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IT Consumerization Actual Use: Conceptual Model Development

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Abstract

At a time when technology "As a Service" is common place for delivering information system solutions and in particular workplace mobility services, IT Consumerization has become a staple within the large enterprise workplace services portfolio. Having a conceptual design to extend and grow our knowledge about the phenomenon is a critical prerequisite for both academic and business persons alike. The purpose of this paper is twofold. First and in a very broad sense, this paper provides new researchers with mindfulness toward applying existing historical theory within their own research discipline toward their phenomenon of interest, and thereby fine-tune the conceptual model to the current challenges apropos for today's industry and academic fields. Secondly, this paper takes a deeper dive into the phenomenon of actual use of IT Consumerization services in today's business world providing steps to practitioners who are seeking to enable change and learning in a corporate setting through the use of mobility workplace services. The following conceptual model integrates one of the theoretical frameworks

instinctive to the information system stream of research where actual use behaviors are at the forefront. In having a quality conceptual model, we as researchers will then find ourselves in a position to grow a sound foundation for future research.

Keywords: IT Consumerization, Actual Use, Theory of Planned Action, Mobility, Workplace Services

1. Introduction

The purpose of this paper is to present a conceptual model for assessing influences upon the intention to use and the actual use of a mobile workplace application. Information Technology Consumerization (ITC) is a technology solution which focuses upon the mobile workplace and mobile application services. ITC is not an uncommon mobility solution for large enterprises across the globe. This service is offered by employers to their employees allowing personal devices (privately-owned hardware) access into their workplace applications. The question is: How often or with what regularity is this mobility service actually used by the employee? For organizations and other business groups, gaining subscribership is critical for the realization of a return on the investment (ROI) from the actual costs associated with deployment. Companies must evaluate the total cost of ownership and then decide if it is the right strategy for their IT Services model. Once a decision is made, the risk is whether or not employees will adopt and how will the employer keep them using the service. In the workplace, it may be an organizational culture shift to gain full adoption of any technology solution. The shift may appear to be a bigger leap for an older work force (Baby Boomers and older Gen-Xers) than for their younger colleagues (Millennials). To assess employee's actual use perceptions of IT Consumerization in the workplace, a research model was developed to evaluate the conditions. A predictive model examines the proposed drivers of actual use of ITC in the workplace and ultimately provides guidance on tactical positioning of these drivers to increase subscribership. Both practitioners and academics can gain further awareness about the perceptual influences impacting actual use behaviors from the model. For the practitioner, understanding these early influences may lead to greater understanding about the sale and delivery cycles associated with the product, as well as

further understanding into the optimization of use. As academics, the outcome of model testing will broaden our thinking about the intentions to use and perceptions that influence actual use.

For academics and researchers, the Theory of Planned Behavior is often seen as a starting point for conceptual model development, especially for those studies which examine intentions to use. The proposed model focuses upon understanding the influences which derive from the individual's perceptions leading to their intentions to use and actual use. For large enterprises, ITC services in the workplace are typically implemented as part of the workplace mobility services portfolio; however, the potential opportunities for a broader range of companies to offer the service will most likely increase over time. Unlike previous studies, which have targeted students, university personnel, and other learning institution employees, the proposed research model targets a large enterprise workforce within the technology industry. The ITC model incorporates a single dependent variable representing actual use and is connected to survey responses related to confirmed usefulness, hardware selection, and application identification. The conceptual model was developed in an effort to expand the existing ITC research stream by positioning three new independent variables which are proposed to impact an individual's intentions leading to actual use: Personal Innovativeness toward Information Technology (PIIT), Service Quality Empathy (EMPT), and Service Quality Responsiveness (RESP). Future research opportunities are presented at the close of the paper.

2. Prior Research

Today, many corporations are finding that technology solutions are being delivered as a service [13]. Service as a solution is demonstrated by the technology industry by easily provisioning various cloud solutions for potential customers across the globe. The use of mobility and other workplace tools is considered to be "software as a service" solution and helps business leaders to guide their employees into becoming more effective and efficient with their work role tasks. As with most computing technology solutions, the ubiquitous nature and dynamic rate of change often drives these solutions to become more affordable for smaller businesses looking for the same improvements in effectiveness and efficiency [35].

2.1 ITC and the "As a Service (AaS)" Evolution

Similar phenomena in the Information System (IS) research steam include the development and use of remote access tools such as the UWYT (Use What You're Told) remote access strategy. The employer identifies specific personal hardware that an employee can use in the workplace to access specific applications [37]. The research stream on remote access strategy also includes BYOT (Bring Your Own Technology) and BYOD (Bring Your Own Device). The BYOD strategy is the consolidation of personal and corporate productivity tools that leverage Wireless-enabled Authentication Protocol (WAP) on a single platform and is used for completing enterprise application tasks [29]. Finally, Information Technology Consumerization (ITC) is the use of employee-purchased devices as an entry point into the employer application portal either remotely or at an employer's facility [22], [29], [33].

Consider the historical footprint associated with the need for remote access as the progeny for a variety of technology solutions and then introduce the quest for mobility everything for all consumers everywhere. Overtime, we have seen the development of technology solutions which can be provided as a service versus having the physical equipment and software licenses owned by the employer. The ITC strategy allows the employee's personal device to reach the services-style, cloud-based solutions.

Some of the service-style, cloud based solutions include platforms as a services (PaaS) and software as a service (SaaS). This approach puts the cloud maintenance, hardware, and licensing in the hands of the provider. It allows faster availability of computer platforms and the allocation of space, all of which can be priced as on-demand or as capacity used by the target consumer. Companies only pay for the services required and not the warranty and maintenance associated with total cost of ownership of the physical capital. Business organizations can apply the same logic toward the employee's mobile devices that are wired to access these services. The employer that provides the ITC option, where the company does not own the mobile hardware realizes the savings associated with hardware costs similarly as with a cloud-based solution by reducing the total cost of ownership associated with the physical hardware/software from where the services are accessed.

Technology companies continue to promote the anytime and anywhere delivery of information system to the potential business customer as part of the Mobility Workplace services solutions.

Of course, select employees may still be issued a physical laptop having access to the tools associated to their work-role while still making smart phone technology optional for other work roles. Understanding how the "As a Service" is associated with ITC gives us a better understanding of how the use of ITC truly remains a voluntary solution for many potential subscribers.

As discussed previously, the potential outcome for any organization which offers the ITC service solution and the ability to sustain subscribership stemming from actual use is then to begin the cycle of eliminating a portion of hardware-related procurement costs. But deploying new solutions and embracing change by the employees who make up the organization must also be considered. If an organization can assure corporate security, manage risks, and provide opportunities for employees to perform additional tasks beyond the standard eight-hour work day, the service remains a sound investment. The organizational culture may see this as an acceptable norm as well as an opportunity to use the personal device to perform responsibilities as part of its standard work day. But the individuals that are employed by the organization must embrace the change. Gaining enough confidence between employer and employees, thus making them willing to try using IT Consumerization as a workplace service is the first step. When actual use behaviors drive the formation of the habit of use, then the habit of many can set the workplace norm for future employees to use the solution. Companies including Hewlett Packard, Dell, Iron Mountain, IBM, and AT&T have already provisioned IT Consumerization as a service available to their employees [5]. It is from this perspective, along with the Theory of Planned Behavior that the proposed research model is conceptualized.

2.2 A Conceptual Model for ITC Actual Us

The conceptual model is developed by first targeting the theoretical framework of the Theory of Planned Behavior (TPB). This theory calls out specific attributes that influence an individual's intentions and ultimately the performance of actual behaviors. [4] noted that TPB is a good match for studies that include a social behavioral construct. Due to the permanence of social networking, which is both a virtual and physical human habit, it seems appropriate for social norms to be included in this research project which focuses upon use behaviors and mobile devices. Another well-grounded theory which was considered was the Technology Acceptance Model (TAM). TAM was not selected as the theoretical underpinning for two reasons. As stated,

social norm influences were of interest for this research design and TAM does not support the social norm element. Additionally, actual use was another critical design element, and as discovered, previous studies seem to turn more toward TPB if actual use was being assessed. Although TPB and TAM are in agreement regarding the assessment of ease of use and its relationship to technology acceptance, some system researchers have discovered that TAM constructs do not always predict actual use behavior ([24], [36].

[26] completed a comparative study on predicting user intentions between TPB and TAM. He determined that TAM was easier to apply than TPB. Furthermore, he provided the observation that TPB is better for identifying the complexity of the intention to use and actual use behaviors [26]. Further academic understanding is gained about technology use behaviors by first distinguishing how people decide to use and then by determining the act whereby their thoughts are framed into behavioral intentions to use. For the researchers of ITC, fully understanding the actual use behavior requires knowing the details necessary to identify both beliefs (thinking) and attitudes (feelings) which influence the users' original decision to use the available technology service [5],[41], [26], [27]. An examination of these phases of the thought process should provide additional insight into understanding the complexity of usage and continued usage. The idea of understanding the intricacy of human intentions and the drive to understand actual use behaviors allows the proposed theoretical ideas to evolve into a more complex conceptual model

The conceptual model offers a framework that reflects the idea that perceptions of IT support, personal interest in IT innovation, and application preference, along with other points of interest may improve subscribership to the services. For this study, not only were the employees' positive and negative beliefs examined, but also the influences from co-workers and a sense of voluntariness to use was considered. All are proposed to be potential influencers upon the employee's attitudinal and behavioral intentions. The collection of these variables is based upon the existing IS literature, along with well-grounded, behavioral research.

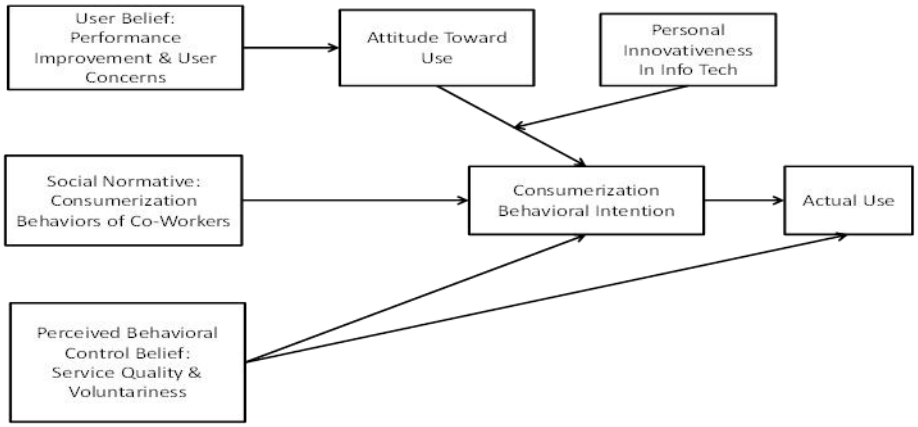

Figure 1. ITC Conceptual Model of Actual Use

The research theoretical propositions displayed in Figure 1 are important extensions of the existing research stream [22],,[29], [33].

3. From Conceptual to Operational Model

The constructs that are to be assessed as they have been expanded in the conceptualization of actual use include perceptions of positive and negative beliefs, attitudes, social norms, and perceived behavioral control based upon the theoretical model. They must be operationalized as to be used in a future research studies. These same constructs are then used to move from the research questions into the conceptual model and forward on to operational model development.

3.1 Positive and Negative Beliefs

Beliefs are identified as thoughts about potentialities of an object [3],[4]. Belief-focused research has been a prominent variable in behavioral research, especially that which examines the influences affecting our attitudes and our intention to use a product or service. Positive and negative beliefs can be any perception which leads to ideas of advantages or disadvantages achieved through actual use. The use of the IT Consumerization service research has uncovered similar relationships with perceptions of intention.

Some of the potential advantages uncovered in mobility services research include accessibility to services, reduction in wait and travel time, and most often convenience [30], [14], [18]. IT Consumerization research has found that employees have identified performance improvements as a perceived expectation leading to an intention to use an IT Consumerization service in the

workplace [21], Loose, et al., 2013; [32]. A potential disadvantage evident in the mobility services research stream pertains to privacy-related concerns, especially in the use of e-commerce and banking transactions via wireless communications [23], [40], [42]. Recent research in the area of IT Consumerization in the workplace has revealed similar concerns which relate to privacy and security. The belief perceptions often generate feelings which are attitudinal in nature and can also influence our intention toward use. The following propositions are considered to be appropriate for examining the relationships presented in the model.

P1a: Privacy and security concerns about personal information loss or misuse will negatively influence an employee's attitude toward behavioral intentions to use IT Consumerization service in the workplace.

P1b: Perceived performance improvements will have a positive influence on the user's attitude intention toward the behavioral intention to use IT Consumerization in his/her workplace.

3.2 Attitude and Personal Interest

Different from the individual's beliefs, which are about the assumed potential of an object, attitudes are about the feelings we may have toward an object. Based upon previous consumer-based research, positive attitudes toward an object create a positive feeling about the use of the product [30]. If the object is considered to be a new and innovative product, and individuals are considering use, their own personal interest in innovations may enhance the positive feeling or positive attitude necessary to consider use. Some researchers discovered that highly innovative individuals who were exposed to various technological innovations began to use with some immediacy. Consequently, they set the pace to the broader consumer stream through the adoption of new users to the technology offering [6]. Those individuals who exhibited personal innovative traits were known as early adopters [1].

Personal innovativeness toward information technology could be described as the "excitement of trying something new". For my research, trying something "new" means to use a personal or private wireless device to access corporate applications in order to complete work-related tasks. More specific descriptions and sophisticated research already exists with regard to personal innovative characteristics and behaviors. The development of the PIIT (Personal Innovativeness in IT) construct was originally established in an effort to identify the traits of early adopters of technology [1]. In their study, they proposed a moderating effect upon technology acceptance.

However, other consumer research found support for personal innovativeness as a partial predictor of user attitude leading to the intention to use mobility services [17]. My study examines early adopters within an organization of potential adopters who may have either an intention or both an intention and demonstrated actual use behavior.

P2: Personal Innovativeness moderates the relationship between the attitude towards the intention to use the service and the behavioral intention to use IT Consumerization in the employee's workplace.

3.3 Social Normative

IT Consumerization research has considered the idea that social influences may affect an individual's decision to use the service. Social normative behaviors are presented within this stream of research as coming from co-workers, supervisors, and managers who may influence the employee's attitude toward behavioral intention to use [10], Loose et al., 2013; [33]. My research is an extension of these foundational studies and is intended to examine the influence of the social norm on those individuals who were found to be actual users versus those individuals who only considered use but were not actually using the service. An employee's perception of a coworker's experience may be a driver for considering the use of the IT Consumerization service on his/her personal device. On the other hand, the social normative may also influence non-users differently than for those who are already users of the ITC service. Hence we propose:

P3: Co-workers who use IT Consumerization in the workplace will positively impact an employee's behavioral intention to use IT Consumerization in the workplace.

3.4 Service Quality

IT Consumerization research has revealed factors that appears to be representative of service quality and which have indicators of explanatory power directed towards the behavioral intention to use research stream. [33] identified beliefs regarding technical support (usage and installation) attributes that do affect intention to use. However, in order to understand how service quality has been blended into IS research; we should consider consumer and marketing research on the topic as well. In early consumer research, the most widely used model for assessing service quality was developed by [34]. Their model provides the researcher with a method for evaluating service quality by examining the gap between the consumer's expectations and the perceptions of service performance for IT Consumerization [19].

These ideas are assimilated into what an employee might perceive of her/his own IT Department supporting the IT Consumerization service. An employee's expectations of the IT Department may influence the attitudinal intention; the attitude toward use may be different for actual users of the service versus non-users who only considered use but were not actual users. Again, we propose:

P4a: An employee who perceives high levels of empathy from the IT Department will have a strong employee behavioral intention to use IT Consumerization in the workplace.

P4b: An employee who perceives high levels of responsiveness from the IT Department will have a strong employee behavioral intention to use IT Consumerization in the workplace.

3.5 Voluntariness

Also found in consumer-based technology use research is the concept of voluntariness. For example, mobility services which are system services or related mobile applications, these are available to wireless devices and they promote consumer convenience and are considered voluntary solutions. Tasks which could be completed by alternate means have the convenience of the mobile application as an alternative, and if used are done so on a voluntary basis. The mobile service provides voluntary applications and graphical user interfaces for such services as commerce, banking, and other related transactional services. Mobility Services also provide an alternate, voluntary link between the consumer and supplier in support of the consumer/supplier relationship [18], [30], [40]. Consumers may choose to use these services via their personal devices, or they may make alternative arrangements for engaging and/or completing an applicable transaction with the supplier.

This idea is interesting from the perspective that our private devices may also become work-task devices too. An expansion of the use of the device to include any added service may result in continued use, which may be further realized as the technology becomes a dual use appliance [15]. Employees may choose to use the IT Consumerization service provided by their employer; tasks that could be completed via an alternate means would be perceived as voluntary. Understanding how the perceptions of voluntary influence actual users of the service may impact an individual's intention toward use differently than those of the non-user group; therefore leading us to propose:

P4c: Perceived voluntariness will have a positive influence on the employee's behavioral intention to use IT Consumerization in his/her workplace.

3.6 Intentions toward Use and Actual Use

Intentions toward use are central to the Theory of Planned Behavior and are derived from well-developed cognitive research studies of the many predecessors and successors. In the field of IS research, interest continues to grow in the direction that with the intention to use comes the examination of actual use. Researchers have examined deep use and complex usage from a system user's perspective [8], [20], [25], [31]. These researchers have examined either deep usage, in which case a multi-level system of use occurs within an organization or complex use, which occurs at the individual level within the system itself. Researchers who apply the structural perspective of organizational use advocate that use studies are best designed with all three areas combined. These areas include individuals, groups, and organizations with each area's perceptions being assessed in an effort to understand technology use success [7]. The complexity of individual use and deep usage assessments are also seen in studies which examine post-adoption behaviors, an example of which includes studies focusing upon extended use, the use of multiple features, and motivational factors that influence continued use behaviors [2], [9], [16]. My operational model is finalized with the actual use dependent variable for the user group of the IT Consumerization services study. Therefore we propose:

P5: The more favorable the attitude intentions toward IT Consumerization use in the workplace, the higher degree of behavioral intention to use.

P6: Behavioral intention to use IT Consumerization in the workplace leads to confirmed usage.

The propositions into actual use research by moving beyond the familiar elements often examined as indicators for an intention to use lead to the hypotheses as reflected in the figure below as the operational model for this study.

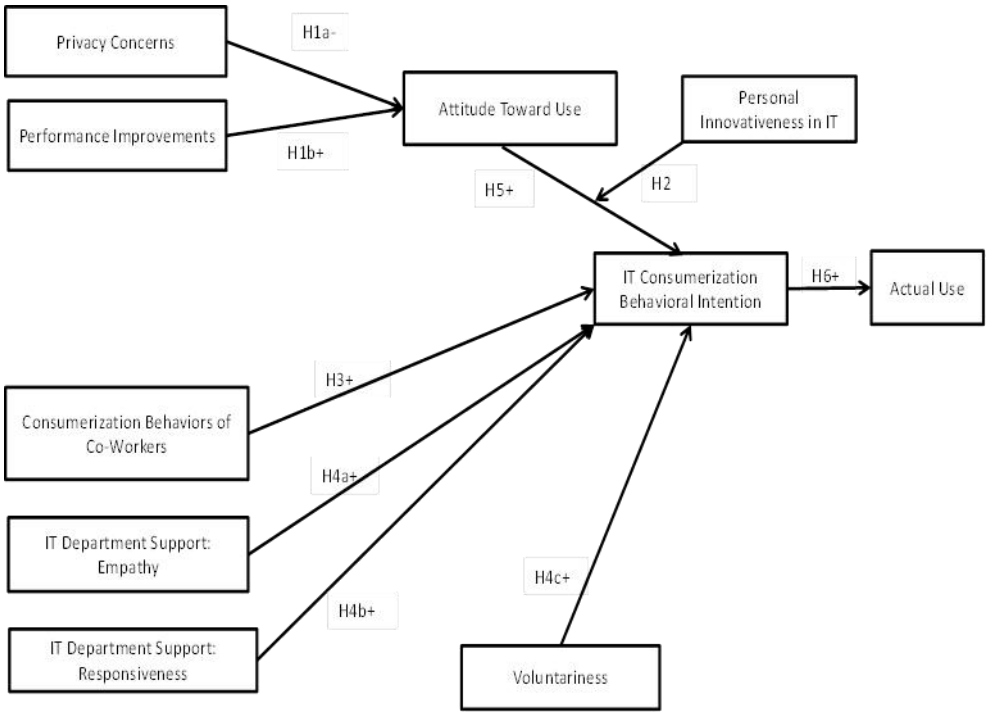

Figure 2. ITC Actual Use Operational Model

The following sections provide a definition of the ITC service and workplace use. Along with the description of the theoretical underpinnings, the conceptual background for each individual variable is discussed in detail. Finally, model validation evaluation results are presented including relevant statistical interpretations leading to future research opportunities.

4. Discussion

The potential for future academic research is an outgrowth of the present study and includes focusing upon three areas of expansion. First, because the ITC conceptual model is unique in that it has both intention to use and actual use, it promotes and develops a mechanism to further understand the motivation associated with the adoption of IT Consumerization services in the work place. Second, it is a model that can be leveraged for future field studies which address heterogeneity within a population where actual use is not always a continued behavior even when intentions to use seem relatively similar for both the potential users and actual users. Finally from the practitioner's perspective, by having a better understanding of the conditions in which the behavioral intentions lead to actual use, will ultimately help both the sales and delivery organizations of such service. Improved understanding within these teams in turn promote the

conditions that lead to actual use and reduce the conditions that retract from subscribership. Based upon the presented model, closer consideration should be paid to the interpretation of organizational service quality necessary to support the service and the possibility of an individual's personal innovativeness toward IT whenever deploying voluntary services such as ITC. The three highpoints from the evaluation study are the consideration that intentions are not enough, the inclusion of a deeper dive into heterogeneous conditions, and the careful examination of the proposed variable which promotes or diminishes application subscribership.

The idea that actual use as a means of developing a full understanding of the phenomenon, one must first consider that intentions to use is a mainstay from many theoretical behavioral models. Today, there is competition for technology use. It includes both tool and system performance but also that which makes the employees themselves more productive. It is no secret that effectiveness and efficiency can result in organizational savings. However improvement in efficiency is not difficult to measure when capital expenses are simply eliminated. The elimination of capital expense and the simultaneous employee behavioral change may be in tandem events and merely understanding the intentions alone is not enough. Further research into just the intention to use measures may not lead to Actual Use. Therefore, if the initial perceptions of change are not properly promoted within the delivery of the solution then nothing will be gained for practitioners or academics.

The evaluation study suggested the idea of considering heterogeneity of the target audience and promoted the plan for future use of more rigorous statistical methods for the deep dive into heterogeneity of a larger sample field study. Examining a target audience on same exogenous and endogenous variables leading to actual use may influence further research. Understanding perceptional differences between those individuals with only intentions to use versus actual users may also be different with regards to personal interests toward innovation or the expectation of technology support service. This may lead to more complex assessments into the phenomenon of the theoretical framework itself.

Additionally, for those variables that promote or diminish service subscribership as a means to develop the framework in which any service is implemented for employee use, it is advised to consider conditions which examine the beliefs and attitude driving human intention toward use.

Both attitude (feelings) and beliefs (potentials) about an innovation can aid the researcher into a richer understanding of complex individual decision making processes.

Another consideration for researchers who examine service quality perception within the Business to Employee (B2E) environment is that the driver of intentions to use may lead to a demonstration of actual use and may be influenced by the perceptions of what is voluntary. Large Enterprise (LE) voluntariness may be perceived differently than other populations, i.e., student user sample, simply based upon expectation of personal device use and constraints deemed necessary by corporate security policies.

Much of the previous research associated to remote access strategy is based upon the responses from university sample sets. The usefulness of my model framework targets the Large Enterprise (LE) experience and primes the academic research work stream to posture results that can be used by practitioners as well. Furthermore, for results that may actually be more applicable to the SMB (Small to Medium sized Business) environment, the Large Enterprise model and resulting research may be more applicable than those provided by student-based populations. Future research initiatives would be to use the presented model with a larger audience within the Large Enterprise domain or to examine the difference between the perception of LE and SMB employees.

The next step for further examination of the conceptual model is to apply the research design to a larger audience who had been given an opportunity to use the ITC service. With a larger sample, more data would 1) enhance the rigor of the model's evaluation methodology and 2) advance the quality of the data analysis and thus improve the interpretation of the results. By comparing similar populations (type of work stream and demographic) and examining both employee intention and actual use of the ITC services for the two business groups (LE versus SMB) difference may be discovered on what leads to actual use for each target audience. Through the examination of the results associated with my conceptual model and lessons learned, the study could be more appropriately applied from the LE experience to the SMB employee. These potential differences guide the practitioner who delivers technology services to follow a framework that best fits the target audience.

Of course, it is useful to have a greater understanding of demographic influences upon employee intention and actual use of an enterprise technology innovation within the workplace. With the

average employee age widening and the retirement age for full-benefits increasing, the older (and wiser) corporate professional is staying in the workforce longer. Both age and/or years of experience within any selected industry may influence the intention to use and actual use of workplace mobility tools. Second, future consideration might be given to companies outside of technology-based organizations, and specifically to teams which support business administration, sales, project management or financial practices in industries such as healthcare and government services.

An employee's perceptions of technology and their self-perceived innovativeness toward technology may be different for those individuals who have a work role directly within the technology industry versus when corporate technology experiences may be diluted by organization size and/or function. An aging workforce may perceive technology use differently than that comprised of a younger generation, and may have a different expectation of the tools and services provided by the employer. The evaluation study included respondents who were mature in age and in their years of experience. More research is needed to determine the effects of an aging workforce where technologies are emerging quickly and growing in complexity. Understanding more about personality perceptions, i.e., personal innovativeness, might offer additional insights into initial use and actual use behaviors.

For practitioners, those delivering technology solutions to their customers and those receiving mobility workplace services such as IT Consumerization may have different perceptions of usefulness, both positive and negative. The potential difference in perception can be contained within one company where unique organizations exist across a large enterprise. The technology recipients are users of technology and information systems who promote internal process improvements and therefore deliver the disruptive innovation for a company-specific service. Disruptive innovation meaning technology change halting current practices and improves the workflow going forward. These new technology approaches improve sales, customer relationships, and of course effectiveness and efficiency of the users. A technology industry which develops IT/IS solutions and services which potentially fit into the recipient industry disruptive process model are again leveraged as the stepping stone for the recipient's company-specific innovation. The ITC Consumerization service may be viewed differently by the employees of these two unique industrial organizations.

Due to challenges for the academic researcher to establish and actually maintain a corporate workforce relationships with a large enterprise, today's research stream has often been limited to students and other university faculty. Because of this condition, most attempts at gaining access to employee-based data can be expensive with the researcher being overwhelmed by security concerns associated with the data collection process. Finding business contacts is not always possible and having a corporate-based data set which represents responses and perceptions associated with the newer phenomenon is neither readily available nor accessible in a timely fashion. This evaluation study is fortunate to have the proper sponsorship and corporate enterprise contacts to gain qualitative data survey feedback, as well as evaluation data collection on the survey tool.

5. Conclusion

The overall conditions observed during the assessment of evaluation data provided insights about how to fine-tune the future field data questions for improved quality. Observations from the evaluation data correlation assessment are early warning signals of potentially similar conditions between and within the model's constructs. The lessons learned from the evaluation study are now captured for improving the field study design. In conclusion, the pre-assessment results guided the researcher to fine-tune the definitions of the constructs, and the evaluation study data helped the researcher to improve the quality of the overall survey design.

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