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# Evaluating Organizational Level IT Innovation Adoption Factors among Global Firms

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A B S T R A C T

This study explores a range of organizational factors that drive success in organizational level information technology (IT) innovation adoption. A comprehensive model of organizational level IT innovation adoption is presented based on a context-mechanism-outcome perspective and by drawing on relevant theories. The proposed model is empirically tested using data from 1988 company executives across a wide range of organizations globally. A research model and the related hypotheses are tested using structural equation modelling. The study found that organizational level IT innovation readiness conceptualized through technology readiness and internal expertise is a key mediator for successful organizational level technology adoption. Other organizational factors such as top management support, organizational structure, and organization culture, were positively related to the overall level of IT innovation readiness and organizational level technology adoption. Considering that there are many organizational factors that influence the adoption of technology, future research should extend the research framework and include additional variables that could support IT innovation adoption outcomes. The study makes a significant contribution to the existing literature by providing empirical evidence related to the organizational factors necessary for a successful IT innovation adoption at an organizational level.


## Introduction

This study aims to explore the organizational and information technology (IT) readiness factors that best facilitate the successful adoption of IT at the organization level. Given that 80% to 90% of technology adoption projects fail to achieve their performance goals (Mabad et al., 2021), the need to understand which organizational and readiness factors are more germane for successful IT adoption has never been more important. Successful adoption of new IT is now regarded as a key competitive advantage for many organizations (Chen & Tsou, 2007; Chiu & Yang, 2019; Gunasekaran, Subramanian & Papadopoulos, 2017), yet organizations continue to pay lip service to IT readiness factors (Lynn et al., 2018). Much of this contradiction could be attributed to the lack of understanding related to the organizational factors involved in adopting emerging IT especially, when such factors are equivocal and ambiguous (Kamal, 2006). Although human and more general organizational factors e.g., organization size, have been found to be important determinants of adoption of new IT systems (Bruque-Cámara, Vargas-Sánchez & Hernández-Ortiz, 2004; Oliveira & Martins, 2011), managers typically struggle to grasp how new technological breakthroughs can be adopted to address organizational problems and needs (Mabad et al., 2021, Lynn et al, 2018). Surprisingly, scholars suggest that many organizations are in no rush to embrace new technologies due to the risks involved even while IT innovations offer significant benefits towards achieving company goals (Skiti, 2020; Oliveira et al., 2014).

Given the range of prior study findings and uncertainty related to IT innovation adoption success, particularly the uncertainty of the effects of organizational factors, this study presents a competing perspective by bridging conversations at the organizational level. With some exceptions, extant research thus far has tended to focus more on IT adoption at an individual level than at the

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organizational level (Oliveira et al., 2014) despite IT adoption success significantly influencing firm performance (Skiti, 2020; Oliveira et al., 2014). There is a growing gap between the more one-off organizational factors required for IT innovation adoption success such as organizational size, and a more comprehensive model of organizational factors required for successful IT innovation adoption. For instance, the factors that might affect technology adoption success such as top management support (TMS), organization size, culture, technical expertise, and technological readiness, are often not considered in tandem meaning that an important research divergence has not yet been explored. Scholars more generally note the importance of specific organizational and IT readiness factors. Chen et al. (2015) points to the importance of understanding how big data analytics influences organizational performance but explain that this is less likely to occur without uncovering the hidden patterns and unknown correlations that underpin organizational adoption intentions. Karunagaran et al. (2019) found that there was a lack of compatibility, technological integration, and regulatory support for the adoption of cloud computing based on firm size, while online security performance studies have found that the technology-organization-environment (TOE) framework was seldom used to measure implementation of technologies related to security threats or protective IT (Li, 2015). Accordingly, complementary to the organizational and IT readiness factors that scholars have explored, this is the first study to examine the effects on adoption success with a more comprehensive view of organizational and readiness factors that may be important in the organizational level IT innovation adoption context. As a result, the study seeks to make a revelatory advancement to scientific knowledge by broadening scholarly understanding of IT innovation adoption success when considering a wider range of organization and IT readiness factors.

The paper is structured as follows. We first examine the theoretical framework on which organizational level IT innovation adoption may be viewed. Second, we draw on relevant literature to formulate several hypotheses related to the research model to be tested. Third, the methodology is outlined, followed by the results of the analysis. Subsequently, the discussions and conclusion sections highlight the contributions to theory particularly how the results extend the literature related to the organizational factors that enable successful adoption of IT at the organization level. To conclude, the limitations are outlined together with implications for practice and directions for future research.

## Theoretical Framework

The emerging nature of IT at an organizational level can be viewed from a general or specific innovation adoption perspective (Skare & Soriano, 2021). Several theoretical perspectives are dominant in the literature related to these two approaches (Ali & Soar, 2016). At an organizational level, Wisdom et al. (2014) suggest that constructs may be focused on the adoption process or on the various stages of implementation, diffusion, dissemination, and sustainability of innovation. Innovation adoption can also be viewed in stages of pre-adoption and actual adoption, where a certain amount of readiness is required before the actual adoption of innovation occurs (Hameed et al., 2012; Wisdom et al., 2014). While it is possible to evaluate innovation adoption at multiple levels, an appropriate 'level' theory is required to better understand adoption at an organizational level. This approach is referred to as a *middle-range theory* (Eisenhardt & Bourgeois, 1988; Wong et al., 2010). To focus on the organizational level factors that influence the adoption of IT, this study draws on several widely used theories to arrive at a *middle-range theory* to present an appropriate conceptual framework.

To evaluate organizational level innovation adoption, the diffusion of innovation (DOI) (Rogers, 1995) and technology-organization-environment (TOE) (Tornatzky & Fleischer, 1990) frameworks are most common (Ali et al., 2020; Senyo et al., 2018). Institutional theory (Scott & Christensen, 1995; Scott, 2001) has also been used to emphasize the social and cultural effects in the adoption context (Arpaci et al., 2012). The technological dimension in TOE for instance focuses on both internal technological characteristics and the external technological environment. In this study, since the focus is on identifying the organizational factors related to IT adoption, only the internal technological characteristics are considered. Influential organizational factors are also important from the perspective of DOI. While DOI points to some of the organizational elements that may be important in the adoption of innovative ITs, organizational readiness is often omitted in the actual adoption process. In this study, both technological readiness and internal technological expertise both account for the technological factors relevant at the organizational level similar to earlier adoption studies (Iacovou et al., 1995). The proposed model in Figure 1 presents IT innovation readiness, comprising of technology readiness and internal expertise, as mediating the relationship between organizational factors and IT adoption. This approach has not been considered in extant empirical studies presenting an opportunity to extend scholarly literature on IT innovation adoption. Other organizational factors important within the context

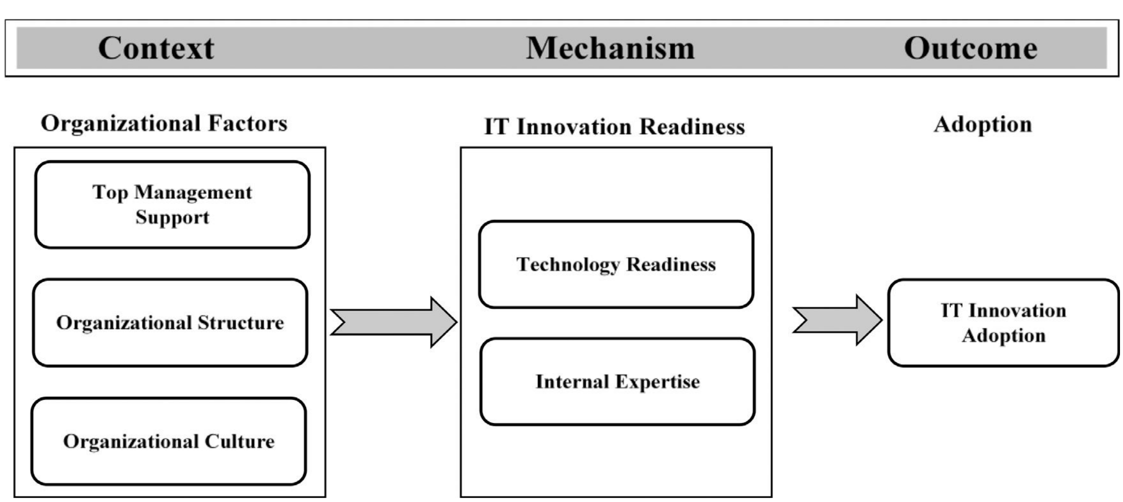


**Figure 1.** Theoretical framework of organizational factors in organizational IT innovation adoption

**Table 1**
Literature related to the theoretical framework.

| Category | Sub-Category | Factor | Source |
|---|---|---|---|
| **Organizational Factors** | Top Management Support | Executive support | Şener et al. (2016); Senyo et al. (2016); Ali et al. (2018); Ren (2019); Ali et al. (2020). |
| | | Management intention | Qian et al. (2016); Şener et al. (2016); Lynn et al. (2018); Ali et al. (2018); Sadoughi et al. (2020); Ali et al. (2020). |
| | Organization Structure | Size | Nkhoma and Dang (2013); Ali et al. (2018); Ali et al. (2020); Mabad et al. (2021). |
| | | Managerial structure | Kinuthia (2015); Martins et al. (2015); Wilson et al. (2015); Al-Momani et al. (2018); Ren (2019); Aslam et al. (2021). |
| | | Degree of centralization | Oliveira et al. (2014); Wilson et al. (2015); Al-Mascati and Al-Badi (2016). |
| | Organization Culture | Technology use attitude | Alkhater et al. (2015); Alharbi et al. (2016); Sabi et al. (2016). |
| | | Change attitude | Safari et al. (2015); Gangwar et al. (2015); Das and Dayal (2016); Reginato et al. (2016). |
| | | Awareness | Siren and Knudsen (2017); Hamad et al. (2018); Berkowsky et al. (2017); Ren (2019); Sadoughi et al. (2020). |
| **IT Innovation Readiness** | Technology Readiness | Organization's resource | Al-Mascati and Al-Badi (2016); Fu and Chang (2016); van de Weerd et al. (2016); Ali and Shrestha (2017); Lynn et al. (2018). |
| | | IT infrastructure | Ali et al. (2015); Gutierrez et al. (2015); Senyo et al. (2016); Lynn et al. (2018); Sadoughi et al. (2020). |
| | | Organizational systems | Kinuthia (2015); Das and Dayal (2016); Schiavi and Behr (2018). |
| | | IT budget | Ghobakhloo et al. (2011); Osyk et al. (2012); Marten and Teuteberg (2012); Reyes et al. (2016); Ali and Shrestha (2017). |
| | Internal Expertise | Employee IT knowledge | Lian et al. (2014); Wilson et al. (2015); Jha and Bose (2016); Ali et al. (2018); Ali et al. (2020). |
| | | IT expertise | Lian et al. (2014); Gangwar et al. (2014); Martins et al. (2016); Lynn et al. (2018); Sadoughi et al. (2020). |
| | | Technical competence | Gangwar et al. (2014); Wilson et al. (2015); Alharbi et al. (2016); Fu and Chang (2016); Lynn et al. (2018). |
| **External Factors** | | Business Requirement | Polyviou and Pouloudi (2015); Alemeye and Getahun (2015); Ali et al. (2015); Das and Dayal (2016); Fu et al. (2016). |
| | | Information Intensity | Hsu et al. (2014); Wilson et al. (2015); Ali et al. (2018); Ali et al. (2020), Mabad et al. (2021). |

of this research are *top management support* (TMS) (Ali et al., 2018; Ren, 2019; Ali et al., 2020), *organizational structure* (Nkhoma & Dang, 2013; Ali et al., 2018), and *organizational culture* (Gupta et al., 2019; Davis et al., 1989). The importance and differential effects of these factors in Figure 1 are highlighted immediately below.

While a majority of extant research has focused on innovation frameworks unique to specific contexts, this study adopts a context-mechanism-outcome (CMO) perspective (Wisdom et al., 2014) since CMO is broad enough to be applicable within a general context that can measure differential organizational effects. Here, organizational factors represent the context that influences organizational strategy and subsequent adoption of the innovative IT as the final outcome. Hence, TMS, organizational structure and organizational culture are considered as the key organizational factors that drive IT innovation adoption, while technology readiness (TR) and internal expertise specifically IT knowledge represents the overall *readiness* mechanisms influencing successful IT innovation adoption. These two factors form the overall IT innovation readiness of the organization and is posited as the mechanism that connects the context with the outcome. *Technology readiness* relates to building the right level of technological capability prior to the actual adoption process (Webster and Gardner, 2019). *Internal expertise* represents the nature of collaboration between IT professionals and other workers and captures the overall knowledge base essential for successful IT adoption (Gangwar et al., 2014). In addition to the factors related to CMO, this study also considers the degree of *business requirements* and *information intensity* of the industry as an important external factor that could influence IT innovation adoption in organizations (Ali, et al., 2020; Das & Dayal, 2016; Fu et al., 2016; Hastig & Sodhi, 2020; Hsu et al., 2014; Jüttner, 2005; Wilson et al., 2015). Articles finally retained that were considered to be relevant to the proposed conceptual model are presented in Table 1. This table identifies the main categories, sub-categories and their factors and sources.

Figure 1 presents the overall organizational-level IT innovation adoption framework to be explored in this study. The next section details the development of the specific hypotheses used to test the relationships in the framework.

*Hypotheses development*

*Top Management Support (H1)*

According to Premkumar (2003) and Hsu et al. (2019), TMS concerns the magnitude of dedication and resource support provided by top management in support of new technology adoption. Studies have found that top management awareness of the importance of adopting cloud computing - as an example of new technology– helps to tie supportive organizational change processes with top management expressions of commitment to the change (Low et al., 2011). Senior managers play an important role as the implementation of cloud computing may involve integration of resources and activities and the reengineering of certain processes. Given a range of organization factor variables mostly likely to influence technology adoption, studies have noted that top management support (TMS) or top leadership support is positively related to technology adoption (Reyes et al., 2016; Qian et al., 2016). Yet, receiving assistance from top management has been found to be a significant challenge in some studies (Vagnani & Volpe, 2017; Ali et al., 2020), resulting in negative relationships between TMS and technology adoption in others (Lynn et al., 2018; Gutierrez et al., 2015). TMS is not limited to just financial assistance. Rather, TMS concerns releasing human resources and encouraging technological proficiency and internal expertise (Hassan et al., 2017; Villaluz & Hechanova, 2019). H1a Top management support has a positive influence on technological readiness. H1b Top management support has a positive influence on internal expertise.

*Organization Structure (H2)*

In assessing the organizational structure factor, we include three key aspects namely, organization size, managerial structure, and degree of centralization. Organization size can be considered one of the main factors determining the adoption of new technology (Drnevich & West, 2021; Ali et al., 2020; Barham et al., 2020). According to scholars, and contingent on access to resources, large organizations have an additional leverage over small organizations and can absorb the risks associated with innovation adoption (Molinillo &

Japutra, 2017). Some studies suggest that small organizations, although diverse and dynamic, may not have the capacity to adopt new technology (Low et al., 2011; Mathauer & Hofmann, 2019). Yet results are mixed. In a study by Karunagaran et al. (2019) on the adoption of cloud factors based on large and small firms, they found that for large firms there was a lack of regulatory support, technological integration, and compatibility for adopting cloud-based technology. In small firms, by comparison, a positive correlation was found between cloud adoption and compatibility indicating that overall, the advantages and disadvantages of cloud-based factors varied according to firm size. In a comparative study by Ali et al. (2020) of cloud computing within a mid-sized local government setting, the results showed a positive correlation between organization size and the adoption of innovation technology. Conversely, smaller firms have lower levels of bureaucracy and are more flexible and innovative (Gutierrez et al., 2015).

A decentralized structure – as distinct from centralised control - might only be more supportive of readiness factors when underpinned by a culture of fast change towards innovation, of high product visibility, where multiple tasks can be processed in parallel, and where the focus is on shifting responsibility and authority to lower levels of management (Grant et al., 2021: 216), creating increased collaboration and attitudes towards adoption. For instance, Yu and Tao (2009) found in a study of business level technology adoption that organizational attitudes to adoption significantly influenced pre and post adoption decisions. In such circumstances, a decentralised focus should enable managers to adopt and effectively execute complex and sophisticated new technologies (Ali et al., 2018). Hence the management structure combined with the extent to which decisions are centralised will foster more (or less) support for new technology adoption. H2a Organizational structure has a positive influence on technological readiness. H2b Organizational structure has a positive influence on internal expertise.

*Organizational Culture (H3)*

Organizational culture is a critical factor in the adoption of technology in extant research (Berkowsky et al., 2017; Chong et al., 2009). Melitski et al. (2010) suggests that "*organizational cultures shape the way in which organizations choose to use technology*" (p. 546). While many functions of an organization will influence an organization's culture e.g., design of work, decision-making practices, and employee voice through upwards communication (Ruck et al., 2017), the present study focuses on specific technology-related elements of culture such as user attitude to technology, change attitude, and awareness. These dimensions of culture are missing across extant research. A study by Gupta et al. (2019: 22) of agile software development (ASD), particularly how IT department cultural awareness affects the use of social and technical agile practices e.g., agile values, found that ASD practices should reflect new cultural assumptions when IT departments can identify and appropriately manage their cultural transitions involved in the adoption process. Thus, internal expertise, cultural agility, and awareness, are important antecedents to the intention to adopt computer technology (Gupta et al., 2019; Davis, 1989), and in the IT adoption of consumer contexts (Bobbitt & Dabholkar, 2001; Rojas-Méndez et al., 2017). An organizational culture that promotes knowledge sharing among its employees contributes to the development of overall organizational expertise and better utilization of such knowledge (Muhammed & Zaim, 2020; Zaim et al., 2019). Similarly, having an awareness, and an open and positive attitude towards new and emerging technologies enables individuals to be better prepared when organizations consider the adoption process (Siren & Knudsen, 2017; Ren, 2019). H3a A supportive organizational culture will have a significant and positive impact on organization's technology readiness. H3b A supportive organizational culture will have a significant and positive impact on organization's internal expertise.

*Technology Readiness (H4)*

While organizational factors play an important role in facilitating the adoption of new ITs, this is achieved by preparing the organization to be ready to accept new technologies (Shaw, 2012). In assessing readiness for IT adoption, this study focuses on the technological readiness and the internal expertise of the organization both of which are salient aspects of institutional readiness (Webster & Gardner, 2019). Technology readiness is the technological capability present in the organization for the active adoption of any new technology (Oliveira et al., 2014; Nugroho et al., 2017). However, as noted, organizational level technological readiness in the context of IT innovation adoption has not received sufficient attention. Readiness here is the organization's internal technological capability which comprises of the structural features that include the platform, organization system, or technological framework (for instance, installed network technologies and enterprise systems) within the organization, which can be harmonized or substituted by the new technologies (Ali et al., 2020; Oliveira & Martins, 2010). It includes having sufficient resources and budget allocated to IT (Fu & Chang, 2016; Lynn et al., 2018), and availability of the appropriate level of IT infrastructure and organizational systems required for the new technology (Das & Dayal, 2016; Schiavi & Behr, 2018). H4 Technological readiness has a positive influence IT innovation adoption.

*Internal Expertise (H5)*

Internal expertise relates to the specialized human resources present in the organization for assisting in adopting new technology (Sun & Jeyaraj, 2013). Individual-level IT knowledge, skills, abilities, and other capabilities (KSAOs) play a key role in how IT and other cultural routines play out (Murray, 2018). Capabilities that emerge at the organizational level also help support the overall intention and positive attitude towards new technology. The individual-level skills are different to the human capital resource (HCR) held at the organizational level. That is, the organization-level HCR is an aggregate of individual-level skills, and it is the HCR where IT readiness is particularly germane (Murray, 2018; Nyberg et al., 2014). The specialized individual-level human resources assist the organization either with their specific IT skills or by providing necessary acquaintance and expertise to recruit skilled experts such as employees with excellent computer skills (Alshamaila et al., 2012; Lian et al., 2014). Consequently, the recruited IT specialists are the internal experts who implement new technologies (Samaranayake et al., 2017), and help in imparting their expertise to others (Murray, 2018). The organization workforce's collaborative role with IT professionals is essential in adopting novel technology solutions (Gangwar et al., 2014; Lynn et al., 2018). H5 Internal expertise has a positive influence on IT innovation adoption.

*External Factors (H6)*

Many factors external to the organization might also influence the adoption of new technologies and influence an organizations information management capability overall (Ali et al., 2020; Han et al., 2011; Hastig & Sodhi, 2020; Hsu et al., 2014; Jüttner, 2005; Mahdaly & Adeinat, 2022; Wilson et al., 2015). Since the focus of this research is on examining the organizational characteristics that are important in the adoption of innovative IT's, consideration of a comprehensive list of environmental factors in this context is beyond the scope of this research. However, we examined the business requirements and information intensity of the industry as potential moderators in the adoption of innovative IT in organizations since both sub factors influence an organizations information management capability. Several studies have highlighted for instance the importance of these factors in the context of IT innovation adoption. For example, a recent study by Mahdaly and Adeinat (2022), evaluated business environment factors such as competitive and trading partner pressures of the industry and information intensity in the context of RFID

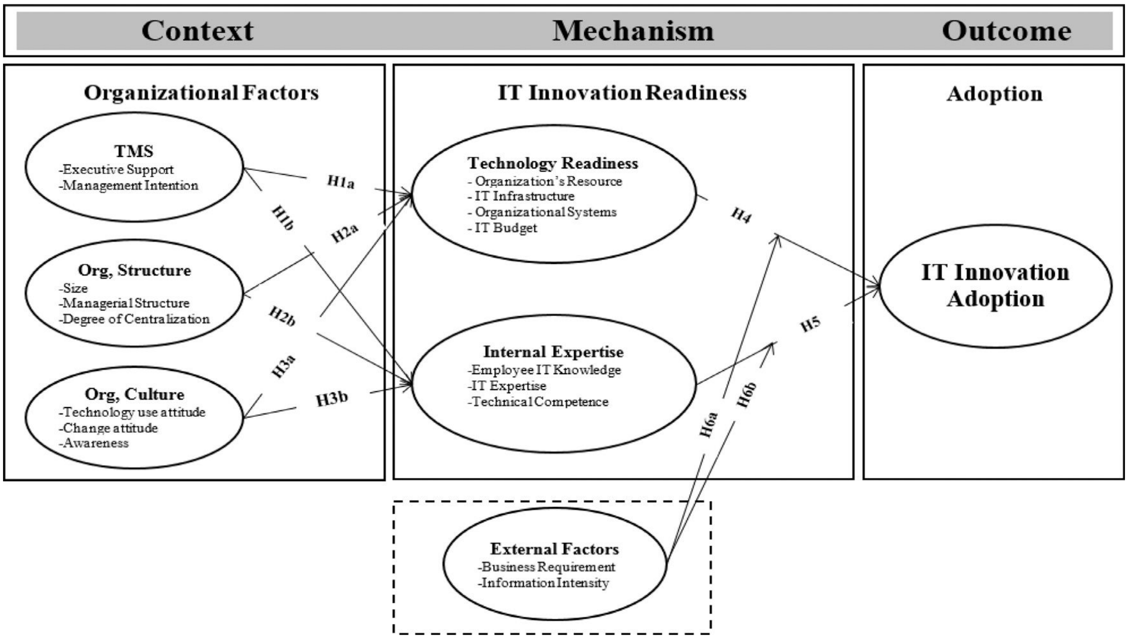


**Figure 2.** Organizational level IT innovation adoption framework

adoption in organizations. Business requirements serve as the ultimate blueprint for the adoption of technology within the organization (Fu et al., 2016). A cumulative understanding of business requirements within the context of an organization's industry environment is important in mitigating the risks associated with the adoption of new technologies (Jüttner, 2005). A better understanding of business needs will help organizations to adopt and use the most appropriate technology (Alemeye & Getahun, 2015). A study by Güner and Sneiders (2014) found that organizations with poorly defined business requirements with respect to technology adoption spend more cost and time per project to adopt new technology. As noted by Zilber and de Araújo (2012), business requirements have influenced organizational growth because organizations need to constantly promote new business frameworks and influence existing ones. According to research conducted by Chau and Tam (1997), Thong (1999) and Chong et al. (2009), organizations with more sophisticated IT systems provide greater access to internal, external, and historically stored data and knowledge (Wilson et al., 2015). Mahdaly and Adeinat (2022) indicate that information intensity of the business environment could have a bearing on the adoption of innovation. Similarly, Information accessibility is also facilitated by information intensity which allows for rapid retrieval of the information (Hsu et al., 2014; Wilson et al., 2015). In another study, Neirotti and Pesce (2018) indicate that organizations in information intensive industries tend to spend higher on ICT adoption. Further, Mao et al. (2015) showed that environmental uncertainty and information intensity moderated the relationship between IT and knowledge capability with organizational agility. Hence, we hypothesize a moderating relationship between these two environmental factors and IT innovation adoption: H6a Business requirements and information intensity moderates the relationship between technology readiness and IT innovation adoption. H6b Business requirements and information intensity moderates the relationship between internal expertise and IT innovation adoption.

To test the proposed hypotheses, a large-scale empirical analysis was conducted. The detailed research model and hypothesized relationships are illustrated in Figure 2.

## Research Method

Surveys are considered flexible and permit respondents to incorporate their knowledge, qualities, and personal experience into their answers (Zikmund et al., 2013; Johnson & Christensen, 2016; Leonard & Robinson, 2018). The main objective of the survey was to analyse the conceptual research framework. A survey based on measures from existing literature on IT adoption was utilized (Beatty et al., 2001; Soliman & Janz, 2004), to explore the hypotheses presented. The survey methodology was chosen due to its resilience, low expenditure, and rapid data gathering option (Fan & Yan, 2010; Zikmund et al., 2012; Fowler, 2014; Gillespie et al., 2015).

The measurement instrument consisted of a seven-point Likert scale for each measure, where '1′ indicated strong disagreement and '7′ strong agreement. Due to the reflective nature of the questions and need for respondent's accurate subjective interpretation of the questionnaire items, a seven-point Likert scale was used (Finstad, 2010). The seven-point Likert scale is considered adequately sensitive to reduce the interpolations and is also sufficiently compacted to respond proficiently. The seven-point Likert scale also provides excellent objective precision and accuracy and is easy to use (Finstad, 2010). The survey was distributed online for ease of access and to reach more people (Callegaro et al., 2015).

A pre-study was executed to examine the survey's design, validity, identify any weaknesses, and enable the researchers to improve its efficiency (Antaya & Parrish, 2014; Leavy, 2017; Waters, 2011; Kothari, 2008; Gillespie et al., 2015; Frey, 2018). Then, a pilot test (discussed next) was conducted initially to refine the measurement instrument followed by a large-scale data online collection for ease of access and to reach more people (Callegaro et al., 2015).

### Pilot Test

To obtain high-quality outcomes, a good research study with relevant tool design and accurate performance is required, since analyzing its feasibility prior to performing the main study can be very beneficial Arnold et al., 2009). A pilot study is the first step of the

**Table 2**
Reliability indicators

| Constructs | Cronbach's Alpha First Round | No. of items | Cronbach's Alpha Second Round | No. of items |
|---|---|---|---|---|
| Executive support | .844 | 6 | .844 | 6 |
| Management Intention | .715 | 5 | .824 | 4 |
| Organization Size | .887 | 5 | .887 | 5 |
| Managerial Structure | .590 | 5 | .798 | 4 |
| Degree of Centralization | .941 | 7 | .941 | 7 |
| Technology User Attitude | .560 | 6 | .754 | 5 |
| Change Attitude | .839 | 5 | .839 | 5 |
| Cultural agility & Awareness | .804 | 6 | .804 | 5 |
| Organization's Resource | .912 | 5 | .912 | 5 |
| IT Infrastructure | .854 | 5 | .854 | 5 |
| Organizational Systems | .537 | 5 | .769 | 4 |
| IT Budget | .943 | 5 | .943 | 5 |
| Employee IT Knowledge | .879 | 5 | .879 | 5 |
| IT Expertise | .922 | 5 | .922 | 5 |
| Technical Competence | .747 | 7 | .898 | 4 |
| Business Requirement | .846 | 4 | .846 | 4 |
| Information Intensity | .899 | 5 | .899 | 5 |
| IT Innovation Adoption | .857 | 5 | .857 | 5 |
| **Total** | | **96** | | **88** |

entire research protocol and is often a smaller-sized study assisting in planning and modification of the main study (Thabane et al., 2010). More specifically, in large-scale studies, the pilot or small-scale study often precedes the main trial to analyze validity. Before a pilot study begins, researchers must fully understand not only the clear purpose and question of the study, but also the methods and schedule. Researchers become aware of the procedures involved in the main study through the pilot study, which aids in the selection of the research method most suitable for answering the research question in the main study (In, 2017).

In this research, a pilot-test was carried out to analyse the survey's design and validity and identify weaknesses to enhance survey performance (Leavy, 2017; Frey, 2018). Reliability based on Cronbach's alpha ($\alpha$) is a measure of internal consistency that demonstrates the extent to which all measurement items on a scale measure one construct (Heale & Twycross, 2015). The value of $\alpha$ is determined through number of quality measurement items in a construct (Tamilmani et al., 2021; Cortina, 1993). Internal consistency is a measure of item-to-item correlation, at least two or more measurement items are required to measure Cronbach's alpha ($\alpha$) for a construct (Heale & Twycross, 2015). The value of Cronbach's alpha ($\alpha$) ranges from 0 to 1, where if the value of $\alpha$ is higher than higher is the reliability of the construct and measurement scale used for the survey (Tamilmani et al., 2021; Santos, 1999).

In this stage, 70 surveys were circulated among various organizations' top management levels in diverse sectors, and 52 survey responses were returned. Cronbach's alpha was utilized to assess the research tool items' trustworthiness based on its conceptual structure (Cozby & Bates, 2012; DeVellis, 2016). As a result, the survey instrument was reduced from 96 to 88 items. Table 1 illustrates the comparison of internal stability using Cronbach's alpha scores. After rectifying the correct scores, the reliability ranged from 0.754 to 0.943, indicating an excellent level of internal consistency for all the measures (Barrett et al., 2014; DeVellis, 2016) (see Table 2).

The research participants were chosen from various organizations with highly developed technologies and diversified segments, including service, education, healthcare, finance, manufacturing, retail, transportation, construction, and agriculture sectors. The study primarily targeted the top management level, head of the department, IT managers, and experts. The rationale was to assess whether these organizations possessed a telecommunication infrastructure foundation to adopt new technologies and reflect on their decision-making regarding organizational level phenomena in respect of adopting novel technology. A link for the survey was provided to each organization's top managers. Using a snowballing approach (Noy, 2007), relevant managers circulated the link among their respective employees. Snowballing enables researchers to access informants through contact information that is provided by other informants. Here, the 'snowball' effect captures the central quality of this sampling procedure and its accumulative dimensions (Noy, 2007: p. 300). The IP addresses of response devices were saved as log information for audit purposes to ensure that no respondent took the anonymous survey more than once.

*Large Scale Data Collection*

An online survey was setup and was made available 24/7 for six months between the periods January 15th to June 14th, 2020, for the large-scale data collection. The survey, circulated to numerous organizations in different sectors, returned 2136 individual responses from different organizations. Then, a preparation stage was applied after collecting the research data (Field, 2013). This step was required to identify data entry errors, missing data and outliers to clean data and conduct the main statistical analysis accurately (Hair et al., 2006). According to Bazeley (2013), preparing data has a direct effect on the analysis results because errors in data, missing data and outliers can have a harmful effect on the statistical analysis and may lead to incorrect findings (Phakiti, 2015; Leavy, 2017).

The research study adopted a series of steps to conduct the data preparation as follows: (1) Checking raw data to ensure it was accurately arranged, uniformly entered and complete (Wilson, 2014), (2) Ensuring data accuracy and quality before data entry into SPSS which included, for instance, searching for illegitimate codes, illogical relationships and testing the basics in filter questions (Tharenou et al., 2007), (3) Numbering the responses and assessing their relevance based on participant qualifications, missing data, and how the questions were answered (Bernard & Bernard, 2013; Watkins & Gioia, 2015), and (4) Coding data by classifying data into a small set of categories (Zikmund et al., 2013; Creswell, 2014). As a result of this stage, 2136 individual responses were reduced to 1988 and included in the analysis stage. Table 3 represents the demographics of respondents.

Table 3 illustrate the primary demographic data collected via the survey contained the participant's role, awareness regarding the

**Table 3**
Research Participants Details (*N* 1988)

| Demographics | Frequency | Percent |
|---|---|---|
| **Organizational sector** | | |
| Public | 1226 | 61.7% |
| Private | 762 | 38.3% |
| **Roles** | | |
| Managing director or board member | 69 | 3.47 % |
| Head of IT / Department | 167 | 8.40 % |
| Administration | 251 | 12.6 % |
| IT Staff | 704 | 35.40 % |
| Strategy development | 492 | 24.75 % |
| Finance | 186 | 9.35 % |
| Other | 119 | 6.0 % |
| **Knowledge related to organization strategy** | | |
| Little knowledge | 102 | 5.13 % |
| Some knowledge | 345 | 17.35 % |
| Good knowledge | 798 | 40.15 % |
| Excellent knowledge | 743 | 37.37 % |
| **Knowledge related to organization management** | | |
| Little knowledge | 98 | 4.93 % |
| Some knowledge | 441 | 22.18 % |
| Good knowledge | 845 | 42.50 % |
| Excellent knowledge | 604 | 30.38 % |
| **Experience related to IT** | | |
| Less than 1 year | 427 | 21.48 % |
| 1-2 | 223 | 11.22 % |
| 3-5 | 310 | 15.60 % |
| 6-10 | 191 | 9.61 % |
| 11-15 | 562 | 28.27 % |
| More than 15 years | 275 | 13.83 % |
| **Total** | **1988** | **100 %** |

strategy and management, and their experience with IT. Of the respondents, 35.40% were employed as IT professionals and 24.75% worked in a strategic position. About 77.52% of the contributors possessed good quality and excellent knowledge about the organization strategy, where 72.88% of the research participants had an outstanding knowledge of organization management. Most of the respondents had between 11-15 years' experience in the IT sector.

Figure 3 demonstrates the participants' employment sectors within the research survey. The results indicated that 21.5% (429) participants were from the service sector; 17.7% (353) from the healthcare sector, and 16.4% (326) from the manufacturing sector. The lowest contributor sector organizations were the retail sector, with 5.5% (108) participants, and the transportation sector, with only 4.3% (84) participants.

Figure 4 presents the research participant countries and their representation from each industry from the individual country. The study displays that the highest number of contributors were from the U.S. and China, followed by Australia and the U.K, with the least numbers represented by South Africa.

## Research Results

### *Measurement Results*

Various statistical methods were used to evaluate suitability, accuracy, and validity of the measures used. Confirmatory Factor Analysis (CFA) was utilized to evaluate the validity of the scales. Additional statistical tests associated with validity and reliability of the scales were performed to determine the internal consistency of the measurements.

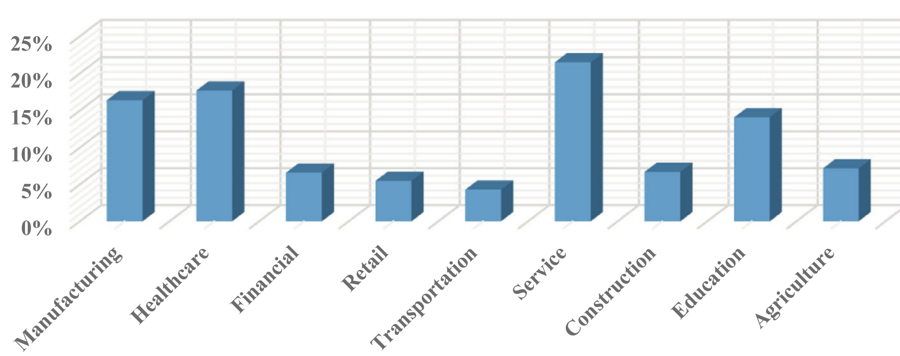


**Figure 3.** Research participant sectors

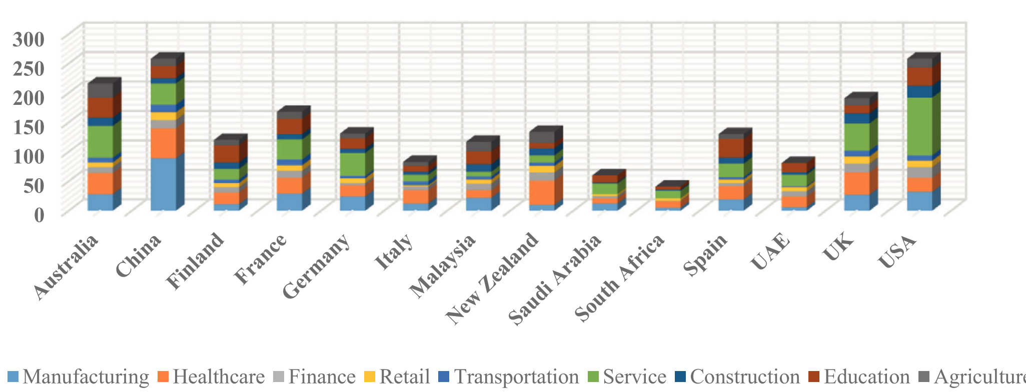


**Figure 4.** Research participant countries

**Table 4**
Residual Matrix Results

| | ES | MI | OZ | MS | DoC | TUA | CA | AW | OR | ITI | OSs | ITB | EK | ITE | TC | BR | II |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ES** | 0.00 | | | | | | | | | | | | | | | | |
| **MI** | 0.03 | 0.00 | | | | | | | | | | | | | | | |
| **OZ** | 0.01 | 0.09 | 0.00 | | | | | | | | | | | | | | |
| **MS** | 0.08 | -0.01 | 0.07 | 0.00 | | | | | | | | | | | | | |
| **DoC** | 0.07 | -0.03 | 0.01 | 0.07 | 0.00 | | | | | | | | | | | | |
| **TUA** | 0.01 | 0.06 | 0.04 | 0.03 | 0.08 | 0.00 | | | | | | | | | | | |
| **CA** | 0.11 | 0.15 | 0.07 | 0.09 | 0.06 | 0.11 | 0.00 | | | | | | | | | | |
| **AW** | 0.14 | 0.19 | 0.05 | 0.08 | -0.01 | 0.09 | 0.04 | 0.00 | | | | | | | | | |
| **OR** | 0.09 | 0.03 | 0.08 | 0.04 | 0.09 | -0.02 | 0.07 | 0.05 | 0.00 | | | | | | | | |
| **ITI** | 0.08 | 0.05 | 0.04 | 0.08 | 0.06 | 0.04 | 0.08 | 0.17 | 0.04 | 0.00 | | | | | | | |
| **OSs** | -0.04 | -0.07 | 0.09 | 0.08 | 0.08 | 0.07 | 0.15 | 0.12 | 0.09 | 0.03 | 0.00 | | | | | | |
| **ITB** | -0.18 | 0.12 | 0.06 | 0.09 | 0.15 | 0.08 | 0.13 | 0.05 | 0.16 | 0.01 | 0.05 | 0.00 | | | | | |
| **EK** | 0.05 | 0.07 | 0.09 | 0.07 | 0.06 | 0.04 | 0.02 | 0.02 | 0.04 | 0.04 | 0.08 | 0.03 | 0.00 | | | | |
| **ITE** | 0.02 | 0.12 | 0.04 | 0.02 | 0.10 | 0.05 | 0.12 | 0.01 | 0.08 | 0.01 | 0.06 | 0.03 | 0.09 | 0.00 | | | |
| **TC** | 0.01 | 0.06 | 0.08 | 0.03 | 0.06 | 0.06 | 0.09 | -0.01 | 0.03 | 0.01 | 0.04 | 0.02 | 0.04 | 0.03 | 0.00 | | |
| **BR** | 0.04 | -0.09 | 0.02 | 0.02 | -0.11 | -0.03 | 0.06 | -0.04 | 0.05 | 0.03 | 0.07 | 0.03 | 0.01 | 0.03 | 0.02 | 0.00 | |
| **II** | 0.07 | -0.02 | 0.06 | 0.01 | 0.08 | -0.05 | 0.10 | -0.03 | 0.02 | 0.01 | 0.02 | 0.01 | 0.06 | 0.01 | 0.04 | 0.01 | 0.00 |

ES: Executive Support; MI: Management Intention; OZ: Organization Size; MS: Managerial Structure; DoC: Degree of Centralization; TUA: Technology Use Attitude; CA: Change Attitude; AW: Awareness; OR: Organization's Resource; ITI: IT Infrastructure; OSs: Organizational Systems; ITB: IT Budget; EK: Employee IT Knowledge; ITE: IT Expertise; TC: Technical Competence; BR: Business Requirement; II: Information Intensity

*Factor analysis*

Confirmatory factor analysis was used to confirm the quality of the measurement framework (Awang et al., 2015). Accordingly, AMOS Graphics 22 was used to conduct the CFA. Measurement frameworks are of three kinds: tau-equivalent, parallel, and congeneric measurement (Hair et al., 2006). This research uses the congeneric measurement since it helps refine the measurements through fit measures. Through the technique, separate testing was carried out for the eighteen constructs as recommended by Byrne (2001) and Holmes-Smith et al. (2006). In the process, the total number of items were reduced from 88 to 79. Based on suggestions by Byrne (2001) and Hu and Bentler (1995), the overall measurement model was tested using the remaining items. About eight items were removed in this step of refinement in order to ensure no significant error correlations and cross loadings were present prior to evaluating the structural model, leaving behind 71 items and eighteen factors. Items were removed at this stage after considering the minimum number of items required for each construct and by ensuring that the removal of those items did not substantially reduce the validity of the constructs. The final measurement model indicated good model-data fit (Byrne, 2001; Hu and Bentler, 1995) with the following fit statistics: GFI=0.94, AGFI=0.85, RMSEA=0.060, RMR=0.033, Chi-sq/DF=1.628, IFI=0.93, CFI=0.91 and TLI=0.90.

*Reliability and validity*

The constructs' validity and reliability were assessed using a variety of methods. The recommended acceptable level for the measure of Cronbach's Alpha was ≥.70 (Stafford & Turan, 2011; Lawrence & Adams, 2018) and the construct values were between 0.774 and 0.911. Standardized Regression Weights (SRWs) were used for the assessment of Convergent Validity. Here, the factor loading was proposed to be 0.50 or higher (Hair et al., 2006). The values returned ranges from 0.572 and 0.898 indicating convergent validity. The recommended level for Squared Multiple Correlation (SMC) is 0.30 or more and it shows the dependency between items present within factor determination (Holmes-Smith, 2011). The returned values of SCM test were in the range of 0.508 and 0.916. Lastly, 1.96 is the recommended standard value for the Critical Ratios (CR) (Holmes-Smith, 2011), and the values that were returned were between 10.249 and 24.732.

*Structural Equation Modelling Results (SEM)*

The objective of the current research model was to evaluate the significant organizational factors that influenced IT innovation adoption. Seventeen measures representing six second order constructs were hypothesised to be affecting the IT innovation adoption. To evaluate the hypothesized relationship between these constructs, the structural model was evaluated as recommended by Arbuckle (2005) and Marcoulides and Moustaki's (2014). Moreover, Byrne (2016) recommend SEM as an approach for extracting variables that may affect the values of other latent variables directly or indirectly. A moderate level of fit was determined after assessment of the structural model based on the fit indices (GFI = 0.90, AGFI = 0.81, RMSEA = 0.061, RMR = 0.043, Chi-sq/DF = 2.963, IFI = 0.92, CFI = 0.89 and TLI = 0.90).

Furthermore, to confirm that the organizational level technology adoption model had a good fit, the residual matrix was evaluated (Table 4). The vertical distance between a data point and the regression line is referred to as the residual matrix (Schermelleh-Engel et al., 2003). Each single data point has one residual. The residual matrix, shown in Table 4 describes the variations in corresponding values in the predicted and observed matrices. The residual matrix findings indicated that the organizational proposed framework was appropriate, and that all components were sufficiently close to zero.

The regression analysis outcomes based on the structural model for each hypothesis is shown in Table 5. The path coefficient ($\beta$) value, critical ratio (t-value), R Square ($R^2$), and p-value were used to determine the SEM results in this research as illustrated. For a t-value greater than 1.96 and a p-value of 0.01 or 0.05, the standard decision rules were used. Results indicated that all hypotheses were supported except for the moderating role of support factors (H6a & H6b). The final structural model with standardized loadings is shown in Figure 5.

## Discussions

Drawing from a range of scholarly findings and the CMO framework, the current study presented a comprehensive model of organizational level and innovation readiness related factors required for successful IT innovation adoption. All three organizational factors considered had a significant impact on both dimensions of IT

**Table 5**
Results of the hypothesized path relationships

| Hypotheses | Paths | | | Research Structural Framework | | | | Results |
|---|---|---|---|---|---|---|---|---|
| | | | | Standardised (β) | S.E. | C.R. (t) | P value | |
| H-1a | Top Management Support | → | Technology Readiness | .674 | .233 | 3.523 | .011* | Supported |
| H-1b | Top Management Support | → | Internal Expertise | .263 | .089 | 2.629 | .014* | Supported |
| H-2a | Organization Structure | → | Technology Readiness | .295 | .172 | 2.595 | .005** | Supported |
| H-2b | Organization Structure | → | Internal Expertise | .319 | .069 | 2.473 | .004** | Supported |
| H-3a | Organization Culture | → | Technology Readiness | .288 | .164 | 1.998 | .025* | Supported |
| H-3b | Organization Culture | → | Internal Expertise | .521 | .260 | 2.692 | .016* | Supported |
| H-4 | Technology Readiness | → | IT Innovation Adoption | .673 | .155 | 4.732 | .002** | Supported |
| H-5 | Internal Expertise | → | IT Innovation Adoption | .546 | .217 | 3.102 | .006** | Supported |
| H-6a | External Factors | → | Technology Readiness- IT Innovation Adoption | .013 | .081 | .029 | .941 | Not Supported |
| H-6b | External Factors | → | Internal Expertise- IT Innovation Adoption | .047 | .210 | .224 | .854 | Not Supported |

* P < 0.05 level
** P < 0.01 level

innovation readiness as hypothesized (Figure 5). In view of the results, this section explains the scientific value and practical utility of the research for both scholars and practitioners. The readiness categories as identified add to existing knowledge about which factors inform scholarly understanding about future innovation adoption success. Several new theoretical contributions can be noted for each of the organizational and TR readiness factors presented within the theoretical framework (Figure 1), providing revelatory knowledge that build on, extend, and challenge extant research. Based on the CMO framework, top management support, organizational structure and organizational culture were the contextual factors of the organization that were hypothesized to impact IT innovation adoption (outcome) through IT innovation readiness (mechanism). The results provide support for the overall model in conformation with the CMO framework that the two factors related to IT innovation readiness: the technology readiness and internal expertise act as important intervening factors in facilitating IT adoption at the organizational level. However, there was no sufficient evidence to indicate that the external factors considered in this study moderated the relationship between readiness and IT innovation adoption. In the subsequent sections we discuss the role of each of the factors considered in this study in the light of our findings.

*Top Management Support*

For TMS, two contributions to existing theory should be noted. First, although TMS has been found to support the necessary resources for technology adoption (Oliveira et al., 2014; Boone et al., 2018), the link between TMS and organizations' readiness for IT innovation has not been sufficiently explored. Results of this study indicate that TMS and technology adoption (Figure 5) are mediated by the IT innovation adoption conceptualized through technology readiness and internal expertise dimensions. This is an important finding showing that TMS is more effective when organizational readiness is evident and abundant. Perhaps this accounts for why some studies have found a negative relationship between TMS and technology adoption

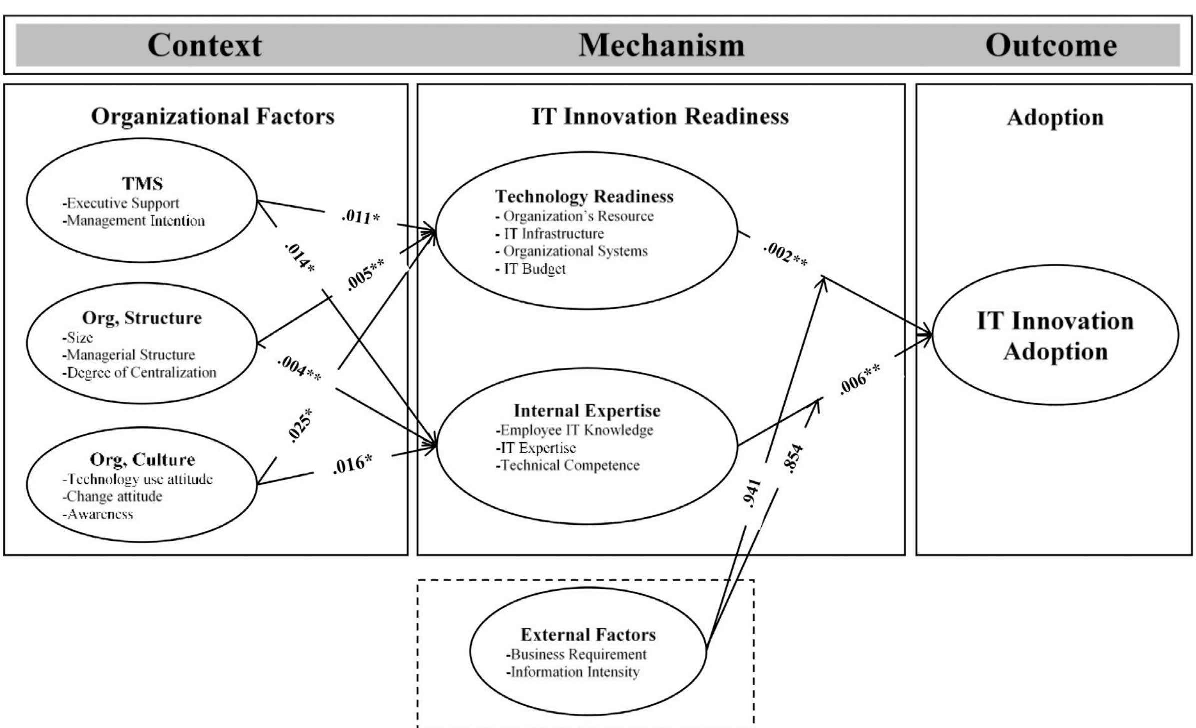


**Figure 5.** Structural model of organizational level IT innovation adoption with standardized loadings (* is p<=0.01 & ** is p<= 0.05)

(e.g., Ali et al., 2020; Gutierrez et al., 2015). Hence it is important that while there is executive support from the top management and they show their commitment for adoption of new technologies, efforts should be taken to prepare the organizations to be technologically ready for such adoption.

Second, this study also finds that in addition to technologically readiness, top management should ensure that commitments are made to develop the internal expertise of the people involved in IT innovation adoption. This finding deepens prior research that found that the motivation to adopt technology was driven by internal factors, such as views related to the inter-organizational legitimacy and perceived benefits of technology (Ren, 2019; Reyes et al., 2016; Qian et al., 2016). Extant research have been equivocal about what these internal factors looked like except within a broader lens. While some studies have shown that TMS only is insufficient for technology adoption (Vagnani & Volpe, 2017), our findings indicated that the challenges of adoption could be mitigated by TMS by cultivating the internal expertise through employee knowledge, IT expertise and technical competence. Without this investment, merely looking for inter-organizational legitimacy, and trying to inform the employees about the benefits and challenges of the technology, may not translate into tangible and successful technology innovation adoption.

*Organizational Structure*

This study provides revelatory advances to scientific knowledge in two ways. First, while there is a direct correlation between organization size and the adoption of new technology in some prior studies (Ali et al., 2015; Gutierrez et al., 2015), others have found mixed results between size and technology adoption (Prause, 2019; Karunagaran et al., 2019). Similarly, although extant research suggests that size was one of the main factors determining the adoption of new technology (Ali et al., 2020; Barham et al., 2020), it was not clear what other structural dimensions were influential. Organization structure is not just about size. This study provides a broader view of organizational structure that includes organizational size, managerial structure, and the level of centralisation and finds that structure is highly correlated with both the dimensions of IT innovation readiness (Figure 5). The current study thus deepens knowledge related to organization structure by testing how structural effects impact technology adoption outcomes. Second, while prior studies have shown that organizational structure plays a role in the adoption of IT, we find that it is not sufficient to highlight the importance only of the right organizational structure for IT innovation adoption. Rather, while structure directly determines the success of IT adoption, other intervening variables such as the organizations' readiness for innovation adoption are equally influential structural properties on IT innovation adoption. Results suggest that both dimensions related to IT innovation adoption - technological readiness and internal expertise - need to be aligned with the right structure for a successful adoption. When embedded within the overall context-mechanism-outcome perspective framework, these relationships, as hypothesized, are more valuable by directing managerial attention to why the overall organization design and structural features are influential and important.

*Organizational Culture*

The study found that culture positively influences technology readiness and internal expertise, which in turn are positively related to technology adoption outcomes. That is, technology user attitude, change attitude, and cultural awareness are important antecedents to the intention to adopt computer technology (Gupta et al., 2019). These findings are consistent with other similar studies that organizational culture is a critical factor in the adoption of IT (Chong et al., 2009; Melitski et al., 2010), but have not examined which cultural aspects influence IT innovation adoption. Our findings extend existing scientific knowledge related to how culture more specifically influences adoption outcomes. First, the results support the conceptualization of technology use attitude, change attitude, and cultural awareness, as subsets of organization culture. Results indicate that these cultural artefacts strongly correlate to technology readiness and internal expertise which mediate IT adoption. Second, the findings suggest that without these mediating factors, it is unlikely that IT adoption will be successful. This is a new finding in relation to specific types of cultural artefacts that are important in shaping overall IT innovation readiness and provides insights as to how organizational culture impacts IT adoption. This is in line with prior research that shows that proactive and welcoming individuals' helps organizations to build a supporting infrastructure and the systems necessary for the adoption of new technologies (Güner & Sneiders, 2014).

*Technology Readiness (TR)*

The results support the conceptualization of TR as an important component of overall IT innovation readiness that mediates the relationship between organizational factors and IT adoption. While many studies as noted earlier have found significant results when studying the effects of individual TR - such as readiness knowledge possessed by an IT director - the current study presents TR at an organization-level as part of the overall IT innovation readiness of the organization which plays a key role in IT innovation adoption. IT readiness in organizations include installed network technologies and enterprise systems within an overall technological framework. Organizations cannot presuppose that their current level of organization-level readiness is sufficient for successful IT adoption and should actively look at ways to improve their technological readiness prior to adoption of new technologies. If the specific dimensions of readiness such as IT infrastructure and budget are not evident, the broader organizational factors identified in this study may not be sufficient for a successful IT adoption. The results support hypothesis H4 and indicate that organizations that have greater TR are in a superior position to adopt technology. This finding is consistent with the results from earlier studies where greater IT readiness translated into organizations that were in a better position to adopt IT innovations (Gangwar et al., 2014; Iacovou et al., 1995). At the organizational level of IT adoption, building the right level of technological capability prior to the actual adoption will be significant within an organization's overall state of preparedness.

*Internal Expertise (IE)*

Regarding the internal expertise dimension as well, the findings of this study are consistent with prior research where specialized technology-related knowledge at an individual-level was expected to influence the success of individual-level adoption of those technologies (Lian et al., 2014; Murray, 2018). This is the first study to find broad empirical evidence suggesting that IE at an organizational level works in tandem with TR to facilitate organizational-level IT innovation adoption. The results confirm and extend prior research that found that specialised knowledge among the IT professionals assist in new technology adoption (Sun & Jeyaraj, 2013; Gangwar et al., 2014; Lynn et al., 2018). It should be noted that expertise here does not relate to a generic range of knowledge, skills, and abilities as conceptualized in many prior studies, rather, it is the specific employee IT knowledge, IT expertise, and technical competence that mediates the relationship between organizational factors and technology adoption. Among the organizational factors considered in the study, organization culture has the largest effect on IE. This indicates that the specific cultural artefacts that were measured in this study are associated strongly with the IE dimensions, highlighting the importance of organizational culture in facilitating the development of employee knowledge and skills for a successful IT adoption. For example, Muhammed and Zaim (2020) found that peer knowledge sharing is an important aspect of organizational knowledge development. A conducive organizational culture can promote such knowledge sharing which can help in the development of internal expertise essential for successful organizational level IT innovation adoption.

*External Factors*

In contrast to existing research related to business requirements and information intensity, the moderating role of these factors in the relationship between IT innovation readiness and adoption was not supported. These findings are inconsistent with previous research where business needs were expected to help organizations to be more successful in adopting technology (Alemeye & Getahun, 2015; Fu et al., 2016). While from a theoretical perspective these factors were expected to influence IT adoption, empirical evidence for this has been limited. For example, in a study by Mahdaly and Adeinat (2022), they did not find a significant relationship between information intensity adoption of RFID. Further, in relation to the business environment, only trading partner pressure was significant in RFID adoption and regulatory and competitor pressures did not have a significant influence. It is possible that a more nuanced approach to discerning specific environmental factors may be needed to identify relevant external factors when examining IT innovation adoption. Another possible explanation is that other external factors which were not analysed due to the limited scope of this research, may have been desirable. In this study, only business requirements and information intensity were selected, perhaps limiting the influence of other potential external factors. The results indicate that business requirements and information intensity together are not sufficient as a moderator to influence the relationship between IT innovation readiness and successful technology adoption outcomes. Future studies may also examine business requirements and information intensity in the context of specific industries to evaluate whether these relationships hold in such contexts.

*Implications for Practice*

This study points to several important managerial implications for organizations interested in accelerating the adoption of ITs in their organizations. As highlighted in the innovation adoption and IT adoption literature (see Dong et al., 2009; El-Haddadeh et al., 2020; Jeyaraj et al., 2006; Senyo et al., 2018), this study confirms the central role of top management in the adoption of technology. Since such adoption decisions have significant financial implications and will influence an organization's overall strategic orientation, both management's intentions towards the adoption of such technologies, and the actual support they provide have a direct bearing on organizations' IT innovation readiness. While many such initiatives originate at the mid-level or even lower-level management (Alam & Noor, 2009; Carr Jr, 1999), educating top management regarding the benefits and obtaining their buy-in remains an important aspect of successful organizational level technology adoption outcomes.

As hypothesized in this study we found that organizational structure has a significant impact on IT innovation readiness and in the adoption of ITs. While larger organizations are advantaged arguably because of larger IT budgets, implications for practice for smaller firms mean that in assessing their overall level of resources, more resources will be required to support IT innovation adoption. Managers in smaller organizations that have a highly decentralized structure may need to evaluate adoption decisions with additional care and weigh the cost-benefits of such decisions. A key point for managers however from this study is how to connect the organizational factors with the readiness dimensions of IT innovation adoption. The high correlations suggest that these associations are both timely and important and should not be neglected. In relation to culture, one of the key steps for managerial practice lies in building a positive culture by building awareness of adoption benefits for the organization and in individual work units (Dinev & Hu, 2007; Leidner & Kayworth, 2006). Here, the importance of specific IT cultural artefacts should be promoted along with the more general effects of culture. A positive culture contributes to building an internal expertise necessary for IT innovation adoption, and in building the organization's technological readiness as evident in the results of this study.

## Limitations and Future Directions

Considering that there are many organizational factors that influence the adoption of technology, future research should extend the research framework and include additional variables related to the support factors that influence IT adoption outcomes. Support factors could be extended to include macro factors such as competition, government policies, and market forces (Bakar et al., 2020; Dasgupta et al., 1999; Oliveira et al., 2014), and micro factors such as change readiness. Similarly, another important aspect of IT adoption is the assessment of internal and external risks associated with adoption of new technologies. While the IT innovation readiness dimension conceptualized in this study captures some elements of this risk such as not allocating sufficient budget, and lack of proper competency with the new technologies being adopted, future studies could focus on such internal and external risk factors explicitly in the context of IT innovation adoption. Further, the external factors may become relevant in specific industries and in specific organizational contexts. While the broad coverage of the dataset used to test the theoretical framework supports generalizability of the findings, it can mask important nuances that are specific to certain industries. For example, Oliveira et al. (2014), found that TMS and compatibility of technology was significant in a service context, however, these were not significant in a manufacturing context in the adoption of cloud technologies. Similarly, certain factors may be more relevant in specific technology adoption contexts, such as in cloud technology adoption, mobile technology adoption, or adoption of technologies related to artificial intelligence/machine learning (Hassan et al., 2017; Mendling et al., 2018; Sun et al., 2018). Future studies might consider the technology adoption context such as innovation characteristics (Oliveira et al., 2014), and other environmental factors (Chiu & Yang, 2019; Peltier et al., 2012) that may play an important role. Due to the limited scope of this research investigating the internal organizational factors and the mechanism of how they affect organizations' IT innovation adoption, the external technological characteristics such as the attributes of technological partners, vendors and suppliers have not been considered in the current research. Future, studies may examine these and other external factors that may influence the success of the organizational level adoption of innovative information technologies.

## Conclusions

The aim of this study was to provide new insight and a novel approach to the IT literature by complementing and extending previous research related to organizational level technology adoption. A research model focused on organizational factors was presented to test specific hypotheses based on a context-mechanism-outcome perspective. While some studies examined the external elements related to IT innovation adoption, few studies had explored in detail the organizational factors and the mechanism in relation to adopting new technologies. The study explored the emerging gaps in the literature, namely the limited focus on the organizational factors rather than the individual and technological aspect of IT innovation adoption. The hypotheses were developed based on solid theoretical foundations and were empirically validated using a large data set collected globally from a wide range of industries. The results support most of the hypotheses except for the moderating relationships hypothesized based on select supporting factors relevant to IT adoption. Given the study aims, the development of the organizational level technology adoption framework provides new insight and adds to the novel approach adopted. We hope that the framework presented and the results from empirical analysis pave the way for future studies to explore organizational level IT innovation adoption in greater detail as contemporary organizations navigate adoption of innovative information technologies like cloud computing, internet-of-things, blockchain, artificial intelligence, and machine learning.

## Declaration of Competing Interest

There is no conflicts of interest for this manuscript.

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