

Board-level IT governance, and IT organizational capabilities on organizational performance of Iraqi medium-sized enterprises

NazahanQahatan^{#1,7}, RohaidaBasiruddin², Raihana Mohdali³, Babatunji Samuel Adedeji⁴, Mostafa A. Ali⁵, Ibtihal A. Abed⁶, Abbas Adil⁷

^{#1,2,5,6}Azman Hashim International Business School, UniversitiTeknologi Malaysia Kuala Lumpur, ³Razak Faculty of Technology and Informatics, UniversitiTeknologi Malaysia Kuala Lumpur, ⁴School of Business and Economics, Universiti Putra Malaysia, ⁵Central Statistical Organization, Ministry of Planning, Baghdad, Iraq, ⁶Ministry of Education, Baghdad, Iraq, ⁷Federal Board of Supreme Audit of Iraq, Baghdad, Iraq

Email: ^{#1} nalnasiry@yahoo.com

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Abstract

Medium-sized enterprises (MSEs) in Iraq have had their risk of low performance and failure increased because of greater problems and challenges encountered. The information technology organizational capabilities (ITOC) at the low ebb, and the Board IT governance structures, processes and relational mechanisms not applied by these MSEs have provided basis for their weak performance. Therefore, this study aims to examine the validity and reliability of Board IT governance mechanisms on performance of firms and how IT organizational capabilities mediates the relationship between Board IT governance mechanisms and firm performance. A pilot study of 36 firm participants proves the reliability and validity of the instruments. To ensure the validity and reliability of the study, two steps are undertaken. The first step involves the validation phase concerning the questionnaire, and this was through verifications by experts in the relevant fields. The second step entails the measure of the reliability of the instruments through a pilot study. The analysis of data collected is aided by the evaluation of the Cronbach's alpha coefficient. The results indicate that the Cronbach's alpha value is above 0.8, while the exploratory factor analysis is not less than 0.8, thus, the instruments are reliable and valid, and significant for measuring the constructs. Further studies are required to evaluate the relationship between BIT mechanisms, and ITOC on organizational performance.

Keywords: Board IT governance, IT capabilities, firm performance

1. Introduction

Firm managers now encountering active and digitised business atmosphere gradually purpose to execute IT governance mechanisms and Information Systems (IS) in their firms to convert conventional

business models into digitalized ones[1]. Thus, firms willing to take advantage of business prospects in the present digital age lay emphasis on redesigning customer value intentions through the transformation of their strategy and processes, and adoption of digital technologies for better collaboration with external

stakeholders[2]. No doubt, the value of firms becomes enhanced with the usage of appropriate Information technology (IT) devices [3]. Nevertheless, where there is a lack of adequate IT governance, successful outcomes due to the adoption of IT becomes doubtful. Again, unsteady IT governance promotes loss of firm value because of inability catch in on prospects or availability of innovation and reduction of experience of IT threats. Incidentally, IT issues now receive attention in the boardroom deliberations of firms on a global basis in the current times. Indeed, IT matters now constitute the fiduciary duty of board of directors (BoDs) to reduce IT-related risks and increase business value of the firms[4].

Despite the prominent emphasis of ITG research on executive-level ITG [4, 5], the studies on board-level ITG (ITG executed by the BoDs) is scarce [6]. Yet, current studies totally indicate that B-ITG is a vital constituent of overall ITG [3, 7], thus, enhancing firms' performance [8]. So, the understating of ITG and its impacts becomes limited because of the great attention given to executive-level ITG.

The present study adopts B-ITG [3] to popularize the resource-based view theory and determine the essence of B-ITG involvement in IT governance framework for firm performance [7]. The "B-ITG" is an essential factor in firm's business and IT strategies because of its focus on the firm's capability to enhance knowledge needed to align with the increasing business and technological requirements. Even though ITG relevance in firms has experienced fundamental transformation[6], firms still pursue the promotion of B-ITG involvement in IT governance and accommodate radical technological changes required for the implementation of adequate IT governance [9-11]. According to [9], IT governance framework consists of processes, structures and relational mechanisms of the firm, which enables both

business and IT concerns to discharge their duties in supporting business/IT alignment and creating business value from IT-related business funds.

The focus on IT capability complementarity draws the attention of the current study from IT resource complementarity research. Hence, complementarity of two capabilities is examined, namely B-ITG (an IT capability) and IT organizational capabilities (IT management capabilities). However, overseeing and steering an organization's IT management efforts are the board's responsibilities as suggested by several studies [12, 13]. Accordingly, the argument is that IT management capability plays a special and important role concerning ITG by the board. The latter calls for special nomenclature, investigation, and treatment. So, the interface of organizational capabilities may aid or hamper performance improvements, as integration is required because capabilities do not operate in isolation [14]. It can be significant and informative to consider the relationships that exist when the need arises for the investigations of multiple IT-related capabilities (i.e., interrelatedness of capabilities to influence firm financial performance). The investigation of IT capability complementarity have been articulated in other similar study, for instance [15]. shows how complementarity between two IT capabilities operate to impact competitive performance; and [16] proposes assumptions of moderation of two IT capabilities. Drawing from the latter study, it can be argued that moderation effect is a valid measure of capability complementarity. In specific terms, enhanced complementarity is through positive moderation (super-additive), and suppressive complementarity is as a result of negative moderation (sub-additive).

A review of literature on the contribution of senior IT executives to firm performances reveal. The IT organizational capabilities have currently featured

in a few studies when compared with the IT resources and practices as dimensions of IT-related capabilities [17, 18]. So, to enhance the body of knowledge in the literature, this study attempts to close this gap by also examining, the relationships between Board ITG, IT organizational capabilities and firm performance. Again, pieces of evidence from literature have shown that IT organizational capabilities are yet to receive adequate attention from the developing nations or emerging economies of Asia and Middle East [19]. The question of IT organizational capabilities is mainly concerning the low focus in terms of MSEs do not have e-leaders as well as lack IT and digital skills, in terms of the advanced economies of America, Europe, Australia, Russia and Japan, India, China in the Eastern bloc [17].

As a result of deficiency in current technological resources, most MSEs have not fully engaged the B-ITG frameworks [20]. Medium enterprises presently encounter challenges about growth in their performances concerning issues like shortage of funds, cash flow, inventory management, and satisfying client requirements (21). Specifically, insufficient guarantees and financial data hamper ability to obtain loans from banks. MSEs that use conventional [21]. structure in the developing nations compared to those in the developed countries are still far behind in the scheme of events [22]. Therefore, the transactions need to be correctly and efficiently processed based on the available performance data through the execution and comprehensible engagement of B-ITG [23]. In the Iraqi context, there is a weakness in these factors, which could influence performance as reported in the previous studies. Consequently, the use of BITG is essential to improve the performance of MSEs [20, 21, 23-26]. The current study argues that with the use of B-ITG effectively, and the proper management of IT organizational capabilities, the performance of MSEs will experience

a big boost. Therefore, the relevance of the current study concerns the evaluation the low level of studies about the relationships among the previously stated three elements connected to developing and developed countries. Therefore, the present study aims to fill the above gap by determining the effect of BITG on MSEs' organizational performance through the evaluation of the validity and reliability of the related factors of processes, structures and relational mechanisms of the firm as well as the IT organizational capabilities.

A critical factor for the growth of MSEs is the B-ITG required to improve on business value and lessen IT-related threats. Therefore, the lack of B-ITG frameworks creates value reduction due to lost prospects or innovation delay and enlarged exposure to IT threats that can hamper organizational capabilities and firm performance. So, the issue of B-ITG frameworks (B-ITG Structure, B-ITG Processes, B-ITG relational mechanisms) becomes more relevant to increase further the ability of MSEs to become more capable and active; hence, cause improvements in firm performance[8, 10, 27, 28]. This study endeavour to close the gap concerning the non-availability of B-ITG mechanisms for MSEs in Iraq by calling for the institutionalization of B-ITG procedures to provide for better firm evaluation and performance. Thus, the inclusion of the B-ITG procedures is essential, more so, when the International Financial Reporting Standards (IFRSs) are available concerning the small and medium-sized firms globally[29].

Specifically, where the deployment of competitive strategies is, the potency exists for Board-IT Governance, and IT organizational capabilities to boost financial and non-financial performances [30, 31]. Additionally, the findings of these studies extend the scope of previous research since the current study

covers a context not well represented in the Board- IT Governance literature and maintaining a departure from earlier studies that focused on multinationals and large firms by examining MSEs as our unit of analysis.

2.Theoreticalunderpinnings

Based on the review of literature on B-ITG Structure, B-ITG Processes, B-ITG relational mechanisms and IT organizational capabilities, in line with agency, stakeholder, resource-based view [7, 9, 32, 33]and institutional theories on how to enhance firm performance, especially with reference to the medium-sized outfits, motivated the design and development of a conceptual model for determining the effect of institutional factors on firm performance[6]. For instance, this study has with the aid of the theories shown that the relationships among the variables were not direct alone; it was also possible to establish the indirect effects through the mediation effects of a IT organizational capabilities in the relationship between B-ITG Structure, B-ITG Processes, B-ITG relational mechanisms and firm performance of MSEs.

The agency and stakeholder theories have been proved to be applicable concerning B-ITG Structure, B-ITG Processes, B-ITG relational mechanisms in medium-sized firms [6]. The agency costs can be reduced when related to medium-sized firms while the management is also made to be conscious of her duties of meeting the varying needs of the different interest groups [32]. This situation was earlier concerning the large and listed firms. The awareness on the part of the board and management of these theories would help in recognising the presence of conflicts and how to resolve them professionally alongside the ability to network effectively[34]and gain from having a

competitive advantage. Since the unit of analysis are firms, the B-ITG mechanisms at firm-levels are even applicable concerning MSEs.

Also, the stakeholder theory provides a social perspective to the realisation of the objectives of medium-sized firms in the light of employee satisfaction, and firm reputation. Also, the stakeholder theory is supportive of IT governance mechanisms to enhance firm performance with the responsibility to satisfying the individual expectations of the numerous parties whether financially or non-financially[35]

Though the RBV provides support for explaining the relevance of human capital, structural capital, relational capital, and spiritual capital as resources required by large and listed firms to enjoy a competitive advantage, this theory is not applicable in the case of MSEs due to the lack of full engagement and underutilisation of the resources[36]. Again, the approach is not relevant concerning industry leadership, competitiveness, innovation. Another reason is that of low capabilities. Nevertheless, the approach favours the effect of ITOC on FP because the reduction in the cost of debt and access to finance are traceable to firms embarking on creation of business value and reduce IT-related risks, which translates to the effective utilisation of resources and capabilities[37].

The institutional theory supports board's involvement in IT governance on firms, with encouragement for focus on internal organisational mechanisms, because the latter ensure firm performance [6]. This theory provides that governance matters issues gain prominence with support for the introduction of board's involvement in IT governance in this study. Therefore, the rules, regulations, laws, beliefs, covenants, and agreements where decisions on

financial and non-financial issues are concerned to have theoretical support[38]. In a nutshell, institutional arrangements affect the attitude of the board and management as well as the outcomes experienced by firms [39].

In sum, this study has demonstrated the need for the integration of theories to back up research efforts, because this will promote the idea of delving more into multidimensional studies that will boost the application of theories to enhance the body of knowledge in the future [40].

3.Board ITG

The term IT governance has origins in corporate governance. IT governance has a close relationship with IT management, but are different concepts. The first time the term IT governance was used in IT literature was in 1991 from a definition by[41], who described IT governance as the means used to describe how IT mediates business relationships by of an IT-based system. According to [42], the definition of B-ITG in academia is not yet a matter of consensus, but in general, BIT governance hopefully can constitute a constituent part of corporate governance (CG), be present in the alignment between the adoption of IT resources and the strategic aim of an organization and be a responsibility of the organization as a whole..

B-ITG is a duty of the BoDs and an element of CG [43]. B-ITG encompasses decision-making and accountability rights, so that desirable behaviors are encouraged by the IT sector [43, 44]. IT governance aims to make sure that investments made in technology help companies in organizational goals, thus adding greater value to the organization's business [45]. For [46], CG plays a decisive role in the development of B-ITG, with B-ITG being a

subordinate of CG. BIT governance as the duty of the company's the BoDs and cannot be solely under the responsibility of the IT team, because it deals with the definition of processes that can guarantee the support to organizational goals and strategies.

Effective B-ITG is achieved through a combination of structural, procedural and relational mechanisms [47-49]. In the context of MSEs, relational mechanisms are already present in several situations, making their implementation simpler and more context-sensitive [50]. Several studies indicate a relationship between B-ITG and greater organizational performance [6, 44, 45, 51]. In this way, efficiently managing the IT resources is critical to the successful existence of organizations.

Structural mechanisms of B-ITG involve how the organization is structured as to the authority of IT decision-making. For[52], in small and medium-sized environments with few resources, physical, human and financial, the creation of committees and administrative councils seems to be beyond the reality of everyday life. However, it is possible to think of the creation of these mechanisms of structural governance, once the organization starts to support them, both financially and structurally. Among the process-related B-ITG mechanisms, the literature supports the use of IT indicators, strategic alignment, value delivery, resource management, risk management, and performance measurement[53, 54]. Finally, relational B-ITG mechanisms include vital communication concerning IT from and to the BoDs. This participation can take place from the managerial capacity of Chief Information Officer (CIO) consistent link with the board, mutual learning occurrences between IT and the business and communication between the parties[50, 51, 55]. The link between structural and procedural mechanisms of B-ITG is based on relational mechanisms [45].

[6, 51] cite organizational performance as one of the consequences of B-ITG. For [56] B-ITG is about strategic control of the impact IT has on the organization and the value it brings to the business. Along the same lines, [44] add that it is necessary to efficiently manage IT resources to increase the business value, although this is a difficult task. B-ITG is as important for MSEs as it is for large companies [42]. The need to successfully manage a firm, earn expected returns, and use IT resources to increase business value, make B-ITG a vital issue and yet, a difficult task [43]. According to [57], MSEs have specificities, among them are environmental, organizational, decision-making, informational, psychological and sociological. MSEs operate in local markets, have greater flexibility to adapt to changes, but have resource constraints. However, it is important to emphasize that, despite their specificities, MSEs are not homogeneous, characterizing patterns different uses of technological resources [43, 50]. This perception of specificities is shared by Both studies cite specifically that a different approach to B-ITG is required for MSEs, given the specificities that separate them from large organizations.

The RBV of the firm [36] and application of the capability complementarity concept [37] constitute immense relevance in this study. The above theoretical base opines that B-ITG qualifies as IT capabilities to complement other capabilities [8]. The other capability emphasizes on firm-level IT organizational capability, which aids a firm to engage IT tools and devices to improve on basic processes and procedures [58]. Three significant reasons ensure the choice of this complementary capability. First, the IT operational relevance improves firm performance [59, 60]. Second, IT organizational capability reasonably exists in all forms of organizations, despite a lack of the IT unit. Third, IT organizational capability readily has impact from, and complements

B-ITG. Consequently, IT organisational capability ensures B-ITG influences a higher financial performance.

Because of the numerous difficulties encountered, the MSEs require support of B-ITG to enhance their performances and stabilize the current system used by firms [38, 61]. Thus, several MSEs face the threats of folding up, due to lack of managerial expertise and presence of poor management attitude [62, 63], systems deficiency in meeting the users' needs [64], knowledge failures and inadequate staffing, institutional feebleness, compromise of quality [38, 65], scarcity of resources [66], fragile economic circumstances/shortage of capita [20, 65], less organizational support, as well as lack of collaboration, networking, and technical competencies [38]. Furthermore, gathering of related data for successful MSEs performance would motivate reliance on B-ITG to mitigate the general challenges MSEs face concerning readiness of reliable data [20]. Therefore, this study involves an understanding of the accounting and non-accounting information systems required to enhance MSEs performances. The latter involves the investigation of the success factors and current issues needed to increase organizational performance by focusing on B-ITG. This study provides a probable information source and orientation for policy makers and MSEs managers in Iraq and other developing countries, as well as, potential scholars involved with emphasis on organizational performance related issues.

4. Conceptual framework

Figure 1 below is to explain the relationships among the BITG Structure, BITG Process, BITG Relational mechanisms and IT organizational capabilities on firm performance. IT organizational capabilities is the mediating variable.

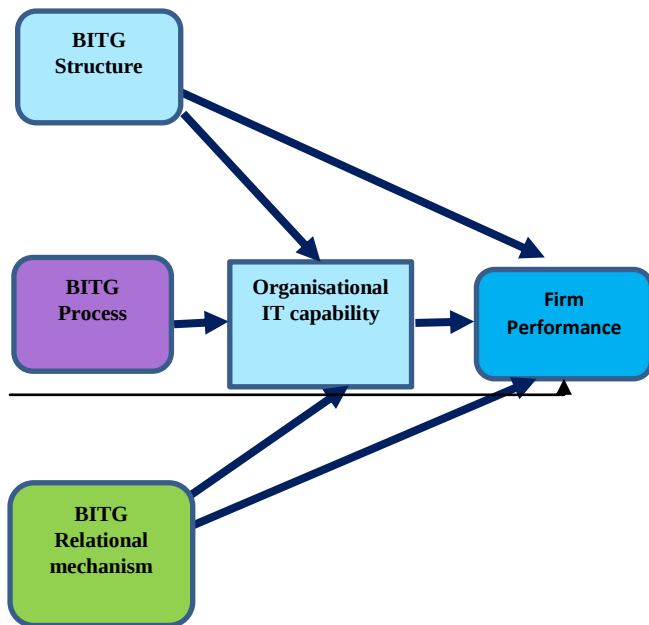


Figure 1: Research Framework supported relationships among the study variables

5. Methodology

To investigate the influence of B-ITG structural, procedural, relational mechanisms and, IT organizational capability on organizational performance of Iraqi MSEs, the measurement of the reliability and validity of the questionnaire is undertaken in this study. The need to decrease respondents' bias and measurement errors, and facilitate data collection, due to large sample size or coverage of a large geographical area provide the justification for a questionnaire design. Besides, a questionnaire ensures the bases for the accurate analysis of data, and a full explanation of the numerous types of answer sets [67]. The steps involved in this study include adaptation and adoption of items from previous studies, sending of questionnaire to the experts, questionnaire validation, adjustment of the questionnaire in line with the opinion expressed by the

experts. Others are the administration of the questionnaire on 55 participants of MSEs, reliability and validity instrument measurement using SPSS 23, refinement of the questionnaire based on the results achieved.

5.1 Questionnaire design

The questionnaire validation for this research involves two steps (Appendix A) before its administration on the MSEs in Iraq. Experts engaged in the universities and in related fields are involved in the first step. Five out of the seven experts involved work in Iraqi universities. In the second step, three managers from Iraqi MSEs also took part in the questionnaire validation.

To determine the extent of understanding of the participants, the language of the questionnaire is evaluated concerning the wording and re-wording of the items to check for any omissions, syntax errors, font and font size mistakes and duplications of words and tenses. However, based on the recommendations and feedback from the experts, the questions are correctly amended before the administration of the questionnaire. The two steps involved as above, aided the determination of the content validity and face validity, where validity is to ascertain the suitability and appropriateness of the measures undertaken by the researcher. The reliability of the instrument based on experts' opinion in the field is to ensure the generalization of the achieved outcomes [68]. Content analysis is a measure of the judgment of experts in a study area based on face or content analysis. Content analysis provides a mechanism to create interesting and theoretically essential generalizations from the original data with minimal information loss [69]. while face validity entails a measure of the researchers' explanation of the concepts connected to

the systematic structures that require measurement [70].

5.2 Pilot study

The popularly adopted reliability measurement test of any pilot study type of questionnaire, as seen in various studies is the Cronbach's Alpha test [71]. As indicated by [72], the Cronbach's Alpha test possesses some values between the range of 0 and 1; a greater level of range indicates reliability value. 0.9 values and above are considered excellent, while 0.8 values and above are considered good, then 0.7 values and above are considered acceptable. However, 0.6 values are considered questionable, while values below 0.6 are considered poor. The pilot study provided some data, which were analyzed with the use of the "Statistical Package for Social Sciences," generally known as (SPSS v.23) for the identification of each factor values in Cronbach's Alpha.

The pilot study is to recognize possible issues that impact the reliability and validity of data involved, through exploring, investigating, refining, and testing the measurement tools and procedures in achieving the anticipated results. A pilot study ensures the testing and improvement of the questionnaire before carrying out a formal study is the view expressed by several researchers [25, 73]. So, in the present study, the pilot study ensures that the design selected was acceptable before undertaking the final study. The ability to ensure consistency, provides the reliability of a measuring instrument. Therefore, the collection of data from managers/owners of Iraqi MSEs involves the usage of self-administered printed questionnaires. Questionnaires are administered on fifty-five participants. With only 36 questionnaires collected from MSEs, the number of respondents for this study is considered suitable for a pilot study.

Concerning the pilot study, the result showed that all the items are reliable since it resulted in a more than 0.8 value in the case of the Cronbach's alpha reliability test.

5.3 Demographic information

The demographic information in Table 1 below, shows the profile of this study's population as summarised in this section to provide an overview of the respondents that participated in this study. Demography of the study population indicates that the gender composition of the respondents is 77.8 male while the proportion of female is 22.2 of the respondents. Most of the respondents are in the age bracket of Over 56 years old consisting of 50% of the study population. Furthermore, 80.6% of the respondents receive education at the Bachelor Degree. Mostly, 61.1% of the respondents are Executive Board. Mostly, there are 41.7% of the study population have experience Above 20 years. In addition, 25% of the respondents are Manufacturing and oil and gas. The result shows that the MSEs are able to understand and execute IT governance mechanisms and Information Systems (IS) in their firms to convert a conventional business model into digital one through provision of training in digital skills.

Table 1: Demographic information

Measure	Categories	Frequenc y	Percen t
GENDER	male	28	77.8
	female	8	22.2
AGE	26 – 35 years old	2	5.5
	36 – 45 years old	6	16.6

	46 – 55 years old	10	27.7
	Over 56 years old	18	50
EDUCATION	Bachelor	29	80.5
	Master Degree	5	13.9
	Professional	2	5.6
POSITION	Executive Board	22	61.1
	Non-Executive Board	6	16.7
	IT Manager	8	22.2
EXPERIENCE	6-10 years	2	5.6
	11-15 years	6	16.7
	16-20 years	13	36.1
	Above 20 years	15	41.7
INDUSTRY	manufacturing	9	25
	services	5	13.9
	agriculture	4	11.1
	communication	4	11.1
	construction	5	13.9
	oil and gas	9	25

ascertained to evaluate the quality of the instrument, via a large alpha, which provides the items' true score. However,[76]suggested the following rules of thumb: greater than 0.9= Excellent, higher than 0.8= Good, more than 0.7= Acceptable, not less than 0.6= Questionable, more than 0.5= Poor, and less than 0.5= Unacceptable.

The SPSS version 23 aids the analysis of the data collected from the pilot study to evaluate the values of all the factors concerning the Cronbach's alpha. No changes are required for any of the items in the pilot study based on the findings of the analysis. The Cronbach's alpha for each of the factor items are as shown in Table 2. The pilot analysis shows that all the variables have above 0.80 scores as shown in Table 2 below. Therefore, there is an acceptance of all the factors.

Table 2: Cronbach's alpha and number of items.

factor	Cronbach's Alpha	N of items
Board IT Structures (S)	0.920	15
Board IT Processes (P)	0.909	10
Board IT Relational Mechanism (RM)	0.914	11
IT Organization Capability (ITOC)	0.882	8
Financial Performance (FP)	0.908	5
Non-Financial Performance (NFP)	0.847	7

5.4 Results

The researcher gave attention to various type of reliability tests. The Cronbach's alpha and the Bartlett's test of sphericity provide the overall method to evaluate the reliability of the pilot study instrument. The highest alpha value of 0.90 is the acceptable alpha value reported about the current study [74]. Therefore,[75](78) recommend that the measure of the internal consistency of coefficient alpha need to be

6. Discussions

The current study is about the determination of the validity and reliability of the usage of questionnaire on related factors needed to improve MSEs performance. The study draws its motivation from the reason associated with the low performance of MSEs in Iraq. Therefore, a necessity arises for the evaluation of the influence of the usage of BIT governance mechanisms, and IT organizational capability on organizational performance. The low level of the implementation of BIT governance mechanisms among the MSEs, based on previous studies, indicates one possible cause for their weak performances [25]. IT and digital capabilities are still at the low ebb with a negative impact on the development and growth of MSEs concerning technical and managerial matters [19].

Significant economic growth and national development are as a result achieved through the MSEs model. Besides, the creation of a good strategy can increase prosperity and employment opportunities. The measure of the validity and reliability of all the factors is to ensure that the participants' responses are consistent. The findings from this study revealed that the reliability of the instrument provides evidence concerning the implementation of BIT governance mechanisms, and IT organizational capability on the organizational performance of MSEs in Iraq. A tool of this nature is yet to be examined in the literature, and in particular, a measure of these factors is lacking in the studies concerning the Middle East[17, 19]. Therefore, this study shows that the instrument is valid and reliable for the assessment of the usage of BITG structural, procedural and relational mechanisms to improve the performance of MSEs.

7. Conclusion

The current study provides reliable instrument to ease the collection of data for the related factors required by the decision-makers to determine and improve the organizational performance of the Iraqi MSEs. The findings show that instrument based on the Cronbach's alpha test is reliable and error free. The pilot study shows values greater than 0.8 scores for all the factors. The validity and reliability tests indicate that questionnaire usage can lead to final model validation. Therefore, the questionnaire is designed to provide more evidence concerning the research framework related to BIT governance mechanisms, IT organisational capability and organizational performance as well as the relationship between these factors. The above suggest a need to test a larger population of Iraqi MSEs to further validate the hypotheses concerning the proposed research framework. The results from the current study is to guarantee an appreciation of the performances of MSEs and their activities. For future studies, researchers are to focus on the extent of the relationship between BIT governance, IT organisational capabilities and performances of MSEs in Iraq. Also, digital skills acquisition is needed because of the swift technological changes, as well as the global adaptation to the technological developments.

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Table 3: Summary of measurement items for Board IT governance

Variable	Measurement Item	Source
structures	(1) Directors are resourceful in IT devices. (2) Directors are involved with overall IT budget sessions. (3) Directors connect on matters relating to IT. (4) Directors are involved in providing IT policies. (5) Directors are conversant with the overall IT strategy/vision of the organization. (6) Directors are aware of the IT risks to which the organization is exposed. (7) Directors have received formal	Héroux and Fortin, 2018; Jewer& McKay, 2012

	training in IT. (8) Directors have experience in the general management of IT within the organization. (9) Directors have worked directly in an IT role within the organization. (10) The IT strategy committee for the board of directors ensures IT is a regular agenda item and reporting issue for the board. (11) The IT strategy committee for the board of directors provides strategic direction and the alignment of IT and business issues. (12) The IT strategy committee for the board of directors provides direction for the sourcing and use of IT resources, skills, and infrastructure to meet the strategic objectives. (13) The IT strategy committee for the board of directors provides direction to management relative to IT strategy. (14) The IT strategy committee for the board of directors is comprised of independent members (from outside the organization). (15) The IT strategy committee for the board of directors' addresses IT	
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	risks.	
Processes	(1) A formal planning process is used to define the IT strategy. (2) A formal planning process is used to update the IT strategy. (3) IT budgets are used to control and report on IT activities/investments. (4) There are IT performance measures (e.g., organization contribution, user orientation, operational excellence, or future orientation). (5) Methodologies are used to charge IT costs back to business units. (6) There are formal agreements between business and IT service about IT development projects or IT operations. (7) Processes are used to monitor the planned business benefits during and after implementation of the IT investments/projects. (8) Define objectives and expectations, such as accountability and responsibility. (9) Are clearly written so that employees impacted by IT projects	Héroux and Fortin, 2018

	can understand them. (10) Provide these employees with extensive guidance regarding how to manage IT projects.	
Relational mechanisms	(1) The Directors/officer in charge of IT articulates a vision for Its role in the organization. (2) The Directors/officer in charge of IT ensures that the vision for Its role is clearly understood by managers throughout the organization. (3) There is job rotation (IT staff working in the business units and business people working in IT). (4) Directors and IT people are physically located close to each other. (5) Directors are trained in IT or IT people are taught about business. (6) Systems such as the intranet are used to share and distribute knowledge about the IT governance framework, responsibilities, tasks, etc. (7) Business/administrative managers act as in-betweens for business and IT. (8) Senior business and IT	Héroux and Fortin, 2018

	management act as “partners.” (9) Senior business and IT management informally discuss the organization’s activities and its role. (10) Internal corporate communications regularly address general IT issues. (11) There are campaigns explaining the need for IT governance to business and IT people.	
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Table 4: Summary of measurement items for Firm performance

Variable	Measurement Item	Source
Financial Performance	(1) Our organization profit increase gradually within the last 3 years. (2) Our organization sales volume increase gradually within the last3 years. (3) Our organization return on investment increase gradually within the last 3 years. (4) Our organization return on assets increase gradually within the last 3 years. (5) Our organization market share increases	(Henri, 2006, Nawaz et al., 2017)

	gradually within the last 3 years.	
Non-Financial Performance	(1) The number of new products in my organization increase within the last 3 years (2) Our organization market development increases significantly within the last 3 years (3) Our organization quality of product/services of organization increase within the last 3 years (4) Our organization employee commitment or loyalty to the organization increases within the last 3 years (5) Our organization employee productivity increases within the last 3 years (6) Our organization personnel development increases the last 3 years (7) Our organization employee job satisfaction increases the last 3 years	(Teeratansirikool et al., 2013, Nawaz et al., 2017)

Table 5: Summary of measurement items for IT organizational Capabilities

Variable	Measurement Item	Source
IT organizational Capabilities	(1) Management has strategic information systems plan in place to monitor and update information systems. (2) Strategic information systems plan forms the	Turel 2014

	basis for the annual plans, and long-term budgets and the prioritization of information. (3) Management has appropriate procedures established to ensure the organization is aware of technology trends, to determine when and how it can better position itself. (4) Management applies key performance indicators and drivers of the IT department benchmarked against industry standards. (5) Management defines and monitors the key indicators to manage the performance of the organization's third-party information technology service providers. (6) Management has identified the required information technology expertise. (7) Management search for top information technology needs to attract highly talented personnel. (8) Management has appropriate procedures to address information technology employee turnover, training and project assignment.	
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