

How information technology influences organizational communication: the mediating role of organizational structure

IT influence on
organizational
communication

633

XinYing Chew

School of Computer Sciences, Universiti Sains Malaysia, Pulau Pinang, Malaysia

Raed Alharbi

Taif University, Taif, Saudi Arabia

Khai Wah Khaw

School of Management, Universiti Sains Malaysia, Pulau Pinang, Malaysia, and

Alhamzah Alnoor

*School of Management, Universiti Sains Malaysia, Pulau Pinang, Malaysia and
Management Technical College, Southern Technical University, Basrah, Iraq*

Received 5 August 2021
Revised 5 May 2022
Accepted 22 March 2023

Abstract

Purpose – The study is interested in knowing “the role of the organizational structure as a mediating variable of the relationship between the information technology and organizational communication”.

Design/methodology/approach – The study was conducted in several service companies, and the study adopted the questionnaire as a basic tool for the data collection on the practical side, as 267 opinions were surveyed, in addition to conducting personal interviews, and the normal distribution of data was tested, analyzing, describing and diagnosing study variables, testing correlations and determining direct effects.

Findings – Findings show that there is no direct and significant statistical impact of information technology on organizational communications. Whereas there was a positive, direct and statistically significant impact of information technology on the organizational structure. There was also a positive, direct and statistically significant effect of the organizational structure on organizational communication.

Research limitations/implications – This paper is restricted to the role of the organizational structure as a mediating variable of the relationship between the influence of information technology on organizational communication.

Practical implications – As part of the practical implication, the paper suggests the need to increase support and attention to the importance of information technology in service organizations in order to increase coordination and organizational communication and achieve a high ability to explore and exploit ideas.

Originality/value – Apart from the fact that several companies were engaged, the organizational structures of these companies were engaged too to examine the impacts of Information technology (ICT) on organizational communication.

Keywords Information technology, Mediating role, Organizational communication, Organizational structure

Paper type Research paper

© XinYing Chew, Raed Alharbi, Khai Wah Khaw and Alhamzah Alnoor. Published in *PSU Research Review*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

Funding: This work is funded by the Ministry of Higher Education Malaysia, Fundamental Research Grant Scheme [Grant Number: FRGS/1/2022/STG06/USM/02/4], for the Project entitled “Efficient Joint Process Monitoring using a New Robust Variable Sample Size and Sampling Interval Run Sum Scheme”.



1. Introduction

Information technology and rapid scientific and technical progress have imposed incredible pressures on modern societies, the information generated so much that we are faced with an information explosion, information pollution and information augmentation. Most organizations in all sectors of industry, commerce and government services depend mainly on their information technologies. In Rockert's words (1979), information technology (IT) has become inseparably intertwined with companies (Alnoor *et al.*, 2021; Wah *et al.*, 2022). In some industries such as communications, media, entertainment and financial services, the existence of an organization depends critically on the effectiveness of the application of information technology (Al-Daneshuar and Ramesh, 2010). As well as technology represents one of the most important topics in management and is considered one of the tools of strategic management in the completion of its work and awareness of the internal and external environment. Additionally, without accurate and sufficient information, it will be great confusion due to the lack of information (Alnoor *et al.*, 2022a). Therefore, the application of IT in organizations has led to changes in various dimensions of the organization, including the structure of the organization, so it needs an appropriate organizational structure in order to work on using IT efficiently (Peyman *et al.*, 2011; Al-Abrow *et al.*, 2019b).

In addition, the organizational structure has an important role in how information flows within the organization and, as a consequence, the extent to which the processes are carried out and the resources on which the information requested by managers depends. The diversity of tasks at work is a critical issue affecting organizational objectives and the adopted hierarchy (Nia and Roohipour, 2013; Alnoor *et al.*, 2022b). The main issue is how an organization can respond to the need for processed information, and how it allows managers to design organizations with greater flexibility and data processing. There is a relationship between information and decision-making process (Huber, 2009; Al-Abrow *et al.*, 2021). In terms of the decision-making process, the existence of a limited number of alternatives leads to the identification of satisfactory rather than ideal alternatives. Therefore, makes options that are considered good enough instead of research, until he finds the best solution to his problems, in addition to this, the focus on communication structures is of importance for the development of IT theory because communication represents the basic type of operation of organizations and their work in the field of information technology (Holten and Rosenkranz, 2008; Alnoor *et al.*, 2021).

Since the beginning of the eighties, government institutions in many countries of the world have witnessed major changes in response to environmental changes and information technology as well as to reduce third-party spending by these organizations in a way that contributes to enhancing the quality of services provided by these institutions. Adopting organizational structures and more advanced information technologies are critical factors for increasing performance and achieving organizational excellence. Thus, was focused on business organizations and few studies were focused on service organizations, which require greater attention on government institutions. Most of the previous studies, whether in business or governmental organizations, tried to focus on the impact of information technology on one dimension, such as the organizational structure (e.g. Peyman *et al.*, 2011; Nia and Roohipour, 2013), communications (Holten and Rosenkranz, 2008; Farhangi *et al.*, 2012) and decision-making (Andersen, 2001; Mehdi, 2013; Khaw *et al.*, 2022a). Therefore, building an integrated model for the dimensions of information technology, organizational structure, communication and decision-making may give a clearer picture of the work of organizations. Improving the performance of government service organizations in Iraq requires the adoption of IT, which is mainly based on providing the technology infrastructures and the necessary knowledge that workers have to deal with to achieve efficiency and effectiveness for the use of resources and achieving goals (Khaw *et al.*, 2022b). Hence, this study sheds light on IT to the extent of its impact on organizational structures and thus on the success of the work of these institutions. According to the literature, the objective

of this study thus is to explain how information technology helps organizational communication in overcoming barriers of organizational information and how information technology needs to be aligned with the organizations' people and processes (Lin, 2011). In this context there are many barriers that prevent the utilization of organizational information. Thus, such a problem exacerbates organizational stagnation and increases technical problems. Furthermore, their findings cannot be generalized due to their challenges in conceptual framework, country, sample size and study design. Furthermore, other studies (Haamann and Basten, 2018) have investigated the effects of regulatory information on organizational communication with a small sample size. In addition, information technology in service firms with organizational structure and organizational communication has not been studied together in service companies (Herdiyanti *et al.*, 2017). At the same time, the results of Farhanghi *et al.* (2013) indicate that there is no impact of information technology on the organizational structure. Information technology supports organizational communication in various fields such as education, medicine, industry and services. What we do not know (yet) is how to transform and manage the torrent of information and technology so that future generations of those service providers, as well as future service companies, will benefit the most. The rate of technological progress is frighteningly fast. The combination of laptops and mobile phones already allows to connect to the Internet from almost anywhere, facilitating the process of communication and transfer of information quickly and easily for companies in different fields. Ward *et al.* (2001) have argued with some evidence that such immediate access to information technology can result in a loss of distinction between what is personally known or understood (personal knowledge) and what can be retrieved. Accordingly, this study overcomes the gap in previous studies by studying the impact of information technology and organizational information on organizational communication through the mediating role of the organizational structure in service companies, and hence the contribution of this study is to direct the organizational structure compared to what preceded it. In summary, this study aims to explain the impact of information technology and organizational information on organizational communication through organizational structure.

2. Literature review

2.1 Organizational information

The topic of information technology, specifically in organizations, is one of the topics that have received the attention of researchers, and research and studies are still continuing to this day, with the aim of knowing what it contains in terms of impact on organizations, including these studies (Wijnhoven and Wassenar, 1990; Fich, 2002; Seol *et al.* Taleghani and Mousauian, 2011; Eneizan *et al.*, 2019a; Hossain *et al.*, 2020a, b, c). While a number of other researchers focused on the impact of information technology on the organizational structure, including a study (Fidock, 2006; Peyman *et al.*, 2011), through its ability to make changes to the organizational structure of the organization and making these structures more flexible and responsive to the successive environmental changes (Khaw *et al.*, 2021). There are also a number of researchers who have dealt with the impact of information technology on the decision-making process in terms of its accuracy, timing and speed (Andersen, 2001; Nowduri, 2010; Mehdi, 2013; Eneizan *et al.*, 2019b). Another section of researchers has taken on another dimension that is no less important than the other dimensions of the organization, which is organizational communication (Holten and Rosenkranz, 2008; Hossain *et al.*, 2021; Abdulaali *et al.*, 2019).

The relationship between technology and the forms and function of the organization has been of interest to the scholars of the organization for more than (50) past years, and within the context of contingency theory, June Woodward's (1958–1965) research. Technology was formed as one of the three pillars of the attitude theory, as it determines the organizational

structure along with the size and environment of the organization. Later models of technology, organized by Thomson 1967, Perrow (1967, 1970) and Galbraith (1973–1977), show the processing of information from the structure, as well as the growing awareness of the role of technology in shaping the structure and function of the organization. While the decision-making process is represented as a reaction to the problem because there is a contradiction between the current state of a question and the desired state. Drucker and Maciariello (1999) also assert that unnecessary decisions not only represent a waste of time and resources but also render all decisions ineffective. Analyzing Drucker and Maciariello's opinion, we see that unnecessary decisions cause a drop in efficiency. This is due to its association with organizational resources, and this is what led to making decisions ineffective due to their failure to achieve the desired goals.

2.2 The communication technology and organizational structure

Communication in administration has become a constant concern of workers in business organizations, the military, public administration, hospitals, universities and research. Many psychologists, human relations experts and managers have worked hard to improve communication in large institutions (Drucker and Maciariello, 1999; Hadi *et al.*, 2018). Communication is, in fact, a complex two-way process (sent and received), as it can include many attempts to achieve a common understanding. Communication is achieved through several means, as we can communicate using words, symbols, images, voice, tone, facial expressions, clothes and body language (Alhamdi *et al.*, 2019). Also, one of the difficult challenges facing the administration is attracting individuals to realize the awareness and voluntary follow-up of organizational goals, as effective communication is vital to address this challenge. Organizational communication also gets a lot of attention in practice in every job or managerial activity that has adopted communication in one way or another. Planning and control require a great deal of communication, as is the organization's design, development, decision-making, problem-finding solutions, leadership and staffing. As well as the organizational culture that cannot be crystallized without communication.

Since the organization is a managerial function, it requires devising an organizational structure and allocating human resources to the function designed to ensure the achievement of goals. The organizational structure is an organizational chart that defines roles, tasks, and the relationship of individuals with subordinates. The organizational structure includes communication relationships, as well as its link to job design, information flow, work standards and rules, team dynamics and power relations.

As mentioned previously, the achievement of the goals represents the main purpose of the existence of organizations, as these objectives are divided into tasks, which in turn constitute the jobs, and then these jobs are grouped into divisions, and the sections in the organization can be described as marketing, sales, manufacturing, etc. These departments are linked together to finally form the organizational structure, which in turn gives the organization the appropriate form to achieve its function in the environment (Lunenburg, 2012; Hamid *et al.*, 2021). The views on the form of the organizational structure have witnessed changes over time, due to the successive environmental changes. Previously, the process of making decisions and assumptions was concentrated in the executive director at the top of the organizational level, while the material work is performed by individuals who are organized into separate functional departments. This model was effective and deeply entrenched in business organizations as well as governmental organizations and military organizations during the twentieth century. However, this type of structure is not always effective, especially in rapidly changing environments. Over the years, organizations developed other structural designs, most of which were aimed at increasing coordination and horizontal communication and encouraging the adoption of environmental changes (Soltani *et al.*, 2013).

2.3 *The relationship between information technology and decision-making*

Research and studies have shown a positive relationship between information technology and decision-making (GanjiNia *et al.*, 2013; Poon *et al.*, 2013). Where the positive results were on various dimensions and levels of decisions. The positive impact of information technology is reflected in the quality of the decision (Reddy *et al.*, 2009), as well as in the decision-making process (Abbas *et al.*, 2021). Because information technology provides accurate and timely information, which enhances coordination between the organization's departments (Reddy *et al.*, 2009). IT can also affect the mental thinking stage, as well as its influence on the stages of the decision-making process such as design, selection and implementation. This is due to the ability of information technology to reduce bias by providing objective and logical information. It also has a role in providing managers with the necessary information at various necessary administrative levels. Based on the foregoing, the current study assumes that information technology as an integral variable and its subdimensions, if used in the right way, will positively reflect on the decisions taken in Iraqi service organizations.

H1. There is a positive, statistically significant relationship between IT and managers' decision-making.

2.4 *The relationship between information technology and organizational communication*

IT has a fundamental and renewed role in increasing the effectiveness of organizational communication by reducing the time it takes to access information for decision-making. And that is through its great influence on internal communications, so that it increases its efficiency and effectiveness and transcends the limits of time and space (Al-Abrow *et al.*, 2019a). Likewise, the use of IT correlates positively with patterns of horizontal communication to increase empowerment effectiveness, enabling managers to make decisions at the lower level. Where IT helps pass quick access to large amounts of information faster and easier than before, especially in light of the development of e-mail as one of the communication channels emerging from information technology. There is a strong relationship between information technology and means of organizational communication such as hardware, software and applications (Hossain, 2019). Connect IT hardware, software, applications and networks to systems such as the Internet and the intranet to create a computerized environment for easy access to information, thus creating effective and rapid communication and information exchange. Hence, the study assumes that IT influences organizational communication in its subdimensions: official books, e-mail, intranet and meetings (Robson and Tourish, 2005; Kingston, 2007; Harp, 2011; Parsons and Urbanski, 2012; Carvallo, 2013).

H2. There is a positive, statistically significant relationship between information technology and organizational communication for managers.

2.5 *The relationship between information technology and organizational communication through the organizational structure*

The limits and dimensions of the influence of information technology on the organizational structure were determined by the previous relationship, which included the effect of IT on the dimensions of the organizational structure (formal, central and complex) (Alsalem *et al.*, 2021). As for the relationship that links the organizational structure to organizational communication, some studies have shown it as a positive relationship (Zandstra, 2011; Jabbar *et al.*, 2020). There is a link between organizational communication and organizational structure, and this link affects the distribution of tasks and responsibilities (Lunenburg, 2012; Albahri *et al.*, 2021; Krishnan *et al.*, 2021). When this function is clear and precisely defined, as well as the objectives, it will be reflected positively to make good communication performance

processes which are essential for effective decision-making. Also, one of the results of this relationship may lead to a reduction in the number of hierarchical levels, which in turn leads to improved communication as a result of reducing the distortions that reports and messages are exposed to as they move between hierarchical levels, as well as speed. The organizational structure, through its organizational characteristics (organic or flexible), can also affect the flow of information. Consequently, it influences the emerging communications in the organization (Albahri *et al.*, 2022) (See Figure 1).

H3. There is a positive relationship with statistical significance between organizational information and communication technology through the organizational structure.

3. Methodology

The researcher surveyed the opinions of several general directors, department heads and people's officials, because of their role in planning, organizing and directing the activities and programs of governmental organizations. Therefore, the researcher distributed (267) questionnaire forms, and a number of statistical methods were used and employed for the purpose of describing and analyzing the information on the study variables and testing its hypotheses, by using the computer to extract the results, and by relying on the ready-made application software package (SPSS, V. 17) and the program (Amos, V.20), the computer output provided a reference for most tables in the application side. About metrics, [Ensour and Alizizi's \(2014\)](#) scale was used to measure information technology and included 12 items, while the dependent variable measured organizational communication through 12 items using [Carvalho's \(2013\)](#) scale.

4. Result and analysis

In order to ascertain the validity and reliability of the measures of the three variables, several criteria were used. Where the values of the factor loading (which should exceed 0.50 and in the best case exceed 0.70) and the extracted average variance extracted (AVE) contrast rate values (whose values must exceed 0.50) were relied on for the purpose of validity. The Cronbach's alpha values and the composite reliability (CR) value (which are statistically acceptable when their value exceeded 0.70) were relied on for the purpose of ensuring reliability. [Table 1](#) shows the results obtained.

Through the results shown in the table, it becomes clear that the results were acceptable and indicate the reliability and validity of the three measures well. Whereas all the factor loading values exceeded 0.50, and the values of the average variance extracted exceeded 0.50, while Cronbach's alpha reliability and composite reliability were more than 0.70.

We used the mean and standard deviation for the purpose of describing the responses of the study sample toward the main study variables. The results in [Table 2](#) indicate that the

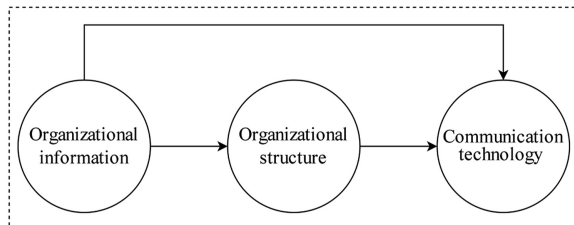


Figure 1.
Conceptual framework

Source(s): Author own work

Variables	Items	Factor loading	AVE	CR	Cronbach's α
Information technology	It1	0.847 ^{**}	0.523	0.873	0.901
	It2	0.703 ^{**}			
	It3	0.797 ^{**}			
	It4	0.763 ^{**}			
	It5	0.656 ^{**}			
	It6	0.543 ^{**}			
	It7	0.605 ^{**}			
	It8	0.716 ^{**}			
	It9	0.686 ^{**}			
	It10	0.732 ^{**}			
	It11	0.823 ^{**}			
	It12	0.750 ^{**}			
Organizational communication	Oc1	0.769 ^{**}	0.529	0.877	0.925
	Oc2	0.701 ^{**}			
	Oc3	0.734 ^{**}			
	Oc4	0.773 ^{**}			
	Oc5	0.823 ^{**}			
	Oc6	0.653 ^{**}			
	Oc7	0.791 ^{**}			
	Oc8	0.788 ^{**}			
	Oc9	0.637 ^{**}			
	Oc10	0.844 ^{**}			
	Oc11	0.597 ^{**}			
	Oc12	0.555 ^{**}			
Organizational structure	Os1	0.550 ^{**}	0.517	0.869	0.891
	Os2	0.664 ^{**}			
	Os3	0.701 ^{**}			
	Os4	0.711 ^{**}			
	Os5	0.718 ^{**}			
	Os6	0.790 ^{**}			
	Os7	0.875 ^{**}			
	Os8	0.779 ^{**}			
	Os9	0.700 ^{**}			
	Os10	0.628 ^{**}			
	Os11	0.765 ^{**}			
	Os12	0.694 ^{**}			

Note(s): * = $p \leq 0.05$, ** = $p \leq 0.01$

Source(s): Authors' own work

Table 1.
Validity and reliability

Variables	Mean	S.D.	1	2	3
1 – Information technology	3.12	0.858	1		
2 – Organizational structure	3.07	0.925	0.516 ^{**}	1	
3 – Organizational communication	3.02	0.852	0.557 ^{**}	0.685 ^{**}	1

Source(s): Authors' own work

Table 2.
Descriptive statistics and the correlation between variables

means were within limits and an average level, and that the values of the standard deviation were low, indicating a small dispersion of the data. As for the correlation coefficient between the three variables, most of them had a high positive correlation with a significant level of significance of 0.01. This provides primary support for the study hypotheses.

Based on what is shown in [Table 3](#), it becomes clear that there is no direct and significant and statistical impact of information technology on organizational communications. Whereas there was a positive, direct and statistically significant impact of information technology on the organizational structure. There was also a positive, direct and statistically significant effect of the organizational structure on organizational communication. As for the indirect effect, there was a positive fully mediating role of the organizational structure in the relationship of the influence of information technology on organizational communication. That is, the information technology indirectly affects the organizational communication through the organizational structure (to reject the first hypothesis that indicates the effect of the independent variable on the dependent variable). It is also evident that the indirect effect (the fourth hypothesis) has a greater influence coefficient than the direct effect, which enhances the importance of the mediator variable (information technology) in the current study model.

5. Discussions

The results indicated the great role that information technology plays in the sample companies, with a good percentage. As the answers of the sample members about all the paragraphs related to this axis and its subdimensions were in good agreement. The results confirm that information technology affects the organizational structure, which increases the effectiveness and efficiency of the organization ([Abdullah et al., 2021](#)). The results of the study strengthened the results of previous studies regarding the relationship between information technology in its dimensions and organizational communication by enhancing the role of organizational communications through the intranet and e-mail (Internet). In addition, the results showed that information technology influences decision-making through formalism and complexity by amount. Finally, the results showed a relationship between the dimensions of organizational communication (official books, e-mail and meetings) and decision-making, while the intranet did not show any influence on decision-making, and these indicators, in fact, may completely match the results of the interviews conducted with general managers. They stated that all their decisions are categorically based on the official books received ([Fadhil et al., 2021](#)).

In conclusion, senior management in companies should direct the importance of adopting information technology to increase flexibility to adapt to current and future business requirements. The need for relevant authorities to focus attention on databases in terms of volume and quality of data, and the use of organizational communications as a primary channel for data transfer to be invested in making quick and accurate decisions. Consequently, the needs to increase support and attention to the importance of

Hypotheses	β	S.E.	C.R.	P	Results
<i>Direct effect</i>					
H1 Information technology → Organizational communication	0.201	0.103	1.875	0.068	Unsupported
H2 Information technology → Organizational structure	0.416	0.041	8.529	***	Supported
H3 Organizational structure → Organizational communication	0.629	0.068	7.051	***	Supported
<i>Indirect effect</i>					
H4 Information technology → Organizational communication	0.262	0.086	3.452	***	Supported

Table 3.
Hypotheses testing

Source(s): Authors' own work

information technology in service organizations to invest the opportunities it provides in the speedy completion of work. Thus, reducing the need for some mechanisms such as committees, computerized information systems and official annual instructions.

6. Theoretical implications

Our study has many implications for researchers in the field of information technology, organizational communication and organizational structure. First, our study presents the compatibility between information technology and organizational communication from a holistic perspective and provides empirical evidence for the impact of the role of information technology to fit the organizational structure and corporate strategy. Our findings expand the current understanding of the interrelationships between the role of information technology and organizational structure. Specifically, previous studies have presented the interrelationships between certain dimensions of organizational structure and certain types of information technology sources (Hossain *et al.*, 2020a, b, c). Importantly, our findings suggest the need to implement an organizational information strategy to develop a comprehensive assessment of organizational communication characteristics.

Second, our study finds that the role of information technology will be negatively affected by deviation from the “ideal” organizational communication profile to implement a given innovation strategy. This finding suggests that it is not the choice of innovation strategy *per se* that drives differences in the information technology cycle between firms, but rather the extent to which a particular strategy type is implemented based on organizational communication. Previous literature highlighted the importance of implementing information technology as a source of competitive advantage (Hossain *et al.*, 2020a, b, c). However, our findings suggest that suitability of information technology and organizational structure will be a major source of competitive advantage for service firms. This finding enhances our understanding of the specific configurations of organizational communication under different strategic innovation clusters, which are important for achieving superior innovation velocity and innovation quality in service and product delivery. Finally, by using the contingency theory, our study crystallizes the theoretical argument about how different components fit the role of organizational structure and information technology as well as how this fit affects organizational information performance, thus broadening the organizational structure. Specifically, our study integrates visions between innovation management and organizational communication and experimentally validates the importance of compatibility between the role of organizational information and communication technology by adopting a contingency theory (Hossain *et al.*, 2019). In this view, contingency theory may provide a good perspective to understand the nature of cross-domain synergies between information technology and organizational structure, and thus, we urge more researchers to investigate interdisciplinary research between innovation, communication and management from the lens of contingency theory.

7. Practical implications

In practice, this study found that although information technology, organizational communication and organizational structure bring many benefits to businesses through various applications, their implementation is a challenge that limits these benefits. The government must not only improve access to information technology and organizational communication but also develop policies with incentives designed to develop the skills and capabilities of managers and employees of companies that provide services. Adequate skills and knowledge of organizational information technology and organizational communication will enable companies to use the technological innovation and digital tools they need to access

global markets for their products, goods or services (Chattopadhyay and Bhawsar, 2017; Hossain *et al.*, 2019). Government policy should aim to improve the organizational structure by strengthening the organizational structure; enhancing the technological externalities of firms within the services industry; creating ongoing information technology and organizational communication resource centers; and disseminating information technology and organizational communication innovations to enhance corporate performance. Although information technology, organizational communication and organizational structure are a challenge in developing countries, previous studies recommend strengthening information technology and organizational communication through organizational initiatives such as training, developed work plans and benchmarking practices designed to familiarize employees with the latest technologies (Franco and Garcia, 2017; Hossain, 2019). Thus, government policies relating to enterprises in developing countries should address the performance of firms providing services on the basis of viable incentives for innovation activities. Relevant government agencies should make a concerted effort to strengthen companies by providing the necessary training for entrepreneurship. Industrial practitioners should review their information technology, organizational communication and organizational structures approach and structure in line with global trends to enable companies to keep pace with changes in technology. Governments must facilitate effective technology transfer to narrow the digital divide between industrialized and developing countries. This will foster global collaboration that enables interconnection and catalyzes information technology, organizational communication and organizational structures in business programs.

8. Limitation and future research

The case study was conducted in service organizations. Furthermore, there is concern about the generalizability of the results. Therefore, studying the topic in other sectors may increase the generation of interesting results, especially in the energy sector. In addition, the impact of information technology on organizational communication and organizational structure was investigated. However, addressing more variables through ongoing and future research enhances the practical and theoretical implications. In this context, we suggest examining the impact of crisis management factors such as risk-taking, crisis management and knowledge of the crisis on performance. It will be interesting to investigate the strength of the relationship between crisis management factors and performance through the interactive role of innovation. Additionally, future studies should be concerned with the issue of decision-making and the impact of such an issue on the financial performance of companies. By expanding the study variables to include many aspects, such a procedure can support to generalize the results.

9. Conclusion

The rapid developments in information technology that occurred in the past two decades have completely changed the business environment. Similarly, information technology has greatly impacted service companies in several ways, thus transforming the traditional service delivery process into more technology-driven service delivery. Information technology has also affected customer acceptance of services and the planning stage to receiving the product or service. Thus, this affected the skills and knowledge required in the process of organizational communication within companies. However, there are risks that accompany technology adoption such as virus attacks, hacking, disavowal, fraud, tampering and unauthorized access to data within companies which negatively affect the organizational communication process. Hence, software security must be implemented within companies to

ensure that only authorized users can access IT resources. Service providers must be aware of these risks and, therefore, new audit techniques are needed to overcome these risks. The widespread use of information technology by both service companies as well as clients emphasizes the importance of focusing on IT training and organizational structure during the specified period of managers' jobs to help employees become more skilled with the necessary IT expertise in the current service delivery environment. It is necessary to enhance the technical and analytical skills of workers and to develop specialized teams capable of evaluating the effectiveness of computer systems during production operations. Basic and clear data is needed in the organizational structure so that service workers can assess the adequacy of standards and compliance with them. It is recommended that some standards of service provision should be enacted to provide guidelines that help define the role and responsibility of employees in this electronic environment. This paper improves the growing literature on the impact of technology on service companies by providing new insights in different contexts. The paper examines the perception of the beneficiaries of these services about the extent of use and the perceived importance of the use of technology in information in all different economic and cultural situations. The paper reviews the perception of services companies working in large international service providers in addition to local companies in Iraq. The collected data is analyzed using tests such as partial least squares structural equation modeling (PLS-SEM).

References

- Abbas, S., Al-Abrow, H., Abdullah, H.O., Alnoor, A., Khattak, Z.Z. and Khaw, K.W. (2021), "Encountering Covid-19 and perceived stress and the role of a health climate among medical workers", *Current Psychology*, pp. 1-14, Article in press.
- Abdulaali, A.R., Alnoor, A. and Eneizan, B. (2019), "A multi-level study of influence financial knowledge management small and medium enterprises", *Polish Journal of Management Studies*, Vol. 19 No. 1, pp. 21-31.
- Abdullah, H., Ismail, I., Alnoor, A. and Yaqoub, E. (2021), "Effect of perceived support on employee's voice behaviour through the work engagement: a moderator role of locus of control", *International Journal of Process Management and Benchmarking*, Vol. 11 No. 1, pp. 60-79.
- Al-Abrow, H., Alnoor, A. and Abbas, S. (2019a), "The effect of organizational resilience and CEO's narcissism on project success: organizational risk as mediating variable", *Organization Management Journal*, Vol. 16 No. 1, pp. 1-13.
- Al-Abrow, H., Alnoor, A., Ismail, E., Eneizan, B. and Makhamreh, H.Z. (2019b), "Psychological contract and organizational misbehavior: exploring the moderating and mediating effects of organizational health and psychological contract breach in Iraqi oil tanks company", *Cogent Business and Management*, Vol. 6 No. 1, pp. 1-28.
- Al-Abrow, H., Fayez, A.S., Abdullah, H., Khaw, K.W., Alnoor, A. and Rexhepi, G. (2021), "Effect of open-mindedness and humble behavior on innovation: mediator role of learning", *International Journal of Emerging Markets*, Vol. ahead-of-print No. ahead-of-print.
- Al-Daneshuar, P. and Ramesh, H.N. (2010), "Information technology and corporate strategies in small and medium enterprises", *International Journal of Management and Strategy*, Vol. 1 No. 1, pp. 1-16.
- Albahri, A.S., Alnoor, A., Zaidan, A.A., Albahri, O.S., Hameed, H., Zaidan, B.B. and Yass, A.A. (2021), "Based on the multi-assessment model: towards a new context of combining the artificial neural network and structural equation modelling: a review", *Chaos, Solitons and Fractals*, Vol. 153 No. 1, pp. 1-17.
- Albahri, O.S., Zaidan, A.A., Albahri, A.S., Alsattar, H.A., Mohammed, R., Aickelin, U., Kou Gang, FM, Jumaah, M.M., Salih, A.H., Alamoody, B.B., Zaidan, Mamoun, Alazab, Alnoor, A. and Al-Obaidi, J.R. (2022), "Novel dynamic fuzzy decision-making framework for COVID-19 vaccine dose recipients", *Journal of Advanced Research*, Vol. 37 No. 1, pp. 147-168.

- Alhamdi, M., Alnoor, A., Eneizan, B., Abdulla, M. and Abdulaali, A.R. (2019), "Determinants of the production system time (jit) on reduce waste: case study in a salsal water company", *International Journal of Academic Research in Business and Social Sciences*, Vol. 9 No. 7, pp. 17-32.
- Alnoor, A., Abdullah, H.O., AL-Abrow, H., Wah Khaw, K., Al-Awidi, I.A., Abbas, S. and Omrane, A. (2021), "A Fuzzy Delphi analytic job demands-resources model to rank factors influencing open innovation", *Transnational Corporations Review*, pp. 1-15, Article in press.
- Alnoor, A., Al-Abrow, H., Al Halbusi, H., Khaw, K.W., Chew, X., Al-Maatoq, M. and Alharbi, R.K. (2022a), "Uncovering the antecedents of trust in social commerce: an application of the non-linear artificial neural network approach", *Competitiveness Review*, Vol. 32 No. 3, pp. 492-523.
- Alnoor, A., Khaw, K.W., Al-Abrow, H. and Alharbi, R.K. (2022b), "The hybrid strategy on the basis of Miles and Snow and Porter's strategies: an overview of the current state-of-the-art of research", *International Journal of Engineering Business Management*, Vol. 14 No. 1, pp. 1-18.
- Alsalem, M.A., Alsattar, H.A., Albahri, A.S., Mohammed, R.T., Albahri, O.S., Zaidan, A.A. and Jumaah, F.M. (2021), "Based on T-spherical fuzzy environment: a combination of FWZIC and FDOSM for prioritising COVID-19 vaccine dose recipients", *Journal of Infection and Public Health*, Vol. 14 No. 10, pp. 1513-1559.
- Andersen, T.J. (2001), "Information technology, strategic decision making approaches and organization performance in different industrial settings", *Journal of Strategic Information Systems*, pp. 101-119, available at: www.elsevier.com/locate/jsis
- Carvallo, J.M.S. (2013), "The crucial role of internal communication audit to improve internal and general market organization of media", *European Scientific Journal*, Vol. 9 No. 1, pp. 357-379.
- Chattopadhyay, U. and Bhawsar, P. (2017), "Effects of changing business environment on organization performance: the case of HMT Watches Ltd", *South Asian Journal of Business and Management Cases*, Vol. 6 No. 1, pp. 36-46.
- Drucker, P.F. and Maciariello, J.A. (1999), *Management*, revised ed, The Drucker Institute, Clare Mount Graduate University, HarperCollins e-books, California.
- Eneizan, B., Mohammed, A.G., Alnoor, A., Alabboodi, A.S. and Enaizan, O. (2019a), "Customer acceptance of mobile marketing in Jordan: an extended UTAUT2 model with trust and risk factors", *International Journal of Engineering Business Management*, Vol. 11 No. 1, pp. 1-10.
- Eneizan, B.M., abdelqader Alsakarneh, A.A., AL-kharabsheh, K.A., Hadi, A.L. and Alnoor, A. (2019b), "An investigation into the relationship between emotional labor and customer satisfaction", *Journal of Management and Business Administration. Central Europe*, Vol. 27 No. 4, pp. 23-47.
- Ensour, H.S. and Alizizi, T. (2014), "The impact of management information systems (MIS) Technology on the quality of Services provided at the university of Tubak", *International Journal of Network Security and Its Applications*, Vol. 6 No. 2, pp. 1-20.
- Fadhil, S.S., Ismail, R. and Alnoor, A. (2021), "The influence of soft skills on employability: a case study on technology industry sector in Malaysia", *Interdisciplinary Journal of Information, Knowledge, and Management*, Vol. 16 No. 1, pp. 255-283.
- Farhangi, A.A., Abbaspour, A. and Ghassemi, R.A. (2012), "Examining the structure relationships of new communication and information technology, organizational structure an firm performance: an analysis of consultant firms (CFE)", *Word Applied Science Journal*, pp. 605-614.
- Farhanghi, A.A., Abbaspour, A. and Ghassemi, R.A. (2013), "The effect of information technology on organizational structure and firm performance: an analysis of Consultant Engineers Firms (CEF) in Iran", *Procedia-Social and Behavioral Sciences*, Vol. 81 No. 1, pp. 644-649.
- Fich, R.B. (2002), "Information Technology in Organization", University of New York, available at: <http://cisnet.branch.cuny.edu/fich/>
- Fidock, J. (2006), *Organizational Structure and Information Technology*, Defence Science and Technology Organization, Australia.

- Franco, M. and Garcia, M. (2017), "Drivers of ICT acceptance and implementation in micro-firms in the estate agent sector: influence on organizational performance", *Information Technology for Development*, Vol. 1102, pp. 1-23.
- GanjiNia, H., Gilaninia, S.H. and Mostafaloo, M. (2013), "Impact of information technology on decision-making process", *University Journal on Management and Social Sciences*, Vol. 3 No. 10, pp. 53-56.
- Haamann, T. and Basten, D. (2018), "The role of information technology in bridging the knowing-doing gap: an exploratory case study on knowledge application", *Journal of Knowledge Management*, Vol. 2 No. 1, pp. 1-22.
- Hadi, A.A., Alnoor, A. and Abdullah, H.O. (2018), "Socio-technical approach, decision-making environment, and sustainable performance: role of ERP systems", *Interdisciplinary Journal of Information, Knowledge, and Management*, Vol. 13 No. 1, pp. 397-415.
- Hamid, R.A., Albahri, A.S., Alwan, J.K., Al-Qaysi, Z.T., Albahri, O.S., Zaidan, A.A., Alnoor, Alhamzah, Alamoodi, A.H. and Zaidan, B.B. (2021), "How smart is e-tourism? A systematic review of smart tourism recommendation system applying data management", *Computer Science Review*, Vol. 39 No. 1, pp. 1-30.
- Harp, A.L. (2011), *Effective Change Communication in the Workplace*, University of Tennessee, Knoxville.
- Herdianti, A., Adityaputri, A.N. and Astuti, H.M. (2017), "Understanding the quality gap of information technology services from the perspective of service provider and consumer", *Procedia Computer Science*, Vol. 124, pp. 601-607.
- Holten, R. and Rosenkranz, C.H. (2008), "Communication in organizations; the heart of information systems", Working Papers on Information Systems, pp. 1-32, available at: <http://spourts.aisnet.org/8-29>
- Hossain, S.F.A. (2019), "Social networking and its role in media entrepreneurship: evaluating the use of mobile phones in the context of online shopping—A review", *Journal of Media Management and Entrepreneurship (JMME)*, Vol. 1 No. 1, pp. 73-86.
- Hossain, S.F.A., Nurunnabi, M., Hussain, K. and Saha, S.K. (2019), "Effects of variety-seeking intention by mobile phone usage on university students' academic performance", *Cogent Education*, Vol. 6 No. 1, 1574692.
- Hossain, S.F.A., Nurunnabi, M., Hussain, K. and Shan, X. (2020a), "Smartphone-based m-shopping behavior and innovative entrepreneurial tendency among women in emerging Asia", *International Journal of Gender and Entrepreneurship*.
- Hossain, S.F.A., Shan, X., Musa, M. and Rahman, P. (2020b), "Social media and increased venture creation tendency with innovative ideas: the case of female students in Asia", in *Handbook of Research on Managerial Practices and Disruptive Innovation in Asia*, IGI Global, pp. 194-209.
- Hossain, S.F.A., Xi, Z., Nurunnabi, M. and Hussain, K. (2020c), "Ubiquitous role of social networking in driving M-Commerce: evaluating the use of mobile phones for online shopping and payment in the context of trust", *SAGE Open*, Vol. 10 No. 3, 2158244020939536.
- Hossain, S.F.A., Shan, X. and Qadeer, A. (2021), "The ubiquitous role of mobile phones in value Co-creation through social media marketing", in *Encyclopedia of Organizational Knowledge, Administration, and Technology*, IGI Global, pp. 2166-2180.
- Huber, G.P. (2009), "A theory of the effects of advanced information technologies on organizational design, intelligence, and decision making", in *Knowledge, Groupware and the Internet*, Routledge, pp. 221-254.
- Jabbar, A.K., Almayyahi, A.R.A., Ali, I.M. and Alnoor, A. (2020), "Mitigating uncertainty in the boardroom: analysis to financial reporting for financial risk COVID-19", *The Journal of Asian Finance, Economics, and Business*, Vol. 7 No. 12, pp. 233-243.

- Khaw, K.W., Thurasamy, R., Al-Abrow, H., Alnoor, A., Tiberius, V., Abdullah, H.O. and Abbas, S. (2021), "Influence of generational status on immigrants' entrepreneurial intentions to start new ventures: a framework based on structural equation modeling and multicriteria decision-making", *Journal of Entrepreneurship in Emerging Economies*, Vol. ahead-of-print No. ahead-of-print.
- Khaw, K.W., Alnoor, A., Al-Abrow, H., Chew, X., Sadaa, A.M., Abbas, S. and Khattak, Z.Z. (2022a), "Modelling and evaluating trust in mobile commerce: a hybrid three stage Fuzzy Delphi, structural equation modeling, and neural network approach", *International Journal of Human-Computer Interaction*, Vol. 38 No. 16, pp. 1529-1545.
- Khaw, K.W., Alnoor, A., Al-Abrow, H., Tiberius, V., Ganesan, Y. and Atshan, N.A. (2022b), "Reactions towards organizational change: a systematic literature review", *Current Psychology*, pp. 1-24, Article in press.
- Kingston, T. (2008). Organisational communication in a strategic change project. Unpublished thesis submitted in partial fulfillment of the degree of Master of International Communication, Unitec New Zealand.
- Krishnan, E., Mohammed, R., Alnoor, A., Albahri, O.S., Zaidan, A.A., Alsattar, H., Albahri, Ahmed Shihab, Zaidan, Bilal Bahaa, Kou, Gang, Hamid, Rula A., Alamoodi, Abdullah Hussein and Alazab, M. (2021), "Interval type 2 trapezoidal-fuzzy weighted with zero inconsistency combined with VIKOR for evaluating smart e-tourism applications", *International Journal of Intelligent Systems*, Vol. 36 No. 9, pp. 4723-4774.
- Lin, L.H. (2011), "Electronic human resource management and organizational innovation: the roles of information technology and virtual organizational structure", *The International Journal of Human Resource Management*, Vol. 22 No. 02, pp. 235-257.
- Lunenburg, F. (2012), "Organizational structure: Mintzberg's framework", *International Journal of Scholarly Academic*, Vol. 14 No. 1, pp. 1-8.
- Mehdi, M.M. (2013), "Use of information technology in decision making: an organizational study of JORHAT City", *Science Technology and Management Journal*, Vol. 2 No. 1, pp. 1-6.
- Nia, K.E. and Roohipour, M.M. (2013), "Management information systems and its relationship with organizational structure", *Interdisciplinary Journal of Contemporary Research in Business*, Vol. 5 No. 1, pp. 1139-1144, available at: ijcrb.webs.com
- Nowduri, S. (2010), "Management information systems and business decision making: review, analysis, and recommendations", *Journal of Management and Marketing Research*, Vol. 3 No. 1, pp. 1-8.
- Parsons, M. and Urbanski, S. (2012), "Recognizing Dysfunction Communications a mean of improving organization practices", *Journal of Communication and Media Technologies*, Vol. 2 No. 4, pp. 1-12.
- Peyman, Y., Mohsen, A.S., Hassan, G., Aboulghassim, F. and Zaman, A. (2011), "The analysis of the relationship between organizational structure and information technology (IT): and the barriers to its establishment at the University of Isfahan from the faculty member's viewpoints", *Higher Education Studies*, Vol. 1 No. 1, pp. 98-104.
- Poon, S., Poon, J., Peters, G., Gupta, N. and Land, L. (2013), "Complementary organization mechanisms – a case study on information technology business value", *European Conference of Information Systems*, Vol. 1 No. 2, pp. 1-13, 18th ed.
- Reddy, G.S., Srinivasu, R., Rikkula, S.R. and Rao, V.S. (2009), "Management information system to help managers for providing decision making in an organization", *International Journal of Reviews in Computing*, Vol. 5 No. 1, pp. 1-6.
- Robson, P.A. and Tourish, D. (2005), "Managing internal communication: an organizational case study, corporate communications", *An International Journal*, Vol. 10 No. 3, pp. 212-222.
- Soltani, M.D., Altaha, H.R. and Taheri, H. (2013), "Studying the relationship between organizational structure and selecting decision making strategy", *International Journal of Economy, Management and Social Sciences*, Azad university, Iran, Vol. 2 No. 1, pp. 824-830.

-
- Taleghani, M. and Mousauian, S. (2011), "Determining the relationship between information technology, and leader style", *Journal of Information Technology Engineering and Applications*, Vol. 1 No. 6, pp. 5-15, available at: www.iiste.org
- Wah, K.K., Omar, A.Z., Alnoor, A. and Alshamkhani, M.T. (2022), "Technology application in tourism in Asia: comprehensive science mapping analysis", in *Technology Application in Tourism in Asia*, Springer, Singapore, pp. 53-66.
- Ward, J.P., Gordon, J., Field, M.J. and Lehmann, H.P. (2001), "Communication and information technology in medical education", *The Lancet*, Vol. 357 No. 9258, pp. 792-796.
- Wijnhoven, A.B.J.M. and Wassenar, D.A. (1990), "Impact of information technology on organizations: the state of the art", *International Journal of Information Management*, Vol. 4 No. 1, pp. 35-53.
- Zandstra, A.W. (2011), "Interpreting the influencing factors within the decision making process between two train safety systems at ProRail", *Delft University of Technology*, Vol. 1 No. 2, pp. 1-11.

Further reading

- Alnoor, A. (2020), "Human capital dimensions and firm performance, mediating role of knowledge management", *International Journal of Business Excellence*, Vol. 20 No. 2, pp. 149-168.

Corresponding author

Raed Alharbi can be contacted at: rhbarbi@tu.edu.sa