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MODELING THE SCAPE OF INTERNAL IT USER SATISFACTION WITH IT SERVICES PROVIDED IN THE FIRM

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Abstract

This inquiry positions the IT services function within the firm's internal utilization environment as a value driven quality focused operations interface oriented to influencing user satisfaction. The nomological objective elucidates firm's internal IT user satisfaction as a resultant of technology affiliated task factors defining the IT domains' service scape in tandem with user associated attributes connoting individual IT utility attitude. The modeling frames the relevant constructs' domains geared to the firm's IT services rendering mechanisms, technical delivery facets, assistive technology structures, and support systems in congruence with IT user's capabilities and proclivities for technology affiliated cognitive processing and work utility functioning bounds posited as determinants of internal IT user satisfaction. The discourse works to operationalize this model of internal IT user satisfaction with IT services provided by the firm in its defined contextual frame of measurement scales' development and empirical testing methods employing suited multivariate techniques for the data analyses. The narrative explicates statistical and substantive significances of the findings. Limitations of the study are discussed with future research directive.

Keywords: *IT Services, Firm, Internal User, Process, Support, Staff, Technology, Satisfaction*

Introduction

The premise of this inquiry stems from research dynamics in intraorganizational governance wherein the IT (information technology) function in the firm be positioned to provide cohesive quality focused services to its constituent users within the enterprise network (Commerce, 2007). Thereby the firm's IT department is tasked to operate as an integral business function in its capacity for rendering efficient, timely, user-focused, and effective IT-related services to its employees. The IT functionality here accounts for all technicalities of the IT tasks, people, processes, systems, and technologies at play in services delivery scape. Accordingly, this paper works to empirically operationalize the model of internal IT user satisfaction with firms' IT services as originally proposed by Chaudhary & Byramjee (2024). The nomological discourse evaluates theoretical facets of pertinent literature streams to explicate the posited relationships among the modeled parameters constituting the IT service utilization environment for user proclivity and satisfaction. The empirical narrative thereupon describes the procedures adopted for the measurement scales' development, instrumentation, sampling frame, data handling, and suited multivariate techniques applied for the data analyses along with the statistical and substantive significances of the findings.

Literature Review of the Theoretical Constructs and their Nomological Relationships

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In the relational process between IT support staff and internal users, as the familiarity and experience of internal users increases, process awareness tends to improve due to the direct correlation between the two. This is connected to social capital theory, particularly cognitive, and relational process, which has been found to positively affect overall user satisfaction of the internal user (Sun et al., 2012). As with most intellectual pursuits, the more humans are exposed to and able to become accustomed to a phenomenon, the higher propensity of comfort and success they should experience with said phenomena. This connects to cognitive absorption which is the overall broad experience that an internal user experiences when receiving IT support. User expectation, optimization, and applicability of process-awareness have been shown to have direct and indirect effects on user satisfaction (Deng et al., 2010). Therefore, management or decision makers within an organization should be cognizant to consistently monitor, discuss, and evaluate their respective internal users' use of technology to ensure that time is not wasted and value-added experiences are occurring when technology is accessed and utilized. Relatedly, these efforts should in effect minimize an organization's dollar allocation spent on IT support services. Interestingly, the dynamics of internal user satisfaction shift based on the size and scope of an organization. For example, within small businesses where the owner is typically the main individual performing and implementing IT functions, their process-awareness is directly impacted by IT training they seek out and obtain, software maintenance and any related IT vendor support they may receive. Personal characteristics such as gender, age, race, education level, and other owner attributes play a significant role in user satisfaction regarding engagement with IT services (Palvia & Palvia, 1999). In cases where a small business owner does not want to deal with IT themselves, the option of IT consultancy exists and may prove to be a long-term formidable business selection for the small business owner. This situation holds true for larger organizations too; studies suggest that the size of an organization should not factor in establishing a business relationship with IT (Kettinger & Lee, 1994). From a meta-analysis vantage point, Mahmood et al. (2000) conducted a study on variables which show significance on end user satisfaction regarding IT support services. This interacts with the technology-related process-awareness ability of an internal user for accessing IT support services by evaluating which variables would show significance and after empirical testing, they all demonstrated positive significance on end user satisfaction. However, the variables like user experience, user attitude, perceived usefulness, organizational support, and user involvement in system development demonstrated the highest level of significance for proving end user satisfaction. Customers of a business also engage in IT related services where the customers become internal users, and they must put their process awareness acumen to the test. For example, if a customer is conducting business on an online banking website or app, if they encounter difficulties with the functionality of the web service, they are given the option to immediately troubleshoot the issue, usually through an artificial intelligence (A.I.) chat or live chat option with a human operator. Regarding this, organizations must be keen to offer user-friendly online web options that minimize computer anxiety (which can moderate continuance intention) and serve to aid in customer retention and re-use of the online service (Kang & Lee, 2010). In this sentiment, it becomes necessary for firms to understand process-awareness and user satisfaction extends beyond the parameters of inner-organizational IT support use, but outward as well to customers that become alienated with outdated or inept IT support services. This nomological conjecture thereby manifests in the following empirically testable context:

Hypothesis 1 *– Internal User's Technology-related Process-Awareness for Accessibility of IT Services results in higher levels of User Satisfaction with the Services Provided by IT.*

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Possessing the capability to navigate the technology landscape is a place that internal users want to be at. Technology is ever evolving; therefore, it is critical that individuals are familiar with it and that they can adequately handle feedback and instruction on technology use from IT support staff. Dishaw & Strong (1999) suggest that the technology acceptance model (TAM) and the task-technology fit model (TTF) are best suited to working in tandem with one another, as opposed to working separately. TAM focuses on how users perceive and utilize a given technology (ease of use), while TTF focuses on the dynamic between a given technology task that a user needs and its relationship with the available functionality of the given IT. They found that when TTF is integrated into TAM, users' capability increases in higher user satisfaction. Igbaria & Tan (1997) combined TAM and TTF and they found that user's system usage and their satisfaction significantly impact the individual performance of the user. This affects the level of capability a user may possess, determining how much satisfaction they have using technology and IT support services. In fact, they found that system usage has a partial mediating effect of user satisfaction on individual performance. An individual's proclivity for IT utilization is going to be based on a multitude of factors, which can vary based on degree of effect, from individual to individual. As mentioned, cognitive absorption is going to play a significant role in level of proclivity (Deng et al., 2010). Additionally, four distinct character traits such as innovativeness, optimism, discomfort, and insecurity can be significant in the level of proclivity displayed by an end user- all contributing to the level of user satisfaction experienced (Walczuch et al., 2007). They combined the TAM with the technology readiness index (TRI) to demonstrate the effect of the four traits on the proclivity, and ultimately, the internal user's overall satisfaction experienced that would result from the use of IT support services. The results of the study found their expected results- the more positive the personality trait of an individual, the higher their likelihood to look favorable upon the technological support provided. To further encapsulate capability and proclivity, Wixom & Todd (2005) well-known study used an integrated model combining a user's attitude and belief about using technological systems and the user's thoughts and relative proclivity to use the technological systems. This is important because it frames the connection of relative usage of technology and support services based on how the system is designed and meant to be used. Just because a technological system is created and said to be user-friendly and comprehensive, does not mean the result will be it is readily used and favored by internal users. This connection has a direct impact on the utilization of IT provided services and technology use overall. Contrarily, a phenomenon that can have an impact on proclivity is 'technostress' which has alluded to technology induced stress. It has commonly been caused by displeasure with technology use and IT demands (Tarafdar et al., 2010). Key players must be certain to enhance and reassure internal users of the benefits and positive outcomes that come from technology utilization to stifle negative feelings towards technology. Regular affirmations of technology should be levied to internal users because technology cannot be sidelined in most circumstances, therefore, mitigation of technological avoidance should be implemented by key players, as necessary. This nomological conjecture thereby manifests in the following empirically testable context:

Hypothesis 2 – *Internal User's Technology-related Capability and Proclivity for IT Utilization results in higher levels of User Satisfaction with the Services Provided by IT.*

Technology is a pivotal part and key component within many jobs across numerous industries. Technology can enhance an employee's productivity, and conversely, it can hinder productivity

which can lower the level of an employee's satisfaction with technology and services provided by IT. Various uncertainties driving input, output, and conversion can detract from overall user job satisfaction (Brass, 1985). Regular communication and ongoing training between management and employees are thus common methods to strengthen employee technological use to strive for mutual satisfaction of the organization-employee technology dynamic. An employee's technological skillset is an important consideration for an organization to focus on in the hiring and ongoing job life of an employee. Employee attributes regarding IT and their propensity to be skilled in technology are facets that should be consistently monitored and evaluated. Organizations must work in tandem with employees to ensure that IT functionality is a vital component of the job, and the employees should commit themselves to being skilled in IT throughout their tenure. This leads to the spillover effect of IT satisfaction being a significant indicator of enhancing overall job satisfaction (Wang et al., 2020). Moreover, the job fit of an employee, in tandem with their IT attributes, is a component that should be consistently monitored by decision makers within the organization with their employees to ensure that employee job satisfaction remains at desired levels. When the segment of business is that a small-owned business, the technological attributes shift many times to just the owner, whom often may manage the firm as well, so the task of improving IT satisfaction may fall solely on the owner (Palvia & Palvia, 1999). In this regard, they may not have the time or energy to put the necessary focus on improving IT attributes, as does an organization with their employees. Interestingly, when you consider employee attributes of employees that work for a technology organization, the dynamic of striving for higher user satisfaction shifts to the physical work environment and atmosphere (DaSilva et al., 2021; Shan et al., 2014). Attributes such as personal relationships and management dealings become the variables at play for employees of a technology company whereas technological skill attributes of employees become paramount in a non-technology-based organization. Relatedly, within ICT-SMEs, where all employees have high IT functionality, user satisfaction highlighted by levels of feelings on supervision, communication, nature of work and rewards system are the determinants of higher level of internal IT functionality among employees (Valaei & Rezaei, 2016). This nomological conjecture thereby manifests in the following empirically testable context:
Hypothesis 3 *– Technology-associated IT Attributes/Functions pertinent to the Employee, as an Internal IT User for Work Operations in the firm, lends to generating higher levels of User Satisfaction with the Services Provided by IT.*

For IT support services to be effective, support staff must be cognizant to provide exemplary support to internal users to ensure the overall satisfaction of the customers. This aids in fulfilling customer satisfaction and contributes to long-term use of technology by internal users. The quality of service provided is a primary objective that support staff must provide to retain internal users' use of the relevant technology. Sun et al. (2012) suggests the relationship between internal users and IT staff should be based on a bilateral process that aims to build a sustainable working relationship where both sides contribute candid input on ongoing circumstances. Additionally, Shaw et al. (2002) study found that several end-user support factors such as user training, user implementation, and system response time, all have a direct impact on the internal user's satisfaction. Lacking these critical factors (or failure of IT staff to adequately provide these services) can be detrimental to the relationship between IT support staff and internal users. This study also demonstrates that the smaller the gap of perceived value and importance that internal users believe IT support staff are providing, the greater the opportunity of a favorable outcome of

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satisfaction internal users will experience when in contact with IT support staff. A custom-fit, comprehensive approach from IT support staff to internal users should be targeted to ensure that unique user needs are being rectified. IT support staff should modify their support approach on a client-to-client basis as needed to prevent ostracization and low user satisfaction. Moreover, this approach leads to higher customer satisfaction versus imploring a one-size-fits-all approach (Roslina & Saulan, 2019). The method of IT support delivery and type of support provided are pivotal factors in the satisfaction experienced by internal users. Older, more traditional sources of support such as handbooks and referring to online manuals have shown to be less effective in problem resolution (Maedche et al., 2016). Internal users can become frustrated with these types of materials, leading them to avoid consultation with IT support staff altogether, which can lead to decreased technology utility efficiency. Fortunately, new-aged methods of IT support such as machine learning-based help desk systems have proven to be effective for internal users. Relevant and accurate information can be gathered from this mechanism, as well as increased satisfaction due to decreased problem ticket resolution times (Al-Hawari & Barham, 2019). When IT support services are outsourced, unwarranted complications can arise due to factors such as variations in common methods of conducting business and language barriers. IT support staff management should ensure that regularly scheduled communication and prompt problem-solving measures exist with their internal users to continually strive to strengthen business relationships and retain their internal user client base (Bairi & Manohar, 2011). Jia et al. (2018) utilized social capital theory in their study and showed that the relationship between IT support staff and internal users has a significant impact on employee outcomes, including work performance and job satisfaction. This theory discusses how these behaviors- cognitive, relational, and structural capital, have a definite impact on how internal users perceive the quality of support services that they receive. Ultimately, it is imperative that IT support staff adhere to a bilateral relational approach because a unilateral approach on their behalf can diminish, and even eliminate, a support service contract for internal users of a given business. This nomological conjecture thereby manifests in the following empirically testable context:

Hypothesis 4 – *IT Staff's Support Services and Structures for Aiding Internal User's Technology Utility leads to higher levels of User Satisfaction with the Services Provided by IT.*

Prevalent within marketing literature is the 'ServQual' method which assesses and establishes a score for the service quality of support services rendered. Multiple areas and dimensions of service quality can be assessed to measure how effective it is and its significance on the user satisfaction of internal users. For example, measures such as user understanding, support services information delivery technique, empathy, and reliability are significant predictors of the effectiveness of the internal user's capability to rectify their unique issue that they have consulted IT support to help resolve (Kettinger & Lee, 1994; Badri et al., 2005). Furthermore, the use of 'ServQual' suggests that the greater the efficiency of resolution techniques delivered to the internal user, the propensity to accurately solve problems in a concise manner increases- all leading to satisfactory user satisfaction. IT support staff, in most cases, arrive at the situation task point with internal users as the individuals that are more knowledgeable and capable in a problem-solving relationship than the individual seeking the support services. So, it is imperative that IT personnel approach problem-solving situations with this mindset- while being careful to exercise patience, empathy, and the realization that problem-solving may be a multi-step process as the knowledge of technology by the designated internal user should increase as the relational process builds over

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time (Das, 2003). This reiterates the significance of comprehensive training and knowledge sharing methods within IT support departments to be competent and able to deliver high quality support services to internal users. When trust, interaction capability and interpersonal connection become the primary objective of IT support staff, a higher level of user satisfaction can be achieved by internal users (Sun et al., 2012). Within the past decade, the advent of artificial intelligence has become profound and will continue to be relevant and expand. Digital assistants such as Siri and Cortana have become widely used and their emotional understanding (when delivering problem-solving techniques to internal users) is heralded by their users. These techniques have been demonstrated to help increase user satisfaction (Gelbrich & Orsingher, 2021). As organizations adopt A.I. support technologies, it is critical that IT support staff are highly trained in these types of problem-solving mechanisms. With increased use of A.I.-based emotionally supportively digital assistants, advances in this area have become profound and evident. Conversely, older technology like Microsoft Clippy was found to be ineffective and troublesome by internal users, and resultingly, this can adversely affect overall user satisfaction (Maedche et al., 2016). This nomological conjecture thereby manifests in the following empirically testable context:
Hypothesis 5 – *IT Function's Support Services and Abilities in Assisting with Internal User's Problem-Solving Needs leads to higher levels of User Satisfaction with the Services Provided by IT.*

Figure 1: Model of Internal IT User Satisfaction with IT Services of the Firm [per the nomologically explicated frame of these posited relationships, by Chaudhary & Byramjee (2024)]

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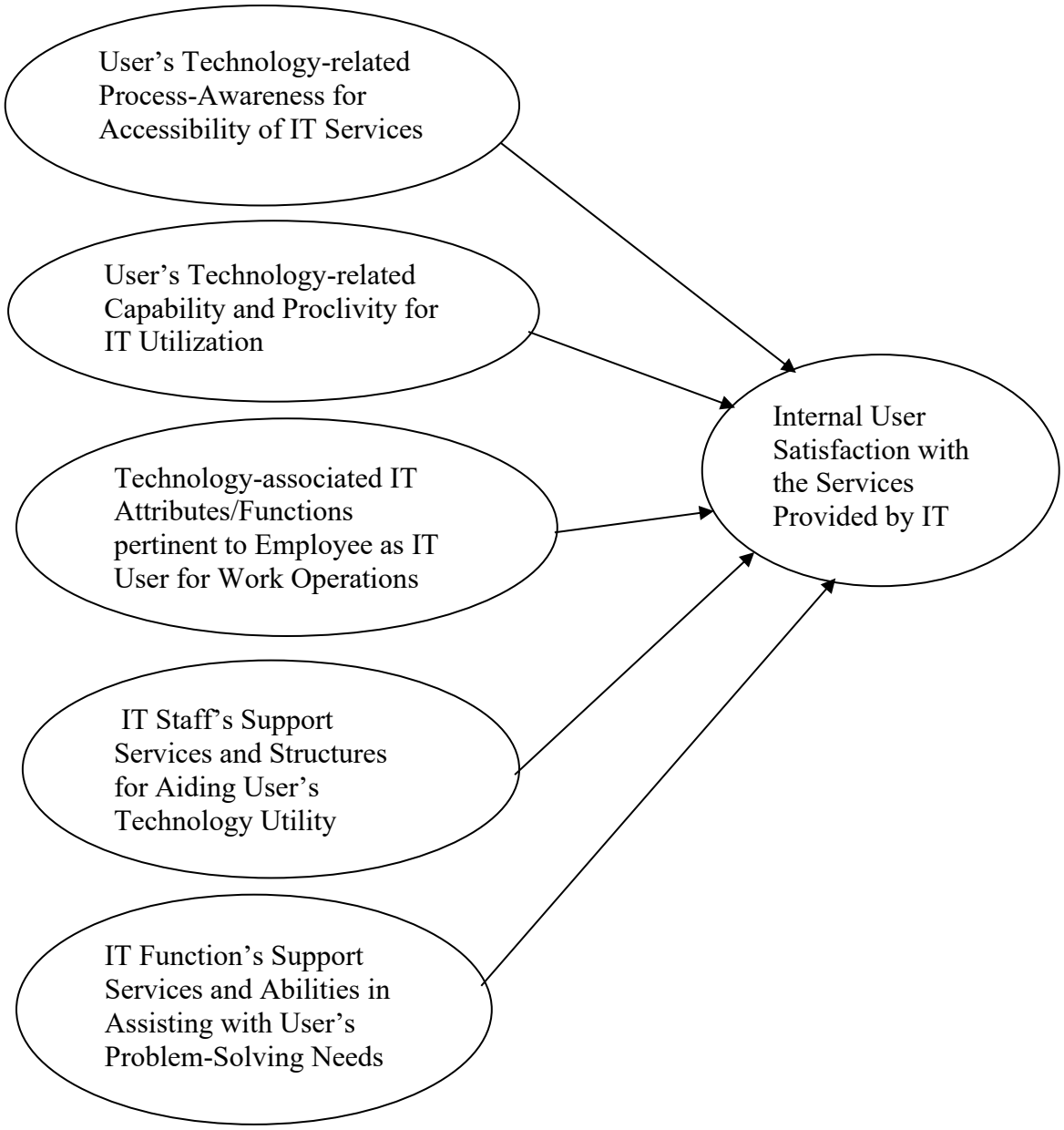

Operationalization of the Variables for their Empirical Measures and Measurement Scales

The operationalization of the variables and their appropriately suited measurement scales was decided based on the domain definitions for each of the constructs represented in the empirical model per Figure 1. The empirical indicators which adequately reflected the domain of each respective construct, thereby serving to reliably measure the construct, were corroborated by experts to assess their face validity and thereby the constructs' content validity (Nunnally, 1978).

Following the scale-development procedure mapped per Nunnally (1978), our developed measures of the model's constructs were subject to detailed reviews by deemed consulting experts who

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kindly judged the items/measures for face validity. These five experts were chosen on account of their senior managerial cadre within the firm's business divisions. They were themselves users of the IT function's provided services at the operating functional levels, coupled with their extensive experience and wide locus of cross-functional intelligence on varied IT associated user matters. Thereby, it ideally positioned these experts to relate to and comprehend the crux of our model's variables from a scientific inquiry perspective as well. Upon being briefed on the research objective the experts were presented with the domains of the constructs whereby they were made aware of all the dimensions of coverage pertinent to the scope of every construct as applicable to the organizational IT services environment. Based on an ordinal type points system which semantically scaled the continuum along which each item/measure was judged by the experts to represent its respective construct, the experts ascertained the measures'/constructs' face validity. The degree to which items latched onto their pre-determined constructs per our design in line with experts' validation was determined by us using a high majority rule such that at least four of the experts' judgment on each indicator's belonging to our theorized structure would then institute that item to that construct. After deleting just a few items wherein this majority norm was not met, the remaining items/measures were slated by us with reasonable confidence in our empirical framework. Thereupon, as an additional exercise to corroborate this latest slated schema of indicators' belonging to their respective constructs, this very same face validity judgment exercise was also further conducted among three other deemed experts. These were employees of the firm's IT function who were working in IT support services roles for more than handful of years, thereby accounting for their reach and exposure to their IT service delivery capacities. This set of judges' opinions very much aligned with the presented measures' validation of latching onto their respective constructs. Both sets of experts/judges unanimously opined that our final dependent variable of user satisfaction with the firm's provided IT services, definitive of the main research objective, be stated directly as a singular-item measure. This finalized our stance for the criterion variable as a unidimensional measure. This face validity exercise represented the suitability of our measures, judged appropriate by both the internal-client-user side and the internal-service-provider side of the intra-firm IT functions' value chain amidst our IT services delivery process user satisfaction model, for their empirical scaling and instrumentation procedures to follow.

Accordingly, our formulated constructs along with their respective empirical indicators which constitute the measures of our modeled parameters are shown below.

"UTPA" User's Technology-related Process-Awareness for Accessibility of IT Services:
Its finalized empirical indicators were as follows -
UTPA 1 - Being aware of the process to follow when needing IT related assistance.
UTPA 2 - Knowing how to request access to bank applications and systems.
UTPA 3 - Having sufficient knowledge or access to user guides on how to use tools like email, phone system, and voice mail.
UTPA 4 - Hours of operation of IT Support being deemed sufficient to meet user's needs.

"UTCP" User's Technology-related Capability and Proclivity for IT Utilization:
Its finalized empirical indicators were as follows -
UTCP 1 - Information security providing the knowledge and training to identify and easily report suspicious emails.

UTCP 2 - Having enough knowledge to practice good cybersecurity hygiene when working remotely.
UTCP 3 - Being comfortable using communications tools (Phone system, Outlook Email, Teams) effectively.
UTCP 4 - Being comfortable using productivity software tools (Microsoft Excel, Word, Power Point).

"ITOA" Technology-associated IT Attributes/Functions pertinent to Employee as IT User for Work Operations:
Its finalized empirical indicators were as follows -
ITOA 1 - Computer hardware (PC, Laptop) being reliable and fast enough to get user's work done efficiently.
ITOA 2 - Being satisfied with the reliability and performance of remote access services (VPN).
ITOA 3 - Being satisfied with reliability of the internal network to access email, shared drives, and information systems.
ITOA 4 - Being satisfied with the speed of Internet connectivity to access external websites for business purposes.
ITOA 5 - Having access to reports-related information that helps conduct business activities.

"ITSS" IT Staff's Support Services and Structures for Aiding User's Technology Utility:
Its finalized empirical indicators were as follows -
ITSS 1 - IT carefully listening to user's concern, addressing the problem, and explaining its solution in understandable language.
ITSS 2 - IT staff being knowledgeable about the key applications and tools used by the bank employees to perform their tasks.
ITSS 3 - IT being service-oriented and proactively helping the bank employees use technology effectively.
ITSS 4 - IT demonstrating strong ability in partnering to provide cost effective technology solutions for moving the bank forward.

"ITFA" IT Function's Support Services and Abilities in Assisting with User's Problem-Solving Needs:
Its finalized empirical indicators were as follows -
ITFA 1 - When contacting IT regarding a problem, being satisfied with the wait-time of their initial response.
ITFA 2 - Kept informed by IT throughout the problem's resolution process and their follow-up to ensure it having been resolved.
ITFA 3 - Being satisfied with IT's turnaround time for resolving user's problems (missing report, application error, printing issues).
ITFA 4 - IT providing notification in a reasonable time-frame when there is an outage situation for technology/network.
ITFA 5 - Being notified by IT in advance of planned outage or maintenance that impacts user or user's department.
ITFA 6 - IT offering an effective process for submitting requests (PC, Software, Phone).

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ITFA 7 - Being satisfied with IT's turnaround time for the completion of requests (New PC, Software Install, Access Request).

"IntUS" Internal User Satisfaction with the Services Provided by IT:
This unidimensional variable served as the main dependent criterion.
As decided per the face validity assessment, it was measured via its singular namesake indicator gauging users' overall satisfaction with provided IT services.

The respective items for the five predictors (constructs' indicators) as well as the criterion (single indicator) were measured as continuous variables. Each of these empirical indicators was semantically worded as a question in the survey instrument and measured via 1 through 5 likert-type scale with the anchors being 'strongly disagree' and 'strongly agree' respectively. It was a balanced non-forced choice scale with the correspondence rule reflecting users' rising level of sentiment with facets of the IT services via agreement along higher response position on the scale.

The survey also included two categorical variables, namely "Medium" and "Role", each measured along nominal scale. The Medium variable accounted for the venue that users turn to when faced with technology problems or requests for issues like IT applications, network connectivity, password resets, scanner and PC queries, and the kind. Medium was categorized by response positions 1 and 2 which represented respectively IT support via email/helpline channels and IT support via web/online helpdesk channels. The Role variable defined respondents' functional designation in the organization's hierarchy. Role was categorized by response positions 1 and 2 which represented respectively users' designation as managerial/supervisory and users' designation as operations/administrative/support/sales.

Research Design Implemented

The survey questionnaires were administered online via a well-articulated viewer-friendly web browser. The sampling frame constituted users of IT services in the firm; the respondents who completed the survey spanned varied designations and functional departments/divisions, thereby meeting the norms of our sample being random and indeed representative of the population intended for this inquiry. The final usable sample size comprised 144 respondents.

To test for non-response bias (per Armstrong & Overton, 1977), we compared the set of early respondents (those being the first one-third of the collected data) with the set of late respondents (those being the last one-third of the collected data) on certain key empirical indicators, on couple of the key modeled constructs, and on the sample's characteristic nominal variables like IT-user role and IT-user support medium. Since no statistically significant differences were found in these tests, it is noted that discernable issue of non-response bias does not appear in the data.

Since the data for all the predictor variables and the criterion dependent variable were naturally collected from the same sample using the same survey instrument and measures, a potential for common methods bias could arise. To assess the viability of this issue, we performed Harmon's one-factor test on the items in the dataset (per Podsakoff & Organ, 1986). The principal components type factor analysis revealed multiple factors with eigen values greater than 1.0 and

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these accounted for about 65% of the total variance. Seeing the fact that several factors emerged from the principal components analysis and that the first factor accounted for only about 29% of the total variance, it is noted that common methods bias does not appear to exist in the data.

The constructs of the research model were subject to factor analysis techniques to determine their convergent and discriminant validity, thereby validating the measures. The procedure respectively included within-factors type factor analysis as well as between-factors type factor analysis to ascertain and establish the unidimensionality of each of the constructs. Then, the measurement scales for all these constructs were tested for their internal consistency through reliability analysis. Thereupon, the hypothesized nomological relationships between the continuous explanans and the main explanandum constituting the formulation of the empirical model were tested via respective multiple regressions. Furthermore, varied group differences tests were conducted to determine the nature and extent of discernable effects exerted by constituent roles of the concerted parameters.

Factor Analyses and Reliability Analyses for the Constructs

Exploratory factor analysis via principal components factoring as well as principal axis factoring techniques was conducted for each of the five reflective constructs (namely UTPA, UTCP, ITOA, ITSS, ITFA) which composed our model. The empirical indicators for each construct loaded strongly (reasonably okay for some items) onto their respective construct, as shown in Table I. Thus, these items did adequately represent and measure the underlying conceptual domain of their respective construct, thereby establishing good convergent validity for each construct. Loadings below 0.4 were suppressed throughout, to view a cleaner loadings' structure.
Thereafter, Principal Axis Factoring with Direct Oblimin Rotation was conducted on the data set for these five constructs' measures held together. The Kaizer-Meyer-Olkin (KMO) Measure of Sampling Adequacy values were considerably high in all cases, and the Bartlett's Test of Sphericity was also found significant in all cases, signaling suitability of factor analytic procedures on the data (Tabachnick and Fidell, 2001). The pattern matrix, shown in Table II, yielded rather intriguing results for the factor analysis conducted between the five constructs' items all together. Though it resulted in a segregated loadings' structure wherein the indicators loaded mainly on their respective constructs, all the measures for constructs UTPA and UTCP loaded together onto a single factor while all the measures for constructs ITSS and ITFA loaded together onto a single factor; the measures of ITOA distinctly loaded onto their own factor. This statistical bearing from the factor analysis stood to substantively reason that the UTPA and UTCP constructs, which together contextually represented the technology associated process and systems prerogatives driving user behavior in the IT utilization environment, were congregating onto a higher-level construct, per Factor 2 in Table II, which we named as combined construct "UTPAC" to describe users' technology affiliation dimensions. Similarly stood to reason that the ITSS and ITFA constructs, which together contextually represented the IT department's deliverables and service scape parameters, were congregating onto a higher-level construct, per Factor 1 in Table II, which we named as combined construct "ITSFA" to describe IT staff and functions' services. Comparing the loadings' pattern between these higher-order emergent factors 1, 2, and 3, no noticeable cross-loadings emerged, thereby establishing concrete discriminant validity for the constructs.

Table I: Factor Matrices for Constructs' Empirical Measures per respective Factor Analyses

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Construct "UTPA" Measures	Factor Loadings
UTPA 2	.799
UTPA 1	.740
UTPA 3	.573
UTPA 4	.522

Construct "UTCP" Measures	Factor Loadings
UTCP 4	.740
UTCP 3	.728
UTCP 2	.670
UTCP 1	.664

Construct "ITOA" Measures	Factor Loadings
ITOA 3	.843
ITOA 4	.823
ITOA 1	.743
ITOA 5	.734
ITOA 2	.697

Construct "ITSS" Measures	Factor Loadings
ITSS 1	.874
ITSS 3	.831
ITSS 4	.794
ITSS 2	.787

Construct "ITFA" Measures	Factor Loadings
ITFA 3	.932
ITFA 7	.896
ITFA 2	.855
ITFA 1	.846
ITFA 6	.759
ITFA 4	.691
ITFA 5	.634

Table II: Pattern Matrix of the final Factor Analysis among the 'yielded' Constructs

Items/Measures of the Respective Constructs	Factor Loadings of the Empirical Indicators per their respectively 'yielded' Constructs		
	Factor 1 ["ITSFA"]	Factor 2 ["UTPAC"]	Factor 3 ["ITOA"]
ITFA 3	.997		
ITFA 2	.940		
ITFA 1	.927		
ITFA 7	.819		
ITSS 1	.769		
ITSS 2	.705		
ITSS 3	.629		
ITFA 6	.583		
ITFA 4	.577		
ITFA 5	.538		
ITSS 4	.443		
UTPA 2		.704	
UTPA 1		.700	
UTPA 3		.683	
UTCP 3		.662	
UTCP 4		.639	
UTCP 1		.523	
UTCP 2		.456	

UTPA 4		.401	
ITOA 4			.814
ITOA 3			.795
ITOA 1			.656
ITOA 5			.594
ITOA 2			.530

Reliability analysis was then performed on each of the five constructs (UTPA, UTCP, ITOA, ITSS, ITFA) as well as on the two emergent higher-order constructs (UTPAC, ITSFA) to test for their internal consistency. Table III summarizes the Cronbach's Alpha reliability coefficients for each construct. The high Alpha values (greater than 0.7; per Nunnally & Bernstein, 1994), indicate that internal consistency of the factors is high; thereby all items measuring their respective construct do homogeneously belong to that construct. Thus, the main five constructs in the model represent strong measures, and the two yielded higher-order combined constructs also substantively represent collective domains' internal consistency.

Table III: Reliabilities of the Constructs

Constructs	Cronbach Alpha
"UTPA" User's Technology Process Awareness	0.746
"UTCP" User's Technology Capability Proclivity	0.790
"UTPAC" (combined construct) User's Technology Affiliation	0.858
"ITSS" IT Staff Support Services Structures	0.927
"ITFA" IT Functions Services Abilities	0.891
"ITSFA" (combined construct) IT Staff & Functions Services	0.952
"ITOA" IT Operations' User Attributes	0.871

Hypotheses Testing and Discussion of the Results

After having established the validity and reliability of the measures, the hypotheses posited in the study were tested using the multiple regression technique. For the statistical estimation purpose of generating robust construct measures yielded by accounting for how the respective indicators loaded in strength on their constructs, we decided to utilize the computed factor scores for each construct from their respective factor analyses runs to represent the finalized constructs' composite scores, instead of simply doing the summed averages of respective item-measures. The standardized beta coefficients, t-statistics, and sig-values were examined (Hair et. al., 2006) to ascertain the statistical significance of the explanans in the regressions toward affecting the explanandum i.e., "IntUS" internal user satisfaction with provided IT services.

Table IV displays the results of the multiple regression with the model's five main explanans constituting the independent variables set.

Table IV: Regression – Dependent Variable "IntUS" Internal User Satisfaction with Provided IT Services [Model F-value 99.182 *; Model R-square 0.782]

(coefficients' effects statistically significant at *5% and **10% levels of significance)

Independent Variables	Stdzd. β	t - value	Sig.	VIF
"UTPA" User's Technology Process Awareness	.025	.465	.643	1.862
"UTCP" User's Technology Capability Proclivity	-.071	-1.159	.249	2.386
"ITOA" IT Operations' User Attributes	.209 *	3.716 *	.001	2.002
"ITSS" IT Staff Support Services Structures	.302 *	3.504 *	.001	4.697
"ITFA" IT Functions Services Abilities	.486 *	6.118 *	.001	4.002

Table V displays the results of the multiple regression conducted, in line with the final factor analyses findings, using the three emergent higher-order constructs modeled as explanans in the independent variables set.

Table V: Regression – Dependent Variable "IntUS" Internal User Satisfaction with Provided IT Services [Model F-value 164.22 *; Model R-square 0.779]
(coefficients' effects statistically significant at *5% and **10% levels of significance)

Independent Variables	Stdzd. β	t - value	Sig.	VIF
"UTPAC" User's Technology Affiliation	-.052	-1.015	.312	1.682
"ITOA" IT Operations' User Attributes	.203 *	3.717 *	.001	1.894
"ITSFA" IT Staff & Functions Services	.766 *	13.163 *	.001	2.145

In both regressions, the Model F values were respectively 99.182 and 164.22, and statistically significant at 5% level, thereby exhibiting good model fit with the data.
The R-square values were 0.782 and 0.779; thereby the modeled set of independent variables respectively helped explain 78.2% and 77.9% of the variance in the dependent variable.
In both regressions, the collinearity diagnostics were examined. For each of the independent variables, the Variance Inflation Factor (VIF) being lower than 5, and their correspondingly high Tolerance values concluded that these variables did not exhibit issues of multicollinearity (Pedhazur & Schmelkin, 1991). This further supported the discriminant validity of the constructs.

In terms of their explanatory impact and predictive ability on the IntUS dependent, the pattern of significant coefficients in both regressions reveals that the IT staff and functions' services parameters (ITFA and ITSS; ITSFA) bear strongest impacts on internal user satisfaction, followed closely by the IT operations' user attributes (ITOA). In both regressions, the users' technology affiliation dimensions (UTPA and UTPC; UTPAC) failed to exert any significant impact on IntUS. Thereby, the results were empirically found to be in support of hypotheses 3, 4, and 5, and not in favor of hypotheses 1 and 2.
These results lend partial support to our research conjecture of the modeled determinants of internal user satisfaction with provided IT services, whereby only the internal IT service providers' dimensions and technology operations' user elements influence user satisfaction while users' technology proclivities related variables show no effect whatsoever.

Group Differences Tests and Discussion of the Results

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Considering each of the five main modeled independent variables as effect-bearing explanans, a corollary objective proceeded to explore each of their impacts on the dependent in a grouping mode whereby each explanans's differential effect generated via high and low grouping be observed in terms of potential group differences. Accordingly, each of these five original continuous interval scale variables is configured computationally as a categorical variable by splitting it along its cut-point median value to generate a 'Level 1' group representing respondents with higher scores (above the median) of that variable and 'Level 2' group representing respondents with lower scores (below the median) of that variable. Thereupon, an independent samples T-test is conducted to examine the differences between these two grouped levels for each of the five categorically generated variables on the IntUS dependent variable. The results are shown in Table VI.

Table VI: Independent Samples T-tests [Cut-Point Method] – Key Continuous Variable "IntUS" Internal User Satisfaction with Provided IT Services by 'Generated' Categorical Factors (group-differences' statistically significant at *5% and **10% levels of significance)

Key Continuous Variable	'Generated' Cut-Point [at Median] Categorical Factor: Grouping by Factor-levels 1 & 2	Group Mean: level 1	Group Mean: level 2	T-value	Sig.
"IntUS"	"UTPA" User's Technology Process Awareness [Median .13138]	4.58	4.03	4.401 *	.001
"IntUS"	"UTCP" User's Technology Capability Proclivity [Median .14916]	4.66	4.01	5.303 *	.001
"IntUS"	"ITOA" IT Operations' User Attributes [Median -.03610]	4.86	3.88	9.800 *	.001
"IntUS"	"ITSS" IT Staff Support Services Structures [Median .12885]	4.88	3.74	12.024 *	.001
"IntUS"	"ITFA" IT Functions Services Abilities [Median .26235]	4.88	3.74	12.024 *	.001

For each of the five independents (UTPA, UTCP, ITOA, ITSS, ITFA), their categorically generated group-levels 1 and 2 do land up with statistically significant group differences on account of the significant t-values, thereby discerning the impacts borne by the higher levels, contrasted with its lower levels, of each independent predictor's influence on the dependent. When comparing the magnitude of these group-differences, the numeric-spatial gap between the resultant group-levels' means reveals ITSS, ITFA, and ITOA in that order to bear highest differences-between-groups, followed by UTCP and UTPA.

Substantively interpreting these results yields to reason that the higher levels (as signaled by significant group differences and further apart means between the groups) of the IT staff and functions' services parameters and the IT operations' user attributes reflect in discernably greater internal IT user satisfaction. Also, the users' technology affiliation dimensions do show higher levels affecting greater user satisfaction; though, the gap between the high and low levels while statistically significant is less discernable substantively speaking. These findings align holistically

with the more robust results of the regressions whereby IntUS is mainly affected by ITSS, ITFA, and ITOA, while not affected by UTCP and UTPA.

The differences between groups of users per their chosen response on categorical variable "Medium", regarding their overall user satisfaction with provided IT services as well as all the modeled predictor variables defining the firm's rendered IT service environment, were tested by analysis of variance (One-Way Anova) runs. The results are shown in Table VII. The only significant effect of medium was found on continuous variable UTPA wherein the statistically significant group-difference conveyed that users' technology process awareness does differ depending on the medium they choose to resort to when needing to resolve IT issues, problems, requests, and applications' support on software and hardware queries. Specifically, among the medium variable's nominal categories, UTPA's higher mean score for medium group/level 2 compared to medium group/level 1 shows that users' awareness of the processes to follow for accessing IT services and systems in operational functioning and resolution modes is greater when they utilize IT support via the firm's web/online helpdesk channels in comparison to the firm's email/helpline channels. Beyond UTPA, no other predictor variable (i.e., the other constructs as well as the two higher-order constructs; all being continuous scaled variables) exhibited significant group differences; also, the overall user satisfaction with IT services (IntUS) showed no significant group difference. Thereby, the remaining findings conveyed that the IT support medium typically adopted by internal users for varied technology support purposes exerted no effect on users' IT service environment variables as well as on their overall user satisfaction.

Table VII: Analyses of Variances – Continuous Variables by Categorical Factor "Medium" (group-differences' statistically significant at *5% and **10% levels of significance)

Continuous Descriptors: Grouping by Factor-levels 1 & 2 [Full Sample Size 144]	Medium – Group Mean: level 1 [Group 1 Size: 66]	Medium – Group Mean: level 2 [Group 2 Size: 78]	F-value	Sig.
"IntUS" Internal User Satisfaction with IT Services	4.27	4.33	.202	.654
"UTPA" User's Technology Process Awareness	-.1427088	.1207536	3.179**	.077
"UTCP" User's Technology Capability Proclivity	-.0030112	.0025480	.001	.970
"ITOA" IT Operations' User Attributes	-.0398666	.0337333	.217	.642
"ITSS" IT Staff Support Services Structures	.1111171	-.0940221	1.681	.197
"ITFA" IT Functions Services Abilities	.0467286	-.0395396	.279	.598
"UTPAC" User's Technology Affiliation	-.0633770	.0536267	.563	.454
"ITSFA" IT Staff & Functions Services	.0782246	-.0661901	.777	.380

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The differences between groups of users per their chosen response on categorical variable "Role", regarding their overall user satisfaction with provided IT services as well as all the modeled predictor variables defining the firm's rendered IT service environment, were tested by analysis of variance (One-Way Anova) runs. The results are shown in Table VIII. None of the predictor variables (i.e., the five main constructs as well as the two higher-order constructs; all being continuous scaled variables) exhibited significant group-differences on the nominal role variable; also, the overall user satisfaction with IT services (IntUS) showed no significant group-difference on role. Thereby, the findings conveyed that internal users' role/designation within the firm's hierarchy exerted no effect on users' IT service environment variables as well as on their overall user satisfaction. Hence, IT users being classified as either managerial/supervisory employees or operations/administrative/support/sales in their operating role within the institution pointed to no discernable difference in their overall IT services' user satisfaction or in their evaluations of the other modeled IT services parameters.

Table VIII: Analyses of Variances – Continuous Variables by Categorical Factor "Role" (group-differences' statistically significant at *5% and **10% levels of significance)

Continuous Descriptors: Grouping by Factor-levels 1 & 2 [Full Sample Size 144]	Role – Group Mean: level 1 [Group 1 Size: 68]	Role – Group Mean: level 2 [Group 2 Size: 76]	F-value	Sig.
"IntUS" Internal User Satisfaction with IT Services	4.26	4.34	.331	.566
"UTPA" User's Technology Process Awareness	.0140522	-.0125730	.032	.859
"UTCP" User's Technology Capability Proclivity	.1012978	-.0906349	1.666	.199
"ITOA" IT Operations' User Attributes	.0358347	-.0320626	.185	.668
"ITSS" IT Staff Support Services Structures	.0267892	-.0239693	.102	.750
"ITFA" IT Functions Services Abilities	-.0786055	.0703313	.839	.361
"UTPAC" User's Technology Affiliation	.0648713	-.0580427	.624	.431
"ITSFA" IT Staff & Functions Services	-.0342684	.0306612	.157	.693

Having ascertained the lacking group-differences among users of IT services per the Anovas' testing with each categorical variable, by medium and by role, the forethought becomes rather intriguing to assess whether the combination of these categorical variables as more complete descriptive classifiers of the organizational user's status would potentially yield any noteworthy group-differences. From a practical standpoint too, an IT user's role and medium interplay as categorical explanans fully explain in nominal mode the operating status of that user in the firm's

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hierarchy in conjunction with the channel typically adopted by that user for IT support purposes. For each such user of IT services as the sample respondent in the data set to be categorized by the role and medium combination makes for a more defined user profile to be subject to multivariate testing for group-differences on the varied empirical IT service environment parameters. Thereby, the differences between groups of users per their chosen response on categorical variables "Medium" and "Role" regarding their overall user satisfaction with provided IT services as well as the modeled predictor variables defining the firm's rendered IT service environment, were tested by two-way analyses of variance (2-Way Anova) runs. The results are shown in Table IX.

Table IX: Analyses of Variances 2-Ways – Continuous Variables by Categorical Factors' "Medium * Role" Interaction Effects
(group-differences' statistically significant at *5% and **10% levels of significance)

"IntUS" Internal User Satisfaction with IT Services		Estimated Marginal Means for the Medium * Role Interaction		Medium * Role Interaction: F-value 1.859 Sig. .175
		Role Group 1	Role Group 2	
	Medium Group 1	4.171	4.440	
	Medium Group 2	4.407	4.294	
"UTPA" User's Technology Process Awareness		Estimated Marginal Means for the Medium * Role Interaction		Medium * Role Interaction: F-value .409 Sig. .523
		Role Group 1	Role Group 2	
	Medium Group 1	-.142	-.144	
	Medium Group 2	.251	.052	
"UTCP" User's Technology Capability Proclivity		Estimated Marginal Means for the Medium * Role Interaction		Medium * Role Interaction: F-value .044 Sig. .833
		Role Group 1	Role Group 2	
	Medium Group 1	.089	-.155	
	Medium Group 2	.119	-.059	
"ITOA" IT Operations' User Attributes		Estimated Marginal Means for the Medium * Role Interaction		Medium * Role Interaction: F-value .735 Sig. .393
		Role Group 1	Role Group 2	
	Medium Group 1	-.061	-.006	
	Medium Group 2	.183	-.045	
"ITSS" IT Staff Support Services Structures		Estimated Marginal Means for the Medium * Role Interaction		Medium * Role Interaction: F-value 1.796 Sig. .182
		Role Group 1	Role Group 2	
	Medium Group 1	.020	.261	
	Medium Group 2	.037	-.163	

"ITFA" IT Functions Services Abilities		Estimated Marginal Means for the Medium * Role Interaction		Medium * Role Interaction: F-value 1.236 Sig. .268
		Role Group 1	Role Group 2	
	Medium Group 1	-.100	.287	
	Medium Group 2	-.046	.036	
"UTPAC" User's Technology Affiliation		Estimated Marginal Means for the Medium * Role Interaction		Medium * Role Interaction: F-value .046 Sig. .830
		Role Group 1	Role Group 2	
	Medium Group 1	-.014	-.144	
	Medium Group 2	.185	-.016	
"ITSFA" IT Staff & Functions Services		Estimated Marginal Means for the Medium * Role Interaction		Medium * Role Interaction: F-value 1.516 Sig. .220
		Role Group 1	Role Group 2	
	Medium Group 1	-.049	.287	
	Medium Group 2	-.012	-.095	

In each of the 2-Way Anova tests, examining the statistical significance of the nominal interaction effect term (Medium * Role) becomes most pertinent toward gauging the impact borne by these two categorical variables held in tandem on each of the continuous variables as dependent in their respective run. In accordance with the significance check of the interaction effect (Medium * Role) plays the inspection of the estimated marginal means, computed along the four cells yielded by the medium and role combinations, for each of the continuous variables (detailed results shown in Table IX). Each estimated marginal mean shows the parameter value of that continuous IT services'-oriented model-variable resulting from its respective cell's combination of that respondent's medium and role declarations. Comparing these means among the four cells on their magnitudes makes for a collective judgment of the impact of role and medium on the continuous variables. As Table IX demonstrates, none of the continuous scale predictor variables (i.e., the five main constructs as well as the two higher-order constructs) exhibited significant group-differences for the nominal variables' interaction (Medium * Role); also, the overall user satisfaction with IT services (IntUS) showed no significant group-difference for the nominal variables' interaction (Medium * Role). Thereby, the findings conveyed that IT users being classified as either managerial/supervisory employees or operations/administrative/support/sales personnel in their operating role within the institution and their preference for IT services support channel being either email/helpline or web/online helpdesk pointed to no discernable difference in their overall IT services' user satisfaction or in their evaluations of the other modeled IT services parameters.

Limitations and Future Research

The IT services attributes being evaluated as empirical measures in this research design pertain to the intraorganizational functioning environment, and the respondents too are internal users of these IT services. So, it is genuinely plausible for auspices bias to arise as constituents within collegial confines of the system would tend toward naturally supportive opinionating of service delivery in

performance appreciation when answering those IT support staff abilities and assistive structures related items on the survey. Potential for respondent bias could exist given that individual employees as involved IT users may perhaps engage in introspective reasoning when answering those user pertinent technology awareness capabilities and proclivities related items on the survey. The modeled variables and measures pertain to the operational parameters of IT services within the firm's environment, thereby applying the scope of findings to mainly firms of such governance. Since this paper has conducted more of a descriptive diagnostic testing approach to the modeled parameters using those suited multivariate techniques, the next appropriate methodology to follow will be more confirmatory in nature to better substantiate the model. Further inquiry into this research domain will need to expand the sampling frame to multiple firms which would be representative of this IT service scape. It is though imperative to note that the presently themed contextual empirical formulation of the measures and scales would need to be reframed and adapted toward a more generalizable platform of firms' internal IT services delivery.

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