal and sensitive information (both the personal information of the participants and the sensitive information shared during the VC sessions). Applying the "second exchange" framework introduced by (Culnan and Bies 2003), information disclosure in VC apps is understood in this study as a non-monetary exchange where by choosing to use the VC apps, professionals ultimately disclose their personal information to the VC apps service providers and also risk exposing their sensitive information discussed during VC sessions in return for the benefits provided by VC apps. More specifically, professionals behave as if they are performing a risk benefit analysis (Privacy Calculus) that accounts for inhibitors and drivers of using VC apps. Consequently, disclosing their personal information and risking the information discussed during live VC sessions. Such personal weighting calculus, i.e. the cumulative effect of risks and benefits has been mentioned as perceived value according to Zeithaml (1988). Similar to prior literature (Xu et al. 2011, Shaw and Sergueeva, 2019; Wiegard and Breitner, 2019), this research argues that the professionals are likely to agree to give up a certain degree of privacy in return of potential benefits related with the VC apps usage.

VC apps through its unique characteristics of ubiquity and social presence offer unique advantages to professionals in terms of ease of use and their enhanced performance, effectiveness in competing work-related tasks. Thus, higher anticipation of VC apps benefits should lead to a higher perception of utility of VC apps leading to positive influence of perceived benefits on perceived achieved with using VC apps.

On the other hand, perceived privacy risk has been found to negatively influence perceptions of value (Xu et al., 2011; Shaw and Sergueeva, 2019; Wiegard and Breitner, 2019). In today's environment, mobile apps not only request personal information explicitly, but also automatically capture other information such as location, credit card information, time of the day, and past activities (Shaw and Sergueeva 2019). This is verified in the case of VC apps as Zoom automatically collects a variety of its users including their name, physical address, email address, phone number, job title and employer. Another example is while using Facebook, as soon as users login the platform will also collect information from their Facebook profile as well as any information that they create, upload and provide while using the service (Koch 2020). This automatic collection of wide variety of data increases the vulnerabilities and intrusion into one's life once the

collected data is aggregated and analyzed (Shaw and Sergueeva 2019). Furthermore, they enhance the visibly of individual's behavior and increases the scope of the situations that may be personally embarrassing to them (Xu et al. 2011). Thus, professional's assessment of utility from VC apps will be low if they perceive that there are high risks in using VC apps. Hence:

H7. *Perceived Risks have a negative effect on Perceived Value.*

H8. *Perceived Benefits have a positive effect on Perceived Value.*

3.6. THE ROLE OF PERCEIVED VALUE

There has been various conceptualization of perceived value noted in prior literature, but the most common remains the one proposed by Zeithaml (1988), where the author defines perceived value as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml 1988). Perceived value can therefore be thought of as an overall estimation of the choice object and once that overall estimation is internalized, it becomes a criterion for a consumer to decide their choice behavior (H. W. Kim et al., 2007; Xu et al., 2009) such as adoption intentions (Kim et al. 2007), use intentions (Shaw and Sergueeva 2019), or willingness to have personal information used by service vendors (Xu et al. 2009). While most of the extant literature has excluded perceived value as an explicit latent variable in the framework of privacy calculus model, Xu et al. (2011), Morosan and DeFranco (2015), Shaw and Sergueeva (2019), considered perceived value as an explicit variable that completes privacy calculus model, as it represents a natural evaluative artefact that aggregates the benefit risk assessment process of user's guiding their behavioral decisions (Morosan and DeFranco 2015). Similar to Xu et al. (2011), Morosan and DeFranco (2015), Shaw and Sergueeva (2019), this study also includes perceived value as a construct and part of the privacy calculus model. Following the conceptualization of Zeithaml (1988), this research therefore refers to perceived value of videoconferencing as the professional's overall perception of videoconferencing based on the consideration of benefits obtained from and sacrifices made to use it. Based on the above discussion, it is therefore hypothesized that higher utilitarian value derived from using VC apps motivates the professionals to continue using video-conferencing apps. Therefore:

H9. *Perceived value positively influences the continuance intentions to use VC apps.*

3.7. THE ROLE OF TECHNICALITY

Following the conceptualization of H. W. Kim et al. (2007), this study defines technicality of video-conferencing as the degree to which professionals perceive video-conferencing apps to be technically excellent in the terms of ease of use, reliability, connectivity, and efficiency. H. W. Kim et al. (2007) defined technicality as "the degree to which M-internet is perceived as being technically excellent in process of providing services" (Kim et al. 2007). According to H. W. Kim et al. (2007), the term technicality is determined by ease of use, system reliability, connectivity and efficiency. Ease of use represents the overall user-friendliness of using the system i.e., the degree to which the consumers perceive the use of the system to be free from physical and mental effort. System reliability represents whether the system is free from errors and is consistently available and secure. Connectivity represents the whether the connection is instant and straightforward. Efficiency represents whether the loading or response time is lower (Kim et al. 2007). Any

technical difficulty experienced while using a technology can hinder an individual from realizing the full benefits from a technology, and, consequently result in requirement to invest in cognitive effort to use a technology (Setterstrom, Pearson, and Orwig 2013). The technical difficulties may also bring psychological discomfort including anxiety and fear, frustration, discomfort, annoyance and mental fatigue (Kim et al. 2007). Also, research of IT adoption has suggested that when individuals experience deterrence in terms of anxiety and fear while using a technology, its use can be indirectly negatively affected (through psychological distancing) according to Stein et al. 2015. Regardless of whether the adoption decision pertains to initial usage or continuance usage, technicality remains a significant predictor in the development of individual's perceptions of value (Setterstrom et al. 2013). Technicality has traditionally been investigated as the predictor of perceived value with technicality negatively influencing the perceived value (S. Kim and Garrison , 2009; Setterstrom et al. , 2013).

In this study, the technicality concept is used to assess its moderating effects on the relationship between perceived value and intentions to use. It is believed that the effect of perceived value on continuance intentions is susceptible to change with the technicality experienced from VC apps usage. Specifically, this study posits that technicality positively moderates the relationship between perceived value and continuance intentions. This is due to the fact that the availability of the high-speed internet throughout the world continues to expand, the load and response times of video-conferencing apps continues to decrease (Raigani et al. 2014) resulting in lower physical and mental effort. The highly intuitive, user friendly, reliable, and efficient VC apps are, the stronger the effect of perceived value on continuance intentions to use. Thus:

H10. *Technicality negatively moderates the effect of Perceived Value on Continuance Intentions.*

3.8. CONTROL VARIABLES

Gender and age (Kordzadeh and Warren, 2017; Wu et al., 2014) are used as control variables in this study.

4. METHODOLOGY

4.1. MEASUREMENT

To collect the data, an instrument was developed, and a survey questionnaire was performed. As for the used constructs, they were adjusted mostly from published literature regarding MUIPC, ubiquity and privacy calculus contexts, as well as some self-developed constructs (as shown in Table 2 of the Appendix) using a seven-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

4.2. DATA COLLECTION

A survey instrument was developed and shared online on the LinkedIn professional social media network, via its direct messaging feature. To conduct the collection of data, a two-step approach took place. First, the "key informant" data collection approach (Pinsonneault and Kraemer, 1993) was performed. This was essential to identify fitting respondents to whom direct messages were sent on LinkedIn throughout eight consecutive weeks for two hours a day. Second, follow-up messages were sent to the users who did not express any kind of feedback or confirmation that the survey would be answered and submitted. This was translated in a total of 2471 direct messages sent to LinkedIn users, with 487 complete and valid responses, corresponding to a 19.7% response rate. The Kolmogorov–Smirnov (K–S) demonstrates the absence of non-response bias (Ryans 1974) while measuring the early and late respondents. Third, it was offered to the respondents the option of received the results of this study.

As for the common method bias, it was analyzed with the usage of Harman's one-factor test (Podsakoff et al. 2003), that confirmed the that none of the components singly defines the variance. The second way of analyzing the common method bias was using a marker viable approach (Lindell and Whitney 2001), with the addition of a theoretically irrelevant marker variable in the model, retrieving 0.023 (2.3%) as the maximum shared variance with other variables; which may be treated as low (Johnson, Rosen, and Djurdjevic 2011).

No significant common method bias was found and the most part of the respondents were qualified. The demographic characteristics are shown in Table 3 of the Appendix.

5. DATA ANALYSIS

To perform this research, the partial least squares (PLS) technique was utilized. The reason behind using the PLS technique relies on the fact that it its quite helpful to analyze topics that have never been used before (Teo et al., 2003; Ke et al., 2009). According to Goo et al. (2009), the PLS analysis enables the usage of formative indicators in order to model latent constructs. Furthermore, this technique mitigates the factor of restrictive distributional assumptions (at the moment path coefficients are being elaborated) being significantly different from zero (Goode et al., 2015; Gefen and Straub, 2005; Fornell and Bookstein, 1982). The PLS technique is an applicable technique for this research due to the fact that it includes formative constructs, it has never been tested before, and the variables are not normally distributed ($p < 0.01$, Kolmogorov–Smirnov's test) (Chin, Marcelin, and Newsted 2003).

5.1. MEASUREMENT MODEL

To assess the construct discriminatory validity of scales for the reflective constructs, indicator reliability, convergent validity and reliability, a measurement model was developed. The measurement model results are demonstrated in Tables 4, 5, and 6 of the Appendix.

The composite reliability (CR) was used to test construct reliability. As shown in Table 4 of the Appendix, the CR results are higher than 0.7 for all constructs, and according to Straub (1989) and Henseler et al. (2009), this indicates the suitability and internal consistency of the constructs. As for convergent validity, it was demonstrated with the usage of the average variance extracted (AVE). Table 4 of the Appendix shows that the AVE results are higher than 0.50 for all constructs, hence it is demonstrated the convergent validity of the measurement model (Hair et al., 2012; (Fornell and Larcker 1981). The loading should be higher than 0.7 in order to achieve indicator reliability (Henseler et al., 2009; Churchill, 1979), and due to this item PS1 from Perceived Surveillance (PS) and item C3 from the Continuity (Co) construct were removed due to low factor loading. Furthermore, Table 5 of the Appendix shows that all the loadings are higher than 0.7, therefore demonstrating indicator reliability.

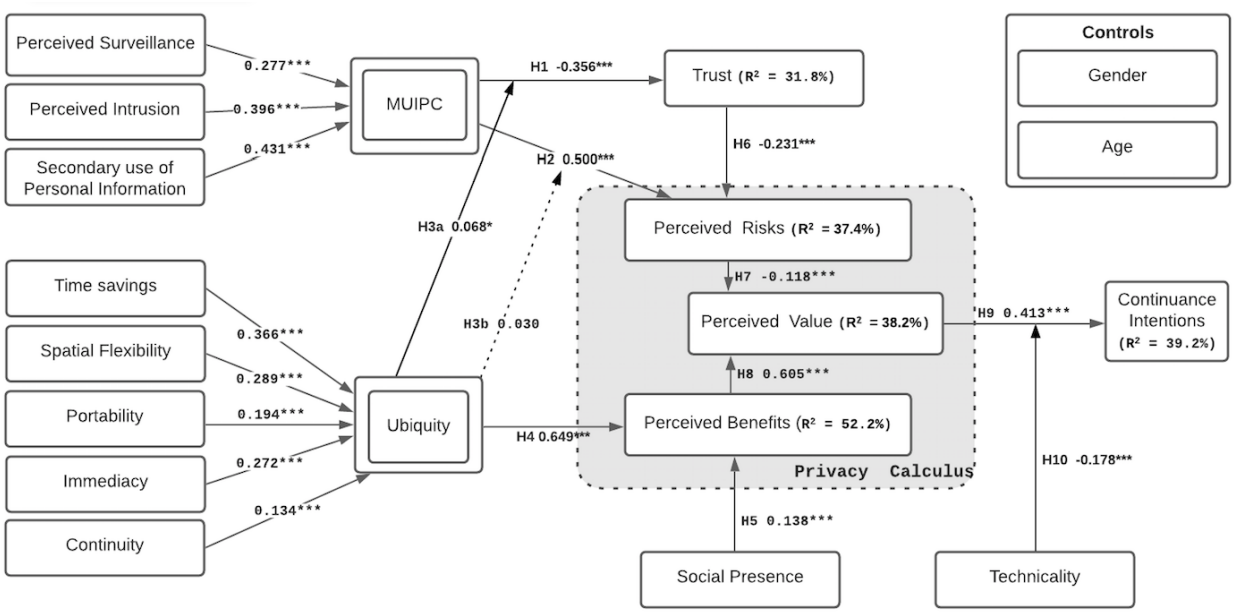
In order to assess the constructs' discriminant validity, cross-loadings, Fornell-Larcker criterion and heterotrait-monotrait ratio (HTMT) were performed (Henseler, Ringle, and Sarstedt 2015). The correlation between constructs and AVE squared root was used to assess discriminants validity of the constructs. Table 4 of the Appendix shows that the square root of each construct (in the diagonal position) is higher than the correlations between the constructs, hence, the first criterion for discriminant validity of the constructs is supported (Fornell and Larcker 1981). Also, in order to achieve discriminant validity, the second criterion was applied where the loadings (in bold) should be greater than cross-loadings (Chin 1998), supported in Table 5 of the Appendix. At last, discriminant validity is achieved as all the HTMT are lower than the threshold of 0.9 as seen in Table 6 of the Appendix. The results support the construct reliability of the measurement model. Therefore, the constructs were appropriate to test the structural model.

The MUIPC was modelled as a second-order construct of the reflective-formative type (Ringle, Sarstedt, and Straub 2012), with perceived surveillance, perceived intrusion and secondary use of personal information which are reflective themselves. The same was applied for ubiquity as a second-order construct, where time savings, spatial flexibility, portability, immediacy and continuity. Regarding the two formative constructs, a measurement model was executed to analyze the significance, the sign of weights and the multicollinearity.

The variance inflation factor (VIF) statistic was performed to assess the multicollinearity (Table 7 of the Appendix). As Table 7 of the Appendix demonstrates, the range of the VIF is between 1.461 (lowest) and 2.871 (highest). According to Lee and Xia (2010), the absence of multicollinearity among the variables is supported since the VIF values are below the threshold of 3.3. Furthermore, all weights are statistically significance, therefore one can conclude that the formative constructs also present a good measurement model.

5.2. TEST OF THE STRUCTURAL MODEL

The structural model (Figure 2) presents the variation explained, and the path coefficients. The significance levels of the hypothesized construct were performed using bootstrapping with 5000 resamples. All constructs present VIF lower than 1.467, this means that model does not present multicollinearity (Hair et al. 2017).



Note: *** p < 0.01; ** p < 0.05; * p < 0.10.

Figure 2. Structural model

The model explains 31.8% of variation in trust, confirms the negative effect of MUIPC (β= -0.356; p < 0.01) and the moderating effect of ubiquity (β= 0.068; p < 0.10) on trust. Consequently, H1 and H3a are supported.

The model explains 37.4% of the variation in perceived risks. Trust (β= -0.231; p < 0.01), alongside MUIPC (β= 0.500; p < 0.01) are statistically significant in explaining perceived risks of VC apps. However, the moderating role of ubiquity on the relation between MUIPC and perceived risks was not found to be significant. Therefore, H2 and H6 are supported, whereas H3b is not supported.

With regards to perceived value, the model explains 38.2% of its variation. Perceived risks (β= -0.118; p < 0.01) and perceived benefits (β= 0.605; p < 0.01) are found to be statistically significant in explaining perceived value of VC apps. Hence, H7 and H8 are supported.

The model also explains 52.2% of the variation in perceived benefits. The positive effect of ubiquity (β= 0.649; $p < 0.01$) and social presence (β= 0.138; $p < 0.01$) on the benefits of VC apps are statistically significant, thus supporting H4 and H5.

Finally, the model explains 39.2% of the variation in continuance intentions. The positive influence of perceived value (β= 0.413; $p < 0.01$), and the negative moderating effect of technicality (β= -0.178; $p < 0.01$) is also supported, thus confirming H9 and H10.

6. DISCUSSION

The objective of this study was to investigate and understand individual's willingness to continue using VC apps to collaborate with their peers for professional purposes despite the privacy risks associated with VC apps usage. To this end, this study developed a conceptual model rooted in the theoretical foundations of privacy calculus theory (Culnan and Armstrong, 1999; Dinev and Hart, 2006). Through a privacy calculus lens, it was argued that mobile user's information privacy concerns (MUIPC), trust, ubiquity, and social presence influences the way the professional's balance between disutility of the negative effect of using VC apps and the utility gained from using VC apps. Further, this study also investigates the moderation effect of technicality on the relationship between perceived value and continuance intentions.

The findings from the study indicate that MUIPC has a significant positive influence on perceived privacy risks associated with using VC apps (H2). The findings are consistent with those of Wiegard and Breitner (2019) in that mobile user's information privacy concerns positively affect user's perceived risk in adoption of pay-as-you-go services using wearable technology. The findings of the research indicate that professionals could more likely perceive VC apps as riskier to use due to the secondary use of their personal information by the VC app vendors without their consent, unwanted invasions into their personal information space by unauthorized intruders when using VC apps, and surveillance by VC apps vendors.

The findings indicate that Mobile users' information privacy concerns (MUIPC) have a negative influence on trust, thereby supporting H1. In accordance with the prior studies that revealed the negative influence of privacy concerns on trust (Zhou, 2011; Chang et al., 2017), the findings add to the existing literature in that MUIPC serves as an influential determinant for trust in VC apps. The study by (Chang et al. 2017) on user's trust in social network systems proved that privacy concerns have more negative influence on LinkedIn user's trust than Facebook user's trust to the SNS (Social Networking Site). User's post their work-related information on LinkedIn for professional purposes and the information disclosure on LinkedIn may be confidential between job seekers and providers or other groups with similar professional interests. Users would like their information to be expedited as highly sensitive by anyone in their professional group so this network or relationship on LinkedIn can be trusted. Hence LinkedIn user's privacy concerns cause more harm to user's trust (Chang et al. 2017). Similarly, the findings of this research suggest that professional's share their work-related information with their peers on VC apps and the information shared during live sessions using VC apps may be confidential. Just like LinkedIn users, VC apps users would like their information prioritized as highly sensitive by their peers and VC app vendors. Hence any concerns' regarding the loss of their confidential information may cause more harm to users' trust in VC apps vendors.

The findings also indicated that trust positively influences privacy risks, thereby supporting H7. The findings indicate that the effect of MUIPC on privacy risks is lowered when professionals believe that VC app vendors are trustworthy. The positive effect of trust on privacy concerns might also go towards explaining why professional's privacy attitudes do not predict their actual behavior (Joinson et al. 2010). These findings are in line with the study by Ozturk et al. (2017) in that consumer's trust in mobile hotel booking vendors can significantly lower user's perceived privacy risks in using the mobile hotel booking. The findings confirm that the moderating effect of perceived ubiquity on the relationship between MUIPC and trust is statistically significant, thereby supporting H3a. On the contrary, the moderating effect of perceived ubiquity on the relationship between MUIPC and perceived risks is not statistically significant, thereby not supporting H3b. One possible explanation for this may be the strength of the relationship between MUIPC and trust and MUIPC and perceived risks. As noted by Okazaki et al. (2009), the magnitude of the impact of the moderator may depend upon the relationship that it is set to modify. The stronger the relationship between the constructs which the moderator is set to modify, less influence the moderator has on the relationship (Okazaki et al. 2009). In line with Okazaki et al. (2009), in this research, the

relationship between MUIPC and trust is not as strong as the relationship between MUIPC and perceived risks leading to the influence of perceived ubiquity on the relationship between MUIPC and trust and not on MUIPC and perceived risks.

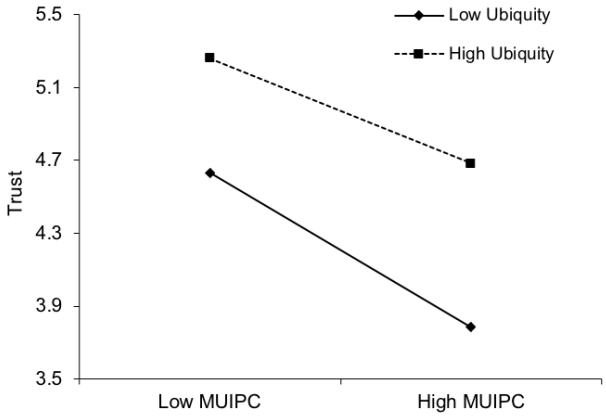


Fig. 3a. Moderation effect of ubiquity in MUIPC on Trust

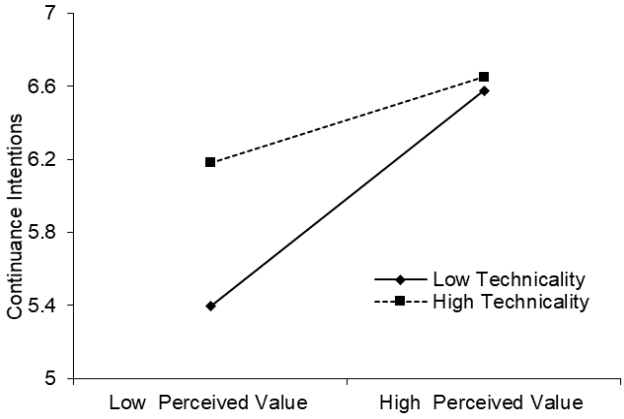


Fig. 3b. Moderation effect of technicality in perceived value on continuance intentions

The findings also demonstrate that both ubiquity and social presence influences professional's perceptions of the benefits of using VC apps, supporting H4 and H5 respectively. The findings suggest that the unique ubiquity feature of VC apps in specific is the crucial aspect of usefulness for VC apps. Professionals consider VC apps very beneficial due to their embedded ubiquity characteristics offering communication services at any time anywhere. Ubiquitous connectivity enables the professionals to maintain seamless, connection with their peers around the clock, which is the main reason professionals are using VC apps. Professionals can derive benefits from communicating with their peers instantly and constantly via mobile VC apps i.e., by accessing VC apps services in a continuous and immediate way, professionals are able to complete their task effectively and efficiently, despite their geographical differences. As such the findings are consistent with those of prior studies that confirm that ubiquity and social presence positively influences users' perceived benefits including enhanced performance and usefulness. With regards to ubiquity, Brown et al. (2010) confirm that the ability of users to quickly communicate with their peers through collaborative technologies positively influences their performance. Similarly, in a study of cloud computing, Arpaci (2016) found that student's perceptions regarding un-interrupted connection and access to personal data at anytime and anywhere through mobile cloud computing storage positively influences the perceived usefulness, which in turn influences their positive attitude. Just like in the Arpaci (2016) research, the results of this study also suggest that the professionals believe that the constant connection and ability to communicate with the peers at anytime and anywhere through VC apps would increase their productivity, enhance their effectiveness, improve their performance and ease their tasks. Another study by Ltifi (2018) on mobile commerce found that the users' ability to shop with the flexibility of time and space through the mobile devices positively influences their perceptions of utilitarian values (usefulness and ease of use are considered utilitarian values) of using mobile services, thereby encouraging them to make online purchases. In the context of smartphone-based m-commerce, Choi (2018) also proved that users' ability to conduct m-commerce anytime and anywhere, irrespective of time and space (service ubiquity) enhances users' perceived usefulness. The findings of the study by Choi (2016) implied that the ability to maintain seamless, constant connection with the friends and

family and colleagues around the world (ubiquitous connectivity) through the social network systems is the main reason for the users to use social network systems. In the same line, Ltifi (2018) also concluded that the availability and possibility of realizing the services at anytime and anywhere can provoke positive reactions in users' including intentions, to live experience and behavior (Ltifi 2018).

With regards to social presence, the findings of this research indicate that by mimicking natural face to face communications using both audio and video, VC apps creates significant perceptions of human closeness and warmth, which then enhances professionals' performance, efficiency, and effectiveness in completing work related tasks. Hence, when professionals perceive that mobile VC apps promotes professionals to develop warm, close and personal relationships with their peers, they can obtain more benefits from using it. Given that most professionals are using VC apps for collaborating with their peers, it is noteworthy to believe that greater social presence results in greater benefits. The findings are in line with prior study of Brown et al. (2010) where it was proved that the ability of user's to psychologically feel that the other person in the communication media is a real person positively enhances their performance expectancy. Huang (2017) proved that social presence positively influences students' perceptions of usefulness in using team messaging service, which further positively influences their behavioral intentions towards messaging service. Similarly in a study on electronic human and non-human feedback systems (Walter, Ortbach, and Niehaves 2015), it has been found that social presence has a direct positive influence on perceived feedback usefulness.

However, both ubiquity and social presence exert different effects in terms of the magnitude. For instance: the influence of ubiquity is stronger than that of social presence on perceived benefits. The above observation highlights that when seeking benefits, professionals tend to consider ubiquity as having higher value than social presence indicating it as a significant factor in enhancing professional's perceptions of benefits in continuing to use mobile VC apps. Chen & Yao (2018) reported that consumers have strong feelings regarding ubiquity of the mobile auctions, and it positively influences consumer's positive effect which in turn drives their impulsive buying behavior in mobile auctions. Also, Chen & Yao (2018) further note that the mobile auction providers operators should continue to build a consumption environment that provides instant services (ubiquity), thereby encouraging the users to enhance their impulsive buying behavior (Chen and Yao 2018). Nevertheless, the negative relationship between perceived risks and perceived value (H7), and the positive relationship between perceived benefits and perceived value (H8) were found significant. The findings of the research indicate that professional's indeed form and articulate their own assessment of value based on the perceived risks and benefits associated with using VC apps, as originally purported by privacy calculus theory. However, compared with perceived risks, the benefits that the professionals' think will receive from using VC apps influence will bring more value. These results indicate that when using VC apps, professionals' perceptions of value are strongly influenced by potential benefits received from using VC apps than that of potential risks associated with using VC apps. More specifically, the role of perceived benefits as the stronger influencer of value indicates the crucial role of VC apps in enhancing professional's performance, effectiveness and usefulness, when collaborating with their peers for professional purposes. In addition, the findings may also indicate the existence of a privacy paradox, which could also make professionals overcome their perceptions of risks and choose to continue using VC apps. This major finding match that of a prior study about consumer's decision-making process for location-aware marketing (LAM) in that consumer's place greater value on the customized messages received from disclosing personal information in LAM than privacy risks associated with disclosing personal information in LAM (Xu et al. 2011). Another study that supports the findings revealed that when using mobile applications, individuals' assign higher value to potential rewards than to perceived risks (Wang et al. 2016). Another study (Morosan and DeFranco 2015) also proved that consumer's perceptions of value are strongly influenced by the perceived benefits and positive emotions than perceived risks and negative emotions.

The findings also indicated the positive influence of perceived value on intentions to continue using VC apps, thereby supporting H9. The findings indicate that perceived value motivates the professionals to continue using VC apps and shapes their perception as they evaluate the risk benefit trade off, they are making when using VC apps. The findings are consistent with past studies of users of mobile services (Shaw & Sergueeva, 2019; C. Wang et al., 2020) in that users engage in mobile services as long it has a value for them.

The findings also indicate that technicality moderates the relationship between perceived value and continuance intentions to use VC apps (H10). The findings suggest that professionals may perceive VC apps as more valuable and therefore, continue using them if they feel VC apps as more intuitive and user friendly and deliver excellent experience in terms of call quality, faster connectivity, lower dropped calls, reliable connection, and compatibility across various operating systems. Any experience of dropped calls, delayed connection, poor call quality or lag, reliability issues, and software in-compatibility may only lead the professionals' to feel frustrated while using VC apps especially in those instances when technical difficulties listed above last for a long time (Archibald et al. 2019).

6.1. THEORETICAL CONTRIBUTION

The study attempted to explain VC apps intentions with the dual path model that was built using privacy calculus theory. Through the theoretical lens of privacy calculus, the dual path model successfully united social presence theory, mobile users' information privacy concerns (MUIPC), and ubiquity, a unique characteristic of mobile services. The dual path model provides a moderate level of predictive accuracy (R^2= .392) for VC apps' continuance intentions. These results indicate the use of proposed dual path model for examining continuance intentions in the context of VC apps; hence the proposed model offer contributions to literature primarily in the areas of communication technologies, information privacy, privacy paradox and professionals' continuance intentions to use video-conferencing apps.

First, this study is the first one to investigate relationships relating to the privacy calculus (Dinev and Hart 2006) in the context of mobile videoconferencing apps. As videoconferencing represents a unique environment in which its usage and ultimately disclosure of the personal information could be rewarding, but at the same time risky, this study's investigation of the relationships that are crucial for continuance usage of VC apps, and thus laying the foundation for extra appropriated value for both VC app users and service providers, is crucial to the advancement of video-conferencing literature. By doing so, this study also enhances the understanding of the dichotomy of individuals' attitude and behavior towards VC apps usage in professional context as well as calculus in their decisions to use VC apps at individual levels despite the glaring privacy issues these apps suffer from.

Second, this study extends the privacy calculus theory by incorporating MUIPC (Xu et al. 2012), trust, social presence, ubiquity, and technicality to the privacy calculus model and applying an extended model to the context of video-conferencing usage for professional purposes. By applying privacy calculus to a new context, this study investigates the predictors of consumers' intentions to use a new kind of technology i.e., VC apps from a privacy calculus prospective. The findings of the study suggest that individuals' risk benefit analysis yields a perceived value, which is a crucial determinant of professionals' intentions to use VC apps.

Finally, so far, no study has investigated the moderating effect of technicality on the relationship between perceived value and continuance intentions. Prior studies (Kim et al. 2007; Wang and Petrison 1993) have regarded technicality as an antecedent of perceived value. By considering technicality as the moderator, this study opens a new path of research where researchers can study different dimensions of technicality individually such as connectivity, ease of use, service reliability, compatibility to investigate which dimension moderates the relationship between perceived value and continuance intentions.

6.2. MANAGERIAL IMPLICATIONS

From a practical perspective, the findings of this research offer benefits for VC apps designers/developers and privacy policy makers. Understanding the benefits and risks associated with VC apps usage can help VC apps designers/ developers address individuals' privacy concerns, privacy risks, improve the benefits of using VC for professional purposes and enhance professionals' participation in VC apps. This participation can eventually promote growth and success of the VC apps.

Professionals' who engage in communications using VC apps want to receive value. Since the findings indicate that both ubiquity and social presence of VC apps profoundly shape individuals' perceptions of benefits achieved using VC apps in professional context, which then positively influences their perceptions of value, the VC apps vendors are suggested to encourage VC apps usage by instilling the features that yields higher ubiquity and social presence and deliver more continuous, personal and humanizing experience. For instance: VC apps vendors can enhance ubiquity by enhancing their back end systems including databases and servers to provide reliable and immediate access to services (Zhou 2012). VC apps can be imbued with several presence establishing strategies including simple interface functionalities such as synchronicity (Park and Sundar 2015), and adding more non-verbal cues such as gestures, humorous content and emoticons (Ye et al. 2020).

Although individuals consider VC apps as more beneficial in professional context, they also consider VC apps as riskier due to the fear of continuous monitoring of their activities by VC app vendors, unauthorized access to their personal information by the unauthorized individuals, and concern that that their personal information can be used for other purposes or sold to third parties without their consent. The findings suggest that VC app vendors should work towards utilizing the potential of their privacy policies to reduce user's perceptions of the risks inherent in the mobile VC apps. Prior research (Balapour, Nikkhah, and Sabherwal 2020) found that privacy policies play an integral role in predicting the security of the mobile apps. Privacy policies actively communicates the precursors, security strategies, and measures taken to protect users' sensitive data. Hence, when the individuals perceive the privacy policies to be effective, their perceptions of security increases and consequently their risks perception inherent in the apps decreases (Balapour et al. 2020). Hence, VC app vendors should provide clear, concise, accessible and understandable privacy disclosures at appropriate time describing the nature and scope of the data collection. Providing details about which, when and how users' personal information can be collected and used at point in time when it matters the most to the consumers (i.e., just prior to downloading the VC apps and just before collection of the information by VC apps) can enable the users' to make informed decisions about whether to use the app or allow collection of privacy-sensitive information (Ozturk et al. 2017). Prior literature on privacy (Culnan & Armstrong, 1999; Xu et al., 2008) notes that individuals' perceptions of control over their personal information can reduce individuals' perceptions of intrusion. The organization's privacy assurance interventions through privacy policies can significantly enhance individuals control over their personal information and thereby mitigate perceptions of intrusion (Xu et al. 2008). Through their privacy policies, they can be more transparent to their consumers regarding what happens to their data. By offering more information about how their personal information would be collected, stored, and used as well as offering assurances about preventative measures taken to protect sensitive data might alleviate some of the concerns (Plangger and Montecchi 2020). In their privacy policies, VC app vendors should clearly communicate the benefits of collected data for instance added convenience, enhanced services (Plangger and Montecchi 2020), while at the same time ensure the users' that their data is not sold to third parties without their consent, thereby eliminating the fear of loss or misuse of the collected data (Wiegard and Breitner 2019). In addition, they should commit to their promises on Information usage and sharing. They can't use personal information for the purposes otherwise described in their privacy policies or share it with third parties without users' consent or sell it for profits. Otherwise users' may feel that their benefits are hurt (Zhou 2011). Strong security mechanisms such as end to end encrypted video calls and

strong password enabled meeting links need to be thought through when designing VC apps, thereby preventing intruders from intruding into and monitoring users' calls and access sensitive private information. Currently, mobile app vendors try to meet only minimal standards of privacy and security guidelines set by industry standards. By raising consumers awareness, VC app vendors can prevent security incidents and unwanted privacy disclosures (Balapour et al. 2020). For instance, VC app vendors can provide examples and demonstrations in their privacy policies in order to show how the security and unwanted privacy violations can take place (Balapour et al. 2020).

David Sullivan, director of learning and development at the Global Network Initiative argued that individuals' use products that work and it is unreasonable to expect that every individual to perform security audit of the conferencing apps they are using (Aiken 2020). Hence, it becomes very crucial for the companies to consider the human rights risks arising from their products and services ahead of time (Aiken 2020). Furthermore, in order to reduce users' concerns about the perceived surveillance, VC app vendors can employ a similar approach to pseudonym personalization, where user using the apps is given a special pseudonym and the personalization system is arranged in such a way that instead of users' real identity, special pseudonym is tracked across various sessions. With the similar approach, VC apps vendors can reduce users' concerns about VC apps monitoring users' activities as the VC services will be provided to the user in the similar manner but with the only difference that VC apps don't know the real identity behind the pseudonym (Frank and Harnisch 2014).

The findings also suggest that transparent privacy policies, strong security mechanisms, and better cyber security policies are few things that VC apps vendors can proactively do to make professionals believe that VC apps vendors are trustworthy. For instance: to enhance users' trust, VC app vendors can adopt a *trusted model*, where the VC apps vendors can work with the trusted third party and external entity who can certify VC apps' privacy practices. Certified VC apps vendors can then display a privacy seal on their websites to exhibit that their application has been verified and they comply with the regulatory framework. Displaying privacy seals can boost user's trust and confidence in users of VC apps' services, thereby reducing perceived risks in using VC apps (Ozturk et al. 2017). VC apps vendors should also note that displaying privacy seals cannot always be effective in directly mitigating professionals' perceptions of risks and intrusion in the industries where the industries have their own standards and have stricter government regulations for protecting sensitive information (e.g., healthcare, finance industries). Hence, in addition to privacy seals, VC apps vendors through privacy assurance interventions can assure the professionals' that effort has been made to protect their personal information and they exercise significant control over the collection and use of their personal information (Xu et al. 2008). For instance: VC app vendors through their privacy policies can assure the consumers that their personal information is held in a protective domain and protective safeguards are in place to protect the personal information from getting lost, stolen or altered. VC apps through their privacy policies can inform the professionals about the choices available to them about how their information will be used, how the professionals' can update or correct any errors in their information. Lastly, prescription of notification and consent can inform the consumers' about the procedural fairness of the VC apps and can significantly enhance professionals' perceptions of control over the personal information and trust in VC apps (Xu et al. 2008). Moreover, VC apps should list the app permissions and display how the app uses the collected information from each permission and the rationale of information collection. Given the lack of clarity of why the apps access their personal information, users have to deal with the uncertainties when making trust decisions regarding downloading or using an app. Providing the users' with the reasons why their information is collected not only enable the users' to make better trust decisions, but also lower their privacy concerns caused by uncertainties (Lin et al. 2012). Providing such information can enhance transparency and user' trust in the apps and encourage them to continue using the apps.

However, considering the fact that technicality can mediate the relationship between perceived value and continuance intentions to use, it is suggested that VC apps vendors should design the VC apps in such a way that

they are user-friendly, ease to use, connect faster, and reliable in terms of faster connectivity, fewer in session interruption, lower dropped calls and software compatibility. VC app vendors can continuously improve their current services by offering enhanced performance and functionalities, and support for compatibility across various operating systems (Archibald et al. 2019).

Furthermore, the findings of this research benefit the government agencies such as the Federal Communications Commission (FCC) which regulates interstate and international communication by radio, TV, wire, satellite and cable in the United States. Understanding privacy concerns and risks in VC apps usage can assist these agencies to extend the communication and privacy laws to help protect individuals' privacy in the virtual world. The government agencies can emphasize to reduce the dichotomy between users' privacy attitudes and behavior by passing the laws that mandate the operating systems to introduce a privacy attitude behavior check feature that mimics the privacy discrepancy interface introduced by (Jackson and Wang 2018). As noted by Jackson & Wang (2018), the inconsistencies between users' attitude and concerns may be the result of three reasons (1) mobile users' may not be able to understand the implication of the permissions specifically when the users' are not tech savvy (2) users' are often uncertain about their privacy preferences (3) and their preferences may change over time. Currently, the Android or Macintosh permission framework only lists the resources (such as location, contact list, camera, microphone etc.) an app can access, and the users select few or all permissions for each application. However, it doesn't show the users' any discrepancy between their attitude and behavior. By privacy attitude behavior check feature, Android or Macintosh can initially survey the users about their general concerns regarding surveillance, intrusion, and secondary use of information from mobile apps, and later display the list of permissions of the mobile app the user is downloading. Next it can enable the users to select/ unselect the app permissions and based on their selected permissions, can then predict the privacy risk associated with each selected permission and later display the charts showing the discrepancy in users' attitude and behavior. By bringing the inconsistency between users' attitude and behavior to the forefront, Android and Macintosh can nudge the users to make decisions in line with their privacy attitudes i.e., either review/adjust the app permissions or download/not download the app (Chang et al. 2017).

7. CONCLUSION

This study aimed to improve the understanding of individual attitude and behavior of professionals towards VC apps usage despite the stark contradiction between its recognized benefits and information privacy concerns. To comprehensively evaluate the factors influencing VC app use, a proposal and evaluation of conceptual research model based on data collected from 487 professionals was set. The study sheds light on the role that information privacy concerns, ubiquity, and social presence play in professionals' assessment of perceived benefits and risks. The dual paths of privacy calculus explain the perceived value of VC apps, and ultimately its continuing use. Although this study provided several theoretical and practical implications, this study is not free from its limitations.

The research omitted several important factors such as that could affect professionals' perceptions of perceived value in using VC apps such as perceived fees, synchronicity, system quality, and service quality. Another study can be conducted by using these factors as predictors of professionals' continuance intentions to use VC apps.

Second, the collection of the data at a single point in time may serve as a limitation to the findings of this study. However, measurement of a specific technology's continuance use is more likely to involve retrospective analysis. Therefore, future studies can be conducted by carrying out longitudinal investigation to obtain more convincing explanations on how professionals' perceptions towards VC apps changes over time.

Third, the collection of the data during the COVID-19 pandemic may also have served as a limitation to the findings of this study. It would be interesting to conduct the same research after COVID-19 pandemic to see if the professionals' perceptions of continuing to use VC apps at individual level remain the same or not.

Fourth, the study did not measure actual usage of VC apps. Although continuance intentions is a valid predictor of user's post adoption behavior and specifically "so in the continuance contexts where users are already using the target IT, it should be noted that intention (a mental predisposition) is not the equivalent of behavior (an actual act) and that there may be cases where individuals may intend to act in a certain way but yet act very differently from their intentions" (Bhattacherjee and Barfar 2011). Also, the success of a target technology can only be realized if a significant number of customers continue to use it on a continued basis or infuse it as a normal activity (Bhattacherjee 2001). Therefore, it is very crucial for continuance research to operationalize and measure actual IT usage behavior in addition to continuance intentions (Bhattacherjee and Barfar 2011). Therefore, a future study may be conducted in order to investigate the professionals' actual usage of VC for professional purposes.

Lastly, this study is only restricted to a European sample and thereby did not consider the cultural differences between different countries. It would be advisable to investigate whether the findings hold true for the professionals in other countries such as the USA, Australia, and countries in Asia. Hence, this study can be extended by conducting a comparative study of professionals' intentions to continuously use VC apps between different countries and cultures.

8. REFERENCES

Ahmad, Tabrez. 2020. "Corona Virus (COVID-19) Pandemic and Work from Home: Challenges of Cybercrimes and Cybersecurity." *SSRN Electronic Journal*.

Aiken, Adam. 2020. "Zooming in on Privacy Concerns: Video App Zoom Is Surging in Popularity. In Our Rush to Stay Connected, We Need to Make Security Checks and Not Reveal More than We Think." *Index on Censorship* 49(2):24–27.

Anckar, Bill, and Davide D'Incau. 2002. "Value Creation in Mobile Commerce: Findings from a Consumer Survey." *Journal of Information Technology Theory and Application JITTA* 4(1):43–65.

Animesh, Animesh, Alain Pinsonneault, Sung Byung Yang, and Wonseok Oh. 2011. "An Odyssey into Virtual Worlds: Exploring the Impacts of Technological and Spatial Environments on Intention to Purchase Virtual Products." *MIS Quarterly: Management Information Systems* 35(3):789–810.

Anwar, N., S. Mohamed Shuhidan, and M. K. Zaini. 2020. "Measuring Users Concerns for Information Privacy." in *Journal of Physics: Conference Series*. Vol. 1496.

Archibald, Mandy M., Rachel C. Ambagtsheer, Mavourneen G. Casey, and Michael Lawless. 2019. "Using Zoom Videoconferencing for Qualitative Data Collection: Perceptions and Experiences of Researchers and Participants." *International Journal of Qualitative Methods* 18.

Armfield, Nigel R., Madeleine Bradford, and Natalie K. Bradford. 2015. "The Clinical Use of Skype-For Which Patients, with Which Problems and in Which Settings? A Snapshot Review of the Literature." *International Journal of Medical Informatics* 84(10):737–42.

Arpaci, Ibrahim. 2016. "Understanding and Predicting Students' Intention to Use Mobile Cloud Storage Services." *Computers in Human Behavior* 58:150–57.

Balapour, Ali, Hamid Reza Nikkhah, and Rajiv Sabherwal. 2020. "Mobile Application Security: Role of Perceived Privacy as the Predictor of Security Perceptions." *International Journal of Information Management* 52.

Balasubramanian, Sridhar, Robert A. Peterson, and Sirkka L. Jarvenpaa. 2002. "Exploring the Implications of M-Commerce for Markets and Marketing." *Journal of the Academy of Marketing Science* 30(4):348–61.

Bansal, Gaurav, Fatemeh Mariam Zahedi, and David Gefen. 2016. "Do Context and Personality Matter? Trust and Privacy Concerns in Disclosing Private Information Online." *Information and Management* 53(1):1–21.

Barnes, Stuart J. 2002. "Wireless Digital Advertising: Nature and Implications." *International Journal of Advertising* 21(3):399–420.

Bélanger, France, and Lemuria Carter. 2008. "Trust and Risk in E-Government Adoption." *Journal of Strategic Information Systems* 17(2):165–76.

Belanger, France, and Robert E. Crossler. 2019. "Dealing with Digital Traces: Understanding Protective Behaviors on Mobile Devices." *Journal of Strategic Information Systems* 28(1):34–49.

Bélanger, France, and Robert E. Crossler. 2011. "Privacy in the Digital Age: A Review of Information Privacy Research in Information Systems." *MIS Quarterly: Management Information Systems* 35(4):1017–41.

Belanger, France, Janine S. Hiller, and Wanda J. Smith. 2002. "Trustworthiness in Electronic Commerce: The Role of Privacy, Security, and Site Attributes." *Journal of Strategic Information Systems* 11(3–4):245–70.

Bente, Gary, Sabine Rüggenberg, Nicole C. Krämer, and Felix Eschenburg. 2008. "Avatar-Mediated Networking: Increasing Social Presence and Interpersonal Trust in Net-Based Collaborations." *Human Communication Research* 34(2):287–318.

Berezowska, Aleksandra, Arnout R. H. Fischer, Amber Ronteltap, Ivo A. van der Lans, and Hans C. M. van Trijp. 2015. "Consumer Adoption of Personalised Nutrition Services from the Perspective of a Risk–Benefit Trade-Off." *Genes and Nutrition* 10(6).

Bhattacherjee, Anol. 2001. "Understanding Information Systems Continuance: An Expectation-Confirmation Model." *MIS Quarterly: Management Information Systems* 25(3):351–70.

Bhattacherjee, Anol, and Arash Barfar. 2011. "Information Technology Continuance Research: Current State and Future Directions." *Asia Pacific Journal of Information Systems* 21(2):1–18.

Billingsley, Luanne. 2020. "Using Video Conferencing Applications to Share the Death Experience During the COVID-19 Pandemic." *Journal of*

Radiology Nursing 39(4):275–77.

Biocca, Frank, Chad Harms, and Judee K. Burgoon. 2003. "Toward a More Robust Theory and Measure of Social Presence: Review and Suggested Criteria." *Presence: Teleoperators and Virtual Environments* 12(5):456–80.

Brewster, Thomas. 2020. "Why Zoom Really Needs Better Privacy: $1.4 Million Orders Show The US Government's COVID-19 Response Is Now Relying On It." *Forbes.Com*. Retrieved January 10, 2021 (https://www.forbes.com/sites/thomasbrewster/2020/04/02/why-zoom-really-needs-better-privacy-13-million-orders-show-the-us-governments-covid-19-response-is-now-relying-on-it/?sh=1285ce4177e8#7882170e77e8).

Brown, Susan, Alan Dennis, and Viswanath Venkatesh. 2010. "Predicting Collaboration Technology Use: Integrating Technology Adoption and Collaboration Research." *Journal of Management Information Systems* 27(2):9–54.

Bruner, Jerome. 1966. *Toward a Theory of Instruction*. Vol. 7. London: The Belknap Press of Harvard University Press.

Carlson, John R., and Robert W. Zmud. 1999. "Channel Expansion Theory and the Experiential Nature of Media Richness Perceptions." *Academy of Management Journal* 42(2):153–70.

Chang, Shuchih Ernest, Anne Yenching Liu, and Wei Cheng Shen. 2017. "User Trust in Social Networking Services: A Comparison of Facebook and LinkedIn." *Computers in Human Behavior*.

Chatterjee, Sutirtha, Suranjan Chakraborty, Saonee Sarker, Suprateek Sarker, and Francis Y. Lau. 2009. "Examining the Success Factors for Mobile Work in Healthcare: A Deductive Study." *Decision Support Systems* 46(3):620–33.

Chen, Chia Chen, and Jun You Yao. 2018. "What Drives Impulse Buying Behaviors in a Mobile Auction? The Perspective of the Stimulus-Organism-Response Model." *Telematics and Informatics* 35(5):1249–62.

Chin, Wynne W. 1998. "Issues and Opinion on Structural Equation Modeling." *MIS Quarterly: Management Information Systems* 22(1):7–16.

Chin, Wynne W., Barbara L. Marcelin, and Peter R. Newsted. 2003. "A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study." *Information Systems Research* 14(2):189–217.

Choi, Sujeong. 2016. "The Flipside of Ubiquitous Connectivity Enabled by Smartphone-Based Social Networking Service: Social Presence and Privacy Concern." *Computers in Human Behavior* 65:325–33.

Choi, Sujeong. 2018. "What Promotes Smartphone-Based Mobile Commerce? Mobile-Specific and Self-Service Characteristics." *Internet Research* 28(1):105–22.

Chryssochoidis, George, Anna Strada, and Athanasios Krystallis. 2009. "Public Trust in Institutions and Information Sources Regarding Risk Management and Communication: Towards Integrating Extant Knowledge." *Journal of Risk Research* 12(2):137–85.

Churchill, Gilbert A. 1979. "A Paradigm for Developing Better Measures of Marketing Constructs." *Journal of Marketing Research* 16(1):64–73.

Clark, Tom C., and Alan F. Westin. 1968. *Privacy and Freedom*. Vol. 56.

Clarke, Dylan. 2017. "End to End Security Is Not Enough (Transcript of Discussion)." Pp. 268–77 in *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*. Vol. 10476 LNCS.

Crano, William D. 1995. "Attitude Strength and Vested Interest." Pp. 131–57 in *Attitude Strength: Antecedents and Consequences*.

Culnan, Mary J., and Pamela K. Armstrong. 1999. "Information Privacy Concerns, Procedural Fairness, and Impersonal Trust: An Empirical Investigation." *Organization Science* 10(1):104–15.

Culnan, Mary J., and Robert J. Bies. 2003. "Consumer Privacy: Balancing Economic and Justice Considerations." *Journal of Social Issues* 59(2):323–42.

Davis, Fred D. 1989. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology." *MIS Quarterly: Management Information Systems* 13(3):319–39.

Degirmenci, Kenan. 2020. "Mobile Users' Information Privacy Concerns and the Role of App Permission Requests." *International Journal of Information Management* 50:261–72.

Dennis, Alan R., Robert M. Fuller, and Joseph S. Valacich. 2008. "Media, Tasks, and Communication Processes: A Theory of Media Synchronicity." *MIS Quarterly: Management Information Systems* 32(3):575–600.

Dickson Adom, Mavis Osei, Joe Adu-Agyem. 2020. “COVID-19 Lockdown: A Review of an Alternative to the Traditional Approach to Research.” *Research Journal in Advanced Social Sciences* 1:1–9.

Dinev, Tamara, Massimo Bellotto, Paul Hart, Vincenzo Russo, Ilaria Serra, and Christian Colautti. 2006. “Internet Users’ Privacy Concerns and Beliefs about Government Surveillance: An Exploratory Study of Differences between Italy and the United States.” *Journal of Global Information Management* 14(4):57–91.

Dinev, Tamara, and Paul Hart. 2006. “An Extended Privacy Calculus Model for E-Commerce Transactions.” *Information Systems Research* 17(1):61–80.

Dudding, Carol C. 2009. “Digital Videoconferencing: Applications across the Disciplines.” *Communication Disorders Quarterly* 30(3):178–82.

Feldman, Laurence P., and Jacob Hornik. 1981. “The Use of Time: An Integrated Conceptual Model.” *Journal of Consumer Research* 7(4):407.

Fornell, Claes, and Fred L. Bookstein. 1982. “Two Structural Equation Models: LISREL and PLS Applied to Consumer Exit-Voice Theory.” *Journal of Marketing Research* 19(4):440–52.

Fornell, Claes, and David F. Larcker. 1981. “Evaluating Structural Equation Models with Unobservable Variables and Measurement Error.” *Journal of Marketing Research* 18(1):39.

Frank, Johannes, and Michael J. Harnisch. 2014. “Review on Benefits and Risks of Personalization and Solutions for Privacy Concerns.” *Computer Communication & Collaboration* 2(1):35–46.

Fulk, Janet. 1993. “Social Construction of Communication Technology.” *Academy of Management Journal* 36(5):921–50.

Garfield, Monica J. 2005. “Acceptance of Ubiquitous Computing.” *Information Systems Management* 22(4):24–31.

Gefen, David, and Detmar Straub. 2005. “A Practical Guide To Factorial Validity Using PLS-Graph: Tutorial And Annotated Example.” *Communications of the Association for Information Systems* 16:91–109.

Goo, Jahyun, Rajiv Kishore, H. R. Rao, and Kichan Nam. 2009. “The Role of Service Level Agreements in Relational Management of Information Technology Outsourcing: An Empirical Study.” *MIS Quarterly: Management Information Systems* 33(1):119–46.

Goode, Sigi, Chinho Lin, Jacob C. Tsai, and James J. Jiang. 2015. “Rethinking the Role of Security in Client Satisfaction with Software-as-a-Service (SaaS) Providers.” *Decision Support Systems* 70:73–85.

Goodhue, Dale L., and Ronald L. Thompson. 1995. “Task-Technology Fit and Individual Performance.” *MIS Quarterly: Management Information Systems* 19(2):213–33.

Gray, Lisa M., Gina Wong-Wylie, Gwen R. Rempel, and Karen Cook. 2020. “Expanding Qualitative Research Interviewing Strategies: Zoom Video Communications.” *Qualitative Report* 25(5):1292–1301.

Gruzd, Anatoliy, Kathleen Staves, and Amanda Wilk. 2012. “Connected Scholars: Examining the Role of Social Media in Research Practices of Faculty Using the UTAUT Model.” *Computers in Human Behavior* 28(6):2340–50.

Hair, Joe F., Christian M. Ringle, Marko Sarstedt, and G. T. M. Hult. 2017. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Second Edi. Thousand Oakes, CA: SAGE.

Hair, Joe F., Marko Sarstedt, Christian M. Ringle, and Jeannette A. Mena. 2012. “An Assessment of the Use of Partial Least Squares Structural Equation Modeling in Marketing Research.” *Journal of the Academy of Marketing Science* 40(3):414–33.

Hakim, Abraham A., Alec S. Kellish, Umur Atabek, Francis R. Spitz, and Young K. Hong. 2020. “Implications for the Use of Telehealth in Surgical Patients during the COVID-19 Pandemic.” *American Journal of Surgery* 220(1):48–49.

Hamilton, Isobel. 2020. “Zoom Is Being Sued for Sharing Data with Facebook.” *Business Insider*. Retrieved January 10, 2021 (https://www.businessinsider.com/zoom-sued-allegedly-sharing-data-with-facebook-2020-3).

Han, Sehee, Jinyoung Min, and Heeseok Lee. 2015. “Antecedents of Social Presence and Gratification of Social Connection Needs in SNS: A Study of Twitter Users and Their Mobile and Non-Mobile Usage.” *International Journal of Information Management* 35(4):459–71.

Heinonen, Kristina. 2006. “Temporal and Spatial E-Service Value.” *International Journal of Service Industry Management* 17(4):380–400.

Henseler, Jörg, Christian M. Ringle, and Marko Sarstedt. 2015. “A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modeling.” *Journal of the Academy of Marketing Science* 43(1):115–35.

Henseler, Jörg, Christian M. Ringle, and Rudolf R. Sinkovics. 2009. "The Use of Partial Least Squares Path Modeling in International Marketing." *Advances in International Marketing* 20:277–319.

Hew, Jun Jie, Lai Ying Leong, Garry Wei Han Tan, Voon Hsien Lee, and Keng Boon Ooi. 2018. "Mobile Social Tourism Shopping: A Dual-Stage Analysis of a Multi-Mediation Model." *Tourism Management* 66:121–39.

Hong, Weiyin, and James Y. L. Thong. 2013. "Internet Privacy Concerns: An Integrated Conceptualization and Four Empirical Studies." *MIS Quarterly: Management Information Systems* 37(1):275–98.

Huang, Yong Ming. 2017. "Exploring Students' Acceptance of Team Messaging Services: The Roles of Social Presence and Motivation." *British Journal of Educational Technology* 48(4):1047–61.

Jackson, Corey Brian, and Yang Wang. 2018. "Addressing The Privacy Paradox through Personalized Privacy Notifications." *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 2(2):1–25.

Jarvenpaa, Sirkka L., Karl Reiner Lang, Yoko Takeda, and Virpi Kristiina Tuunainen. 2003. "Mobile Commerce at Crossroads." *Communications of the ACM* 46(12):41–44.

Jeff Smith, H., Tamara Dinev, and Heng Xu. 2011. "Information Privacy Research: An Interdisciplinary Review." *MIS Quarterly: Management Information Systems* 35(4):989–1015.

Jimenez, Alfredo, Dirk M. Boehe, Vasyl Taras, and Dan V. Caprar. 2017. "Working Across Boundaries: Current and Future Perspectives on Global Virtual Teams." *Journal of International Management* 23(4):341–49.

Jin, Seung A. Anni. 2012. "'To Disclose or Not to Disclose, That Is the Question': A Structural Equation Modeling Approach to Communication Privacy Management in e-Health." *Computers in Human Behavior* 28(1):69–77.

Johnson, Russell E., Christopher C. Rosen, and Emilija Djurdjevic. 2011. "Assessing the Impact of Common Method Variance on Higher Order Multidimensional Constructs." *Journal of Applied Psychology* 96(4):744–61.

Joinson, Adam N., Ulf Dietrich Reips, Tom Buchanan, and Carina B. Pain. Schofield. 2010. "Privacy, Trust, and Self-Disclosure Online." *Human-Computer Interaction* 25(1):1–24.

Junglas, Iris, and Richard T. Watson. 2006. "The U-Constructs: Four Information Drives." *Communications of the Association for Information Systems* 17(1):569–92.

Kagan, Dima, Galit Fuhrmann Alpert, and Michael Fire. 2020. "Zooming into Video Conferencing Privacy and Security Threats." *Arxiv.Org*.

Ke, Weiling, Hefu Liu, Kwok Kee Wei, Jibao Gu, and Huaping Chen. 2009. "How Do Mediated and Non-Mediated Power Affect Electronic Supply Chain Management System Adoption? The Mediating Effects of Trust and Institutional Pressures." *Decision Support Systems* 46(4):839–51.

Kehr, Flavius, Tobias Kowatsch, Daniel Wentzel, and Elgar Fleisch. 2015. "Blissfully Ignorant: The Effects of General Privacy Concerns, General Institutional Trust, and Affect in the Privacy Calculus." *Information Systems Journal* 25(6):607–35.

Keith, Mark, Jeffry Babb, Christopher Furner, Amjad Abdullat, and Paul Lowry. 2016. "Limited Information and Quick Decisions: Consumer Privacy Calculus for Mobile Applications." *AIS Transactions on Human-Computer Interaction* 8(3):88–130.

Kim, Dongyeon, Kyuhong Park, Yongjin Park, and Jae Hyeon Ahn. 2019. "Willingness to Provide Personal Information: Perspective of Privacy Calculus in IoT Services." *Computers in Human Behavior* 92:273–81.

Kim, Hee Woong, Hock Chuan Chan, and Sumeet Gupta. 2007. "Value-Based Adoption of Mobile Internet: An Empirical Investigation." *Decision Support Systems* 43(1):111–26.

Kim, Sanghyun, and Gary Garrison. 2009. "Investigating Mobile Wireless Technology Adoption: An Extension of the Technology Acceptance Model." *Information Systems Frontiers* 11(3):323–33.

Kirillova, Ksenia, and Dan Wang. 2016. "Smartphone (Dis)Connectedness and Vacation Recovery." *Annals of Tourism Research* 61:157–69.

Kleijnen, Mirella, Ko de Ruyter, and Martin Wetzels. 2007. "An Assessment of Value Creation in Mobile Service Delivery and the Moderating Role of Time Consciousness." *Journal of Retailing* 83(1):33–46.

Koch, Richie. 2020. "Zoom Privacy: Your Video Conferences Aren't as Private as You Think." *Protonmail.Com*. Retrieved January 10, 2021 (https://protonmail.com/blog/zoom-privacy-issues/).

Kokolakis, Spyros. 2017. “Privacy Attitudes and Privacy Behaviour: A Review of Current Research on the Privacy Paradox Phenomenon.” *Computers and Security* 64:122–34.

Kordzadeh, Nima, and John Warren. 2017. “Communicating Personal Health Information in Virtual Health Communities: An Integration of Privacy Calculus Model and Affective Commitment.” *Journal of the Association for Information Systems* 18(1):45–81.

Krasnova, Hanna, Natasha F. Veltri, and Oliver Günther. 2012. “Self-Disclosure and Privacy Calculus on Social Networking Sites: The Role of Culture Intercultural Dynamics of Privacy Calculus.” *Business and Information Systems Engineering* 4(3):127–35.

Kumar, Pankaj, and Preeti Kulkarni. 2020. “Study of Challenges and Strategies Adopted by IT Companies for Internal Customer during COVID-19 Pandemic.” *UGC Care Journal* 31(12):553–70.

Laufer, Robert S., and Maxine Wolfe. 1977. “Privacy as a Concept and a Social Issue: A Multidimensional Developmental Theory.” *Journal of Social Issues* 33(3):22–42.

Lee, Gwanhoo, and Weidong Xia. 2010. “Toward Agile: An Integrated Analysis of Quantitative and Qualitative Field Data on Software Development Agility.” *MIS Quarterly: Management Information Systems* 34(1):87–114.

Li, Charles H., Anandh G. Rajamohan, Patricia T. Acharya, Chia Shang J. Liu, Vishal Patel, John L. Go, Paul E. Kim, and Jay Acharya. 2020. “Virtual Read-Out: Radiology Education for the 21st Century During the COVID-19 Pandemic.” *Academic Radiology* 27(6):872–81.

Li, Han, Rathindra Sarathy, and Heng Xu. 2011. “The Role of Affect and Cognition on Online Consumers’ Decision to Disclose Personal Information to Unfamiliar Online Vendors.” *Decision Support Systems* 51(3):434–45.

Li, He, Jing Wu, Yiwen Gao, and Yao Shi. 2016. “Examining Individuals’ Adoption of Healthcare Wearable Devices: An Empirical Study from Privacy Calculus Perspective.” *International Journal of Medical Informatics* 88:8–17.

Li, Lei, Yide Shen, Guangzhi Zheng, and Rong Guo. 2015. “Which Collaboration Technologies Best Support Student Teamwork? An Empirical Investigation.” in *2015 Americas Conference on Information Systems, AMCIS 2015*.

Lin, Jialiu, Shahriyar Amini, Jason I. Hong, Norman Sadeh, Janne Lindqvist, and Joy Zhang. 2012. “Expectation and Purpose: Understanding Users’ Mental Models of Mobile App Privacy through Crowdsourcing.” Pp. 501–10 in *UbiComp’12 - Proceedings of the 2012 ACM Conference on Ubiquitous Computing*.

Lindell, Michael K., and David J. Whitney. 2001. “Accounting for Common Method Variance in Cross-Sectional Research Designs.” *Journal of Applied Psychology* 86(1):114–21.

Liu, Juhong Christie, and Rob Alexander. 2017. “Factors Affecting Faculty Use of Video Conferencing in Teaching: A Mixed-Method Study.” *Journal of Educational Technology Development and Exchange* 10(2):37–54.

Ltifi, Moez. 2018. “Determinants of the Intention of Smartphone Usage by Mobile Internet Users for M-Services.” *Management Decision* 56(11):2291–2307.

Madrigal, Emilio. 2020. “Going Remote: Maintaining Normalcy in Our Pathology Laboratories during the COVID-19 Pandemic.” *Cancer Cytopathology* 128(5):321–22.

Maican, Catalin Ioan, Ana Maria Cazan, Radu Constantin Lixandroiu, and Lavinia Dovleac. 2019. “A Study on Academic Staff Personality and Technology Acceptance: The Case of Communication and Collaboration Applications.” *Computers and Education* 128:113–31.

Malhotra, Naresh K., Sung S. Kim, and James Agarwal. 2004. “Internet Users’ Information Privacy Concerns (IUIPC): The Construct, the Scale, and a Causal Model.” *Information Systems Research* 15(4):336–55.

Mallat, Niina, Matti Rossi, Virpi Kristiina Tuunainen, and Anssi Öörni. 2008. “An Empirical Investigation of Mobile Ticketing Service Adoption in Public Transportation.” *Personal and Ubiquitous Computing* 12(1):57–65.

McKnight, D. Harrison, Vivek Choudhury, and Charles Kacmar. 2002. “Developing and Validating Trust Measures for E-Commerce: An Integrative Typology.” *Information Systems Research* 13(3):334–59.

Mihalcik, Carrie. 2020. “Microsoft Listened to Skype Calls with ‘no Security’ to Protect Recordings, Report Says.” *Cnet*. Retrieved January 10, 2021 (https://www.cnet.com/news/microsoft-listened-to-skype-calls-with-no-security-to-protect-recordings-report-says/).

Mirzamohammadi, Saeed, and Ardalan Amiri Sani. 2016. “Viola: Trustworthy Sensor Notifications for Enhanced Privacy on Mobile Systems.” Pp. 262–75 in *MobiSys 2016 - Proceedings of the 14th Annual International Conference on Mobile Systems, Applications, and Services*.

Morosan, Cristian, and Agnes DeFranco. 2015. “Disclosing Personal Information via Hotel Apps: A Privacy Calculus Perspective.” *International*

Journal of Hospitality Management 47:120–30.

Neustaedter, Carman, Brennan Jones, Kenton O'Hara, and Abigail Sellen. 2018. "The Benefits and Challenges of Video Calling for Emergency Situations." in *Conference on Human Factors in Computing Systems - Proceedings*. Vols. 2018-April.

Neustaedter, Carman, Carolyn Pang, Azadeh Forghani, Erick Oduor, Serena Hillman, Tejinder K. Judge, Michael Massimi, and Saul Greenberg. 2015. "Sharing Domestic Life through Long-Term Video Connections." *ACM Transactions on Computer-Human Interaction* 22(1):3.

O'Hara, Kenton, Alison Black, and Matthew Lipson. 2009. "Media Spaces and Mobile Video Telephony." Pp. 303–23 in *Media Spaces and Mobile Video Telephony*.

Ogara, Solomon O., Chang E. Koh, and Victor R. Prybutok. 2014. "Investigating Factors Affecting Social Presence and User Satisfaction with Mobile Instant Messaging." *Computers in Human Behavior* 36:453–59.

Okazaki, Shintaro, Hairong Li, and Morikazu Hirose. 2009. "Consumer Privacy Concerns and Preference for Degree of Regulatory Control: A Study of Mobile Advertising in Japan." *Journal of Advertising* 38(4):63–77.

Okazaki, Shintaro, and Felipe Mendez. 2013. "Perceived Ubiquity in Mobile Services." *Journal of Interactive Marketing* 27(2):98–111.

Okazaki, Shintaro, Francisco José Molina, and Morikazu Hirose. 2012. "Mobile Advertising Avoidance: Exploring the Role of Ubiquity." *Electronic Markets* 22(3):169–83.

Oliveira, Tiago, Matilde Alhinho, Paulo Rita, and Gurpreet Dhillon. 2017. "Modelling and Testing Consumer Trust Dimensions in E-Commerce." *Computers in Human Behavior* 71:153–64.

Oregon, Evie, Lauren McCoy, and Lacee Carmon-Johnson. 2018. "Case Analysis: Exploring the Application of Using Rich Media Technologies and Social Presence to Decrease Attrition in an Online Graduate Program." *Journal of Educators Online* 15(2).

Ozturk, Ahmet Bulent, Khaldoon Nusair, Fevzi Okumus, and Dipendra Singh. 2017. "Understanding Mobile Hotel Booking Loyalty: An Integration of Privacy Calculus Theory and Trust-Risk Framework." *Information Systems Frontiers* 19(4):753–67.

Padilla-Meléndez, Antonio, Aurora Garrido-Moreno, and Ana Rosa Del Aguila-Obra. 2008. "Factors Affecting E-Collaboration Technology Use among Management Students." *Computers and Education* 51(2):609–23.

Park, Eun Kyung, and S. Shyam Sundar. 2015. "Can Synchronicity and Visual Modality Enhance Social Presence in Mobile Messaging?" *Computers in Human Behavior* 45:121–28.

Pavlou, Paul A., and Mendel Fygenson. 2006. "Understanding and Predicting Electronic Commerce Adoption: An Extension of the Theory of Planned Behavior." *MIS Quarterly: Management Information Systems* 30(1):115–43.

Pentina, Iryna, Lixuan Zhang, Hatem Bata, and Ying Chen. 2016. "Exploring Privacy Paradox in Information-Sensitive Mobile App Adoption: A Cross-Cultural Comparison." *Computers in Human Behavior* 65:409–19.

Petronio, Sandra. 2010. "Communication Privacy Management Theory: What Do We Know About Family Privacy Regulation?" *Journal of Family Theory & Review* 2(3):175–96.

Pillet, Jean Charles, and Kevin Daniel André Carillo. 2016. "Email-Free Collaboration: An Exploratory Study on the Formation of New Work Habits among Knowledge Workers." *International Journal of Information Management* 36(1):113–25.

Pinsonneault, Alain, and Kenneth L. Kraemer. 1993. "Survey Research Methodology in Management Information Systems: An Assessment." *Journal of Management Information Systems* 10(2):75–105.

Plangger, Kirk, and Matteo Montecchi. 2020. "Thinking Beyond Privacy Calculus: Investigating Reactions to Customer Surveillance." *Journal of Interactive Marketing* 50:32–44.

Podsakoff, Philip M., Scott B. MacKenzie, Jeong Yeon Lee, and Nathan P. Podsakoff. 2003. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies." *Journal of Applied Psychology* 88(5):879–903.

Pontz, Benjamin. 2020. "From Conference Calls to Zoom, Local Governments Employ Range of Approaches to Public Meetings during Pandemic." *Witf.Org*. Retrieved January 10, 2021 (https://www.witf.org/2020/05/07/from-conference-calls-to-zoom-local-governments-employ-range-of-approaches-to-public-meetings-during-pandemic/).

Raigani, Siavash, Alp Numanoglu, Marc Schwachter, and Todd A. Ponsky. 2014. "Online Resources in Pediatric Surgery: The New Era of Medical Information." *European Journal of Pediatric Surgery* 24(4):308–12.

Reuters. 2020. “Zoom Pulls in More than 200 Million Daily Video Users during Worldwide Lockdowns.” *Reuters* 2–7. Retrieved January 10, 2021 (https://www.reuters.com/article/us-health-coronavirus-zoom/zoom-pulls-in-more-than-200-million-daily-video-users-during-worldwide-lockdowns-idUSKBN21K1C7).

Reynolds, P. A., K. A. Eaton, and R. Mason. 2008. “Seeing Is Believing: Dental Education Benefits from Developments in Videoconferencing.” *British Dental Journal* 204(2):87–92.

Ringle, Christian M., Marko Sarstedt, and Detmar W. Straub. 2012. “A Critical Look at the Use of PLS-SEM in MIS Quarterly.” *MIS Quarterly: Management Information Systems* 36(1):3–14.

Rogers, P., and M. Lea. 2005. “Social Presence in Distributed Group Environments: The Role of Social Identity.” *Behaviour and Information Technology* 24(2):151–58.

Rohm, Andrew J., and George R. Milne. 2004. “Just What the Doctor Ordered. The Role of Information Sensitivity and Trust in Reducing Medical Information Privacy Concern.” *Journal of Business Research* 57(9):1000–1011.

Roy, Subhadip, and Y. L. R. Moorthi. 2017. “Technology Readiness, Perceived Ubiquity and M-Commerce Adoption: The Moderating Role of Privacy.” *Journal of Research in Interactive Marketing* 11(3):268–95.

Russell, Aspen, and Eitan Frachtenberg. 2020. “After the Pandemic: Tech, Work, and the Tech Workforce.” *Techrxiv.Org*. Retrieved January 10, 2021 (https://www.techrxiv.org/articles/preprint/After_the_Pandemic_Tech_Work_and_the_Tech_Workforce/13278092/files/25568669.pdf).

Ryans, Adrian B. 1974. “Estimating Consumer Preferences for a New Durable Brand in an Established Product Class.” *Journal of Marketing Research* 11(4):434.

Sarwar, Binesh, Salman Zulfiqar, Saira Aziz, and Khurram Ejaz Chandia. 2019. “Usage of Social Media Tools for Collaborative Learning: The Effect on Learning Success With the Moderating Role of Cyberbullying.” *Journal of Educational Computing Research* 57(1):246–79.

Setterstrom, Andrew J., J. Michael Pearson, and Robert A. Orwig. 2013. “Web-Enabled Wireless Technology: An Exploratory Study of Adoption and Continued Use Intentions.” *Behaviour and Information Technology* 32(11):1139–54.

Shaw, Norman, and Ksenia Sergueeva. 2019. “The Non-Monetary Benefits of Mobile Commerce: Extending UTAUT2 with Perceived Value.” *International Journal of Information Management* 45:44–55.

Shin, Dong Hee. 2010. “The Effects of Trust, Security and Privacy in Social Networking: A Security-Based Approach to Understand the Pattern of Adoption.” *Interacting with Computers* 22(5):428–38.

Short, John, Ederyn Williams, and Bruce Christie. 1976. *The Social Psychology of Telecommunications*. Vol. 7. London: Wiley.

Silic, Mario, Andrea Back, and Thomas Sammer. 2017. “Employee Acceptance and Use of Unified Communications and Collaboration in a Cross-Cultural Environment.” Pp. 1–22 in *Remote Work and Collaboration: Breakthroughs in Research and Practice*. Vols. 1–2.

Slyke, Craig, J. T. Shim, Richard Johnson, and James Jiang. 2006. “Concern for Information Privacy and Online Consumer Purchasing.” *Journal of the Association for Information Systems* 7(6):415–44.

Smith, H. Jeff, Sandra J. Milberg, and Sandra J. Burke. 1996. “Information Privacy: Measuring Individuals’ Concerns about Organizational Practices.” *MIS Quarterly: Management Information Systems* 20(2):167–95.

Solove, Daniel J. 2006. “A Taxonomy of Privacy.” *University of Pennsylvania Law Review* 154(3):477–564.

Song, Ji Hee, and Candice R. Hollenbeck. 2015. “The Value of Social Presence in Mobile Communications.” *Service Industries Journal* 35(11–12):611–32.

Stein, Mari Klara, Sue Newell, Erica L. Wagner, and Robert D. Galliers. 2015. “Coping with Information Technology: Mixed Emotions, Vacillation, and Nonconforming Use Patterns.” *MIS Quarterly: Management Information Systems* 39(2):367–92.

Stewart, Kathy A., and Albert H. Segars. 2002. “An Empirical Examination of the Concern for Information Privacy Instrument.” *Information Systems Research* 13(1):36–49.

Straub, Detmar, and Elena Karahanna. 1998. “Knowledge Worker Communications and Recipient Availability: Toward a Task Closure Explanation of Media Choice.” *Organization Science* 9(2):160–75.

Straub, Detmar W. 1989. “Validating Instruments in MIS Research.” *MIS Quarterly: Management Information Systems* 13(2):147–65.

Teo, Hock Hai, K. K. Wei, and I. Benbasat. 2003. "Predicting Intention to Adopt Interorganizational Linkages: An Institutional Perspective." *MIS Quarterly: Management Information Systems* 27(1):19–49.

Tojib, Dewi, and Yelena Tsarenko. 2012. "Post-Adoption Modeling of Advanced Mobile Service Use." *Journal of Business Research* 65(7):922–28.

Venkatesh, M. Vijay, Jian Zhao, Larry Profitt, and Sen Ching S. Cheung. 2009. "Audio-Visual Privacy Protection for Video Conference." Pp. 1574–75 in *Proceedings - 2009 IEEE International Conference on Multimedia and Expo, ICME 2009*.

Venkatesh, Viswanath, Michael G. Morris, Gordon B. Davis, and Fred D. Davis. 2003. "User Acceptance of Information Technology: Toward a Unified View." *MIS Quarterly: Management Information Systems* 27(3):425–78.

Venkatesh, Viswanath, James Y. L. Thong, Frank K. Y. Chan, Paul Jen Hwa Hu, and Susan A. Brown. 2011. "Extending the Two-Stage Information Systems Continuance Model: Incorporating UTAUT Predictors and the Role of Context." *Information Systems Journal* 21(6):527–55.

Walter, Nicolai, Kevin Ortbach, and Bjoern Niehaves. 2015. "Designing Electronic Feedback - Analyzing the Effects of Social Presence on Perceived Feedback Usefulness." *International Journal of Human Computer Studies* 76:1–11.

Wang, Changlin, Thompson S. H. Teo, and Luning Liu. 2020. "Perceived Value and Continuance Intention in Mobile Government Service in China." *Telematics and Informatics* 48.

Wang, Paul, and Lisa A. Petrison. 1993. "Direct Marketing Activities and Personal Privacy.A Consumer Survey." *Journal of Direct Marketing* 7(1):7–19.

Wang, Tien, Trong Danh Duong, and Charlie C. Chen. 2016. "Intention to Disclose Personal Information via Mobile Applications: A Privacy Calculus Perspective." *International Journal of Information Management* 36(4):531–42.

Watson, Richard T., Leyland F. Pitt, Pierre Berthon, and George M. Zinkhan. 2002. "U-Commerce: Expanding the Universe of Marketing." *Journal of the Academy of Marketing Science* 30(4):333–47.

Wiegard, Rouven B., and Michael H. Breitner. 2019. "Smart Services in Healthcare: A Risk-Benefit-Analysis of Pay-as-You-Live Services from Customer Perspective in Germany." *Electronic Markets* 29(1):107–23.

Wilson, David W., and Joseph S. Valacich. 2012. "Unpacking the Privacy Paradox: Irrational Decision-Making within the Privacy Calculus." Pp. 4152–62 in *International Conference on Information Systems, ICIS 2012*. Vol. 5.

Wu, Kewen, Julita Vassileva, Zeinab Noorian, and Yuxiang Zhao. 2015. "How Do You Feel When You See a List of Prices? The Interplay among Price Dispersion, Perceived Risk and Initial Trust in Chinese C2C Market." *Journal of Retailing and Consumer Services* 25:36–46.

Wu, Kewen, Julita Vassileva, Yuxiang Zhao, Qinghua Zhu, and Jie Fang. 2014. "The Influence of Price Dispersion on Purchase Intention in Chinese Online C2C Market: A Trust Perspective." in *Proceedings - Pacific Asia Conference on Information Systems, PACIS 2014*.

Xu, Heng, Tamara Dinev, H. J. Smith, and Paul Hart. 2008. "Examining the Formation of Individual's Privacy Concerns: Toward an Integrative View." Pp. 1–16 in *International Conference on Information Systems (ICIS) 2008 Proceedings*.

Xu, Heng, Sumeet Gupta, Mary Beth Rosson, and John M. Carroll. 2012. "Measuring Mobile Users' Concerns for Information Privacy." in *Thirty Third International Conference on Information Systems (ICIS). Association for Information Systems, Orlando, FL.*

Xu, Heng, Xin Luo, John M. Carroll, and Mary Beth Rosson. 2011. "The Personalization Privacy Paradox: An Exploratory Study of Decision Making Process for Location-Aware Marketing." *Decision Support Systems* 51(1):42–52.

Xu, Heng, Hock Hai Teo, Bernard C. Y. Tan, and Ritu Agarwal. 2009. "The Role of Push-Pull Technology in Privacy Calculus: The Case of Location-Based Services." *Journal of Management Information Systems* 26(3):135–74.

Ye, Shun, Sut Ieng Lei, Haili Shen, and Honggen Xiao. 2020. "Social Presence, Telepresence and Customers' Intention to Purchase Online Peer-to-Peer Accommodation: A Mediating Model." *Journal of Hospitality and Tourism Management* 42:119–29.

Yoo, Youngjin, and Maryam Alavi. 2001. "Media and Group Cohesion: Relative Influences on Social Presence, Task Participation, and Group Consensus." *MIS Quarterly: Management Information Systems* 25(3):371–90.

Yuan, Shupei, Syed A. Hussain, Kayla D. Hales, and Shelia R. Cotten. 2016. "What Do They like? Communication Preferences and Patterns of Older Adults in the United States: The Role of Technology." *Educational Gerontology* 42(3):163–74.

Yun, Haejung, Choong C. Lee, Byung Geun Kim, and William J. Kettinger. 2011. "What Determines Actual Use of Mobile Web Browsing Services? A Contextual Study in Korea." *Communications of the Association for Information Systems* 28(1):313–28.

Yun, Younghwa, and Jieun Sung. 2010. “Toward a More Robust Usability Concept with Perceived Enjoyment in the Context of Mobile Multimedia Service.” *International Journal of Human Computer Interaction* (1):12.

Zeithaml, Valarie A. 1988. “Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence.” *Journal of Marketing* 52(3):2–22.

Zhang, Kai, Wei Li Liu, Craig Locatis, and Michael Ackerman. 2016. “Mobile Videoconferencing Apps for Telemedicine.” *Telemedicine and E-Health* 22(1):56–62.

Zhao, Ling, Yaobin Lu, and Sumeet Gupta. 2012. “Disclosure Intention of Location-Related Information in Location-Based Social Network Services.” Pp. 53–90 in *International Journal of Electronic Commerce*. Vol. 16.

Zhou, Tao. 2011. “The Impact of Privacy Concern on User Adoption of Location-Based Services.” *Industrial Management and Data Systems* 111(2):212–26.

Zhou, Tao. 2012. “Examining Mobile Banking User Adoption from the Perspectives of Trust and Flow Experience.” *Information Technology and Management* 13(1):27–37.

9. APPENDIX

Table 1. Summary of the Studies on Video Conferencing (VC) apps.

Study	Collaboration technologies including Videoconferencing	Adoption Theory	Independent variable	Dependent variable	Methods	Data and Context
(Brown et al. 2010)	Collaboration technology usage such as SMS and in-house collaboration technologies such as: telephone, proprietary videoconferencing and audio conferencing, and desktop messaging	UTAUT, Social presence, Channel Expansion theory, task closure model.	Social presence, immediacy, concurrency, technology experience, self-efficacy, familiarity with others, peer influence, superior influence, resource facilitating conditions, technology facilitating conditions, performance expectancy, effort expectancy, social influence, facilitating conditions	Intentions to use, use.	Partial least squares (PLS)	Paper based survey of 349 students in a Finland university for study 1 Email based survey of 830 participants in a Fortune 500 technology company in Finland for study 2.
(Gruzd et al. 2012)	Social media tools including Skype; Flickr; Twitter; Facebook and academia.edu	TAM, UTAUT.	Most popular social media tools Reasons to use social media. Perceived utility of social media for scholarly practices. Perceived challenges associated with social media practices.	Examine the role of social media in research practices of faculty.		51 attendees of American society of information science and technology (ASIS&T)2010 conference. Semi-structured qualitative interview.
(Li et al. 2015)	Collaboration technologies suitable for student team project	TTF.	- Usage of collaboration technologies and participants attitudes. - Assess important features of collaboration technology (document and content sharing, team communication, cost of collaboration technology, task management).	Identify and promote appropriate collaboration technologies to best suit students' collaborative needs.	The scale of perceived importance in raking of important features of collaboration technology.	Web-based survey of 111 students majoring in information technology attending online and traditional on-campus classes.

(Pillet and Carillo 2016)	Conferencing system and whiteboard (CSW), blogs, microblogs, wikis, social networking sites, wikis, and video-content sharing sites.	-	Relative advantage, compatibility, ease of use, habit.	Knowledge sharing.	Structural equation modelling (SEM). Partial least square (PLS).	Survey of 66 employees in an International information technology services company.
(Liu and Alexander 2017)	Blackboard collaborate, Zoom.us, Google hangout, CISCO Webex.	-	Perceptions of importance of Videoconferencing features. Perceived importance of VC systems 's quality integration in the faculty's pedagogical practice.	Factors affecting use and non-use of videoconferencing in the teaching.	Thematic analysis for coding qualitative data, Cross tabulation, Logistic regression, standard multiple regression.	Researchers' observation of 6 faculty members representing six different disciplines using VC systems, Participants' ranking of the perceptions of VC systems and additional comments. Email survey of 88 faculty in different universities.
(Sarwar et al. 2019)	Facebook, WhatsApp, LinkedIn, and WeChat.	TAM and Constructivism Theory about collaborative learning	Perceived usefulness, Perceived ease of use, Perceived enjoyment, and cyber-bullying.	Social media use, collaborative learning, and learner performance.	SEM.	Survey of 360 full time students enrolled in undergraduate and graduate level disciplines through email and WeChat.

(Maican et al. 2019)	Online collaboration applications including Google Docs, ZohoWriter, Office 365, PBWorks, Dropbox, Facebook, Twitter, Slack, Mattermost, HipChat, grove, Google Hangouts, Skype, Appear.in, Moodle, ATutor, Mural, IdeaFlip, MindMeister, Nuclio, XWiki, Evernote, Google Keep e, Yammer, Podio, eXo Platform, Asana, Trello, Basecamp, Samepage, LinkedIn, HR.com, ResearchGate, Academia.edu, Mendeley.	UTAUT2	Performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, customer value, habit, technology anxiety, self-efficacy.	Behavioral intentions, use behavior.	Average score, Confirmatory factor analysis using partial least squares (PLS).	Survey of 1816 university teachers from thirteen Romanian universities through email.

Table 2. Survey questionnaire

Constructs	Authors
Perceived Surveillance	
PS1. I believe that the location of my video conferencing apps is monitored at least part of the time.	Xu et al. 2012 (Dropped)
PS2. I am concerned that video conferencing apps are collecting too much information about me.	Belanger and Crossler, 2019; Xu et al. ,2012
PS3. I am concerned that video conferencing apps may monitor my activities on my mobile device.	
Perceived Intrusion	
PI1. I feel that as a result of my using video conferencing apps, others know about me more than I am comfortable with.	
PI2. I believe that as a result of my using video conferencing apps, information about me that I consider private is now more readily available to others than I would want.	
PI3. I feel that as a result of my using video conferencing apps, information about me is out there that, if used, will invade my privacy.	
Secondary Use of Personal Information	Belanger & Crossler, 2019
SU1. I am concerned that video conferencing apps may use my personal information for other purposes without notifying me or getting my authorization.	
SU2. When I give personal information to use video conferencing apps, I am concerned that apps may use my information for other purposes.	
SU3. I am concerned that video conferencing apps may share my personal information with other entities without getting my authorization.	
Time Savings	Okazaki et al., 2012
TS1. Using video conferencing apps is an effective way to manage my time.	
TS2. Using video conferencing apps makes my life easier.	
TS3. Using video conferencing apps fits my schedule.	
TS4. Using video conferencing apps enables flexibility in my schedule.	Self-Developed
Spatial Flexibility	Okazaki et al., 2012
SF1. Using video conferencing apps enables me to find information at any place.	
SF2. Using video conferencing apps gives me the ability to overcome the spatial limitation.	
SF3. Using video conferencing apps fits any location, wherever I go.	
SF4. Using video conferencing apps enables me to interact with peers at any place.	
Portability	Okazaki & Mendez, 2013
P1. Video conferencing apps are practical because I can use them without difficulty wherever I am.	
P2. Using video conferencing apps outside my home or my workplace is not a problem for me.	
P3. I find it convenient to use video conferencing apps because they don't make me dependent	

on any fixed installation.	
Immediacy	Brown et al., 2010
I1. Video conferencing apps enable me to quickly reach my peers.	
I2. When I communicate with peers using video conferencing apps, they usually respond quickly.	
I3. When my peers communicate with me using video conferencing apps, I try to respond immediately.	
I4. The use of video conferencing apps to communicate with peers provides a chance for social interaction.	Self-Developed
Continuity	Okazaki & Mendez, 2013
C1. Using video conferencing apps keeps me well informed at all times.	
C2. With video conferencing apps, I can always keep up with my peers.	
C3. When I use video conferencing apps, I don't have to interrupt my current task.	(Dropped)
Trust	Oliveira et al., 2017
T1. I like to trust video conferencing apps.	
T2. I find video conferencing apps trustworthy.	
T3. I like the reliability of video conferencing apps.	
T4. I value the trustworthy characteristics of video conferencing apps.	
Perceived Risks	Malhotra et al., 2004
PR1. It would be risky to share information using video conferencing apps.	
PR2. There would be a high potential for loss associated with sharing information using video conferencing apps.	
PR3. There would be too much uncertainty associated with sharing information using video conferencing apps.	
PR4. Sharing information using video conferencing apps would involve many unexpected problems.	
Perceived Benefits	D. Kim et al., 2019
PB1. Using video conferencing apps improves my performance.	
PB2. Using video conferencing apps enhances my effectiveness.	
PB3. Using video conferencing apps enables me to accomplish my tasks more quickly.	
PB4. Using video conferencing apps is very useful for me.	
Social Presence	Choi, 2016
SP1. The interaction with my peers is personal.	
SP2. The interaction with my peers is warm.	
SP3. The interaction with my peers is close.	
SP4. The interaction with my peers is humanizing.	
Perceived Value	Kim et al. 2007
PV1. Compared to the fee value I need to pay, the use of video conferencing apps offers value for money.	
PV2. Compared to the effort I need to put in, the use of video conferencing apps is beneficial to me.	
PV3. Compared to the time I need to spend, the use of video conferencing apps is worthwhile to me.	

PV4. Overall, the use of video conferencing apps delivers me good value.	
Technicality	Kim et al. 2007
Te1. It is easy to use video conferencing apps.	
Te2. Video conferencing apps can be connected instantly.	
Te3. Video conferencing apps take a short time to respond.	
Te4. It is easy to get video conferencing apps to do what I want them to do.	
Continuance Intentions	Venkatesh et al., 2011
CI1. I intend to continue using video conferencing apps.	
CI2. I plan to continue using video conferencing apps.	
CI3. I will continue using video conferencing apps.	

Table 3. Demographic characteristics

Sample (n=487).

Gender	n	%
Female	147	30%
Male	337	69%
Prefer not to answer	3	1%
Age		
0 - 17	0	0%
18 – 24	38	8%
25 – 34	204	42%
35 – 44	168	34%
45 – 54	74	15%
55 – 64	0	0%
65 – 74	1	0%
> 74	0	0%
Missing	2	0%

Table 4. Descriptive statistics, correlation, composite reliability (CR), and average variance extracted (AVE).

	Mean	SD	CR	PS	PI	SU	TS	SF	Po	Im	Co	Tr	PR	PB	SP	PV	Te	CI
PS	4.286	1.706	0.945	**0.947**														
PI	3.886	1.621	0.943	0.774	**0.920**													
SU	4.495	1.730	0.959	0.709	0.707	**0.942**												
TS	5.335	1.254	0.928	-0.030	-0.073	-0.040	**0.873**											
SF	5.286	1.143	0.875	0.033	0.009	-0.026	0.636	**0.798**										
Po	5.736	1.143	0.879	-0.055	-0.076	-0.094	0.528	0.605	**0.841**									
Im	5.409	1.104	0.881	0.046	-0.001	-0.009	0.537	0.561	0.455	**0.807**								
Co	5.018	1.292	0.877	0.011	-0.036	0.028	0.438	0.434	0.361	0.519	**0.884**							
Tr	4.590	1.176	0.926	-0.356	-0.311	-0.359	0.339	0.338	0.295	0.321	0.322	**0.870**						
PR	4.141	1.320	0.937	0.497	0.497	0.569	-0.037	0.030	-0.089	0.024	0.005	-0.370	**0.888**					
PB	5.222	1.196	0.939	-0.028	-0.041	-0.006	0.692	0.593	0.420	0.541	0.424	0.354	-0.017	**0.891**				
SP	4.409	1.358	0.940	-0.065	-0.095	-0.076	0.340	0.378	0.205	0.428	0.340	0.371	-0.055	0.421	**0.892**			
PV	5.432	1.112	0.936	-0.114	-0.126	-0.096	0.518	0.475	0.347	0.452	0.376	0.357	-0.128	0.607	0.352	**0.886**		
Te	5.689	0.991	0.918	-0.052	-0.100	-0.077	0.382	0.412	0.467	0.419	0.292	0.301	-0.094	0.400	0.237	0.405	**0.859**	
CI	6.201	1.095	0.976	-0.056	-0.107	-0.066	0.393	0.356	0.340	0.370	0.263	0.273	-0.111	0.441	0.206	0.523	0.438	**0.965**

Note: Standard Deviation (SD); composite reliability (CR); values in diagonal (bold) are square root of AVE.

Table 5. Loadings and cross loadings.

Construct	Item	PS	PI	SU	TS	SF	Po	Im	Co	Tr	PR	PB	SP	PV	Te	CI
PS	PS2	**0.947**	0.734	0.675	-0.042	0.015	-0.084	0.017	0.000	-0.336	0.466	-0.032	-0.055	-0.117	-0.058	-0.067
	PS3	**0.946**	0.732	0.666	-0.015	0.047	-0.019	0.071	0.020	-0.338	0.474	-0.021	-0.068	-0.098	-0.041	-0.038
	PI1	0.730	**0.905**	0.628	-0.080	-0.002	-0.090	-0.017	-0.033	-0.252	0.435	-0.032	-0.088	-0.142	-0.075	-0.090
PI	PI2	0.704	**0.931**	0.638	-0.082	0.010	-0.060	0.002	-0.014	-0.294	0.459	-0.056	-0.094	-0.114	-0.097	-0.099
	PI3	0.705	**0.925**	0.685	-0.040	0.018	-0.060	0.012	-0.052	-0.312	0.477	-0.024	-0.081	-0.091	-0.105	-0.106
	SU1	0.669	0.689	**0.937**	-0.046	-0.031	-0.090	-0.001	0.016	-0.350	0.542	-0.028	-0.081	-0.101	-0.059	-0.077
SU	SU2	0.679	0.663	**0.953**	-0.024	-0.031	-0.094	-0.014	0.015	-0.336	0.531	-0.005	-0.098	-0.106	-0.080	-0.055
	SU3	0.654	0.645	**0.936**	-0.042	-0.012	-0.083	-0.009	0.048	-0.329	0.535	0.016	-0.037	-0.063	-0.079	-0.053
	TS1	0.000	-0.028	0.000	**0.876**	0.530	0.480	0.461	0.391	0.273	-0.007	0.587	0.265	0.410	0.297	0.270
TS	TS2	-0.054	-0.097	-0.053	**0.899**	0.560	0.447	0.483	0.408	0.347	-0.050	0.662	0.326	0.518	0.336	0.393
	TS3	-0.048	-0.088	-0.060	**0.868**	0.564	0.517	0.499	0.358	0.307	-0.054	0.568	0.272	0.440	0.384	0.387
	TS4	0.000	-0.040	-0.024	**0.849**	0.569	0.397	0.431	0.372	0.256	-0.018	0.599	0.325	0.442	0.314	0.318
	SF1	0.095	0.092	0.026	0.519	**0.730**	0.363	0.415	0.351	0.260	0.107	0.445	0.284	0.259	0.246	0.169
SF	SF2	0.043	0.027	-0.032	0.549	**0.796**	0.392	0.490	0.344	0.289	0.021	0.487	0.317	0.461	0.275	0.356
	SF3	-0.021	-0.022	-0.026	0.462	**0.810**	0.615	0.384	0.313	0.280	-0.027	0.458	0.262	0.355	0.344	0.264
	SF4	-0.006	-0.057	-0.047	0.503	**0.850**	0.552	0.497	0.376	0.251	0.001	0.499	0.338	0.429	0.437	0.335
	P1	0.007	-0.031	-0.021	0.513	0.563	**0.875**	0.472	0.346	0.285	-0.049	0.413	0.185	0.325	0.482	0.308
Po	P2	-0.087	-0.073	-0.131	0.352	0.453	**0.808**	0.253	0.225	0.198	-0.092	0.251	0.136	0.206	0.327	0.193
	P3	-0.072	-0.093	-0.103	0.447	0.500	**0.839**	0.394	0.324	0.250	-0.090	0.374	0.191	0.327	0.352	0.342
	I1	0.020	0.003	0.022	0.470	0.473	0.418	**0.821**	0.481	0.250	0.038	0.465	0.319	0.397	0.368	0.323
Im	I2	0.053	0.008	-0.014	0.474	0.489	0.355	**0.878**	0.441	0.296	0.012	0.454	0.325	0.391	0.336	0.307
	I3	0.099	0.029	0.035	0.403	0.450	0.382	**0.853**	0.394	0.213	0.060	0.381	0.241	0.316	0.340	0.312
	I4	-0.034	-0.052	-0.083	0.378	0.392	0.310	**0.658**	0.349	0.281	-0.042	0.449	0.530	0.357	0.305	0.247
	C1	0.063	0.024	0.051	0.360	0.346	0.264	0.392	**0.862**	0.301	0.026	0.344	0.272	0.289	0.222	0.187
Co	C2	-0.036	-0.079	0.002	0.411	0.416	0.367	0.517	**0.905**	0.272	-0.014	0.402	0.325	0.369	0.289	0.271
	T1	-0.299	-0.246	-0.291	0.247	0.287	0.243	0.270	0.243	**0.855**	-0.274	0.301	0.327	0.311	0.255	0.250
Tr	T2	-0.400	-0.342	-0.423	0.278	0.260	0.224	0.248	0.284	**0.909**	-0.435	0.275	0.320	0.327	0.242	0.226
	T3	-0.255	-0.232	-0.273	0.331	0.330	0.299	0.309	0.323	**0.869**	-0.302	0.336	0.312	0.333	0.315	0.253
	T4	-0.267	-0.250	-0.238	0.330	0.311	0.269	0.299	0.270	**0.846**	-0.249	0.332	0.339	0.269	0.238	0.226
	PR1	0.461	0.428	0.503	-0.022	0.052	-0.061	0.052	0.025	-0.314	**0.882**	0.019	-0.028	-0.093	-0.058	-0.078
PR	PR2	0.467	0.472	0.519	-0.018	0.049	-0.072	0.027	-0.018	-0.326	**0.916**	-0.024	-0.072	-0.114	-0.064	-0.086
	PR3	0.460	0.457	0.541	-0.049	0.045	-0.053	0.027	0.012	-0.351	**0.909**	-0.016	-0.038	-0.120	-0.074	-0.098
	PR4	0.368	0.404	0.454	-0.044	-0.047	-0.137	-0.025	-0.002	-0.321	**0.842**	-0.043	-0.058	-0.130	-0.144	-0.138
	PB1	0.000	-0.015	0.011	0.594	0.512	0.362	0.456	0.351	0.297	0.015	**0.914**	0.380	0.489	0.338	0.334
PB	PB2	0.005	-0.015	0.017	0.624	0.521	0.372	0.491	0.374	0.301	0.017	**0.923**	0.408	0.515	0.344	0.359
	PB3	-0.016	-0.028	0.001	0.633	0.544	0.328	0.501	0.370	0.279	0.034	**0.888**	0.367	0.493	0.284	0.340
	PB4	-0.081	-0.081	-0.047	0.608	0.529	0.424	0.474	0.409	0.375	-0.116	**0.835**	0.342	0.646	0.443	0.519
	SP1	-0.052	-0.083	-0.051	0.350	0.363	0.201	0.402	0.328	0.350	-0.032	0.407	**0.867**	0.329	0.235	0.149
SP	SP2	-0.065	-0.096	-0.072	0.293	0.348	0.197	0.381	0.311	0.324	-0.037	0.381	**0.921**	0.351	0.206	0.201
	SP3	-0.059	-0.078	-0.084	0.305	0.353	0.193	0.394	0.333	0.363	-0.058	0.381	**0.924**	0.287	0.210	0.193
	SP4	-0.055	-0.083	-0.068	0.255	0.273	0.134	0.343	0.228	0.280	-0.074	0.324	**0.855**	0.287	0.190	0.196
	PV1	-0.079	-0.060	-0.083	0.340	0.375	0.257	0.316	0.307	0.271	-0.062	0.400	0.211	**0.754**	0.255	0.322
PV	PV2	-0.100	-0.133	-0.101	0.483	0.423	0.304	0.410	0.347	0.318	-0.133	0.570	0.304	**0.934**	0.360	0.486
	PV3	-0.095	-0.110	-0.047	0.515	0.447	0.309	0.439	0.351	0.302	-0.092	0.591	0.358	**0.925**	0.355	0.503

	PV4	-0.125	-0.129	-0.111	0.474	0.437	0.351	0.425	0.330	0.372	-0.155	0.564	0.353	**0.918**	0.444	0.513
	Te1	0.446	0.271	0.352	0.343	-0.085	-0.072	-0.025	0.389	0.414	0.335	0.146	-0.031	0.316	**0.871**	0.220
	Te2	0.358	0.265	0.353	0.357	-0.114	-0.076	-0.078	0.351	0.403	0.373	0.236	-0.075	0.358	**0.887**	0.287
Te	Te3	0.325	0.206	0.373	0.332	-0.064	-0.082	-0.038	0.310	0.392	0.376	0.236	-0.074	0.323	**0.832**	0.264
	Te4	0.354	0.252	0.365	0.342	-0.081	-0.096	-0.042	0.330	0.395	0.339	0.214	-0.095	0.319	**0.846**	0.274
	Cl1	-0.041	-0.089	-0.048	0.394	0.357	0.340	0.379	0.273	0.267	-0.081	0.430	0.212	0.489	0.408	**0.956**
Cl	Cl2	-0.048	-0.094	-0.064	0.363	0.327	0.313	0.341	0.222	0.249	-0.104	0.419	0.186	0.502	0.442	**0.967**
	Cl3	-0.073	-0.125	-0.078	0.381	0.348	0.333	0.354	0.266	0.274	-0.136	0.429	0.199	0.525	0.418	**0.972**

Table 6 - Heterotrait-Monotrait Ratio (HTMT).

Construct	PS	PI	SU	TS	SF	Po	Im	Co	Tr	PR	PB	SP	PV	Te	CI
PS															
PI	0.864														
SU	0.779	0.765													
TS	0.041	0.080	0.048												
SF	0.067	0.072	0.047	0.750											
Po	0.087	0.092	0.117	0.615	0.747										
Im	0.076	0.043	0.056	0.627	0.690	0.551									
Co	0.070	0.074	0.049	0.542	0.565	0.462	0.667								
Tr	0.395	0.340	0.385	0.380	0.402	0.347	0.382	0.403							
PR	0.552	0.545	0.615	0.042	0.089	0.110	0.068	0.036	0.401						
PB	0.035	0.047	0.031	0.764	0.689	0.480	0.629	0.518	0.393	0.060					
SP	0.072	0.105	0.083	0.373	0.435	0.235	0.508	0.411	0.410	0.062	0.458				
PV	0.126	0.135	0.105	0.568	0.552	0.399	0.524	0.462	0.395	0.138	0.654	0.379			
Te	0.060	0.111	0.088	0.430	0.487	0.548	0.496	0.359	0.343	0.108	0.441	0.268	0.442		
CI	0.060	0.114	0.069	0.422	0.400	0.381	0.418	0.311	0.295	0.120	0.465	0.221	0.551	0.468	

Table 7. Formative measurement model evaluation.

Second-order formative constructs	Constructs (first-order reflective)	Weights	VIF
MUIPC	Perceived Surveillance (PS)	0.277***	2.871
	Perceived Intrusion (PI)	0.396***	2.856
	Secondary Use (SU)	0.431***	2.296
Ubiquity	Time Savings (TS)	0.366***	1.930
	Spatial Flexibility (SF)	0.289***	2.197
	Portability (Po)	0.194***	1.696
	Immediacy (Im)	0.272***	1.790
	Continuity (Co)	0.134***	1.461

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.