

The Mediating Role of MIS Efficiency in the Relationship between Business Processes and Operational Excellence

Mohammed Abed Al-Hayy Salam Al-Dalaien ¹, Ahmad Abed Al-Hayy Salam Al-Dalaien², Bilal Issa Abu Zaid ³, Firas Mohd Al-dalaien ⁴, Alshawabkeh Abdallah Mohammad Kamel ⁵, Alomari Hussam Mohammad Ali ⁶

¹, University Madanah International, businesses Administration management, email: mohammed.aldalaien@yahoo.com

², College IT, UNITEN University, ahmad.abed200826@gmail.com

³, Director of Corporate Communications and Media / Spokesperson for the JIC, email: bilal.abu-zaid@jic.gov.jo

⁴, Finance, University of Tunis, El Manar email: dalaeen.feras@yahoo.com

⁵, College Businesses Administration management, accounting, The World Islamic Sciences and Education University, Email: shawabkah11@gmail.com

⁶, College business Administration management, accounting, email: Hosamomaristudy86@gmail.com

<p>Article history Submitted: 2 June, 2021 Revised: 22, 29 June, 2021 Accepted: 2 July, 2021</p>	<p>Abstract The importance of utilizing of Management Information System (MIS) is increased to manage information, improve the business processes (BP), and enhance the operational excellence (OE) of the organizations. This study aims to explore the role of MIS efficiency in improving the BP and the OE of Jordanian banks. The data of this research is collected from 159 managers in two Jordanian banks. In order to address the research aims, the SPSS and AMOS are utilized to conduct several analyses such as demographic analysis, confirmatory factors analysis, and descriptive analysis. The results show that the efficiency of MIS would be designed based on the business processes such as information workflow and working functionality. The MIS efficiency includes many dimensions such as throughput, transaction speed, system availability, information accuracy, and response rate. The efficient MIS functions plays important role in improving the OE of the banks such as working innovations and services quality. This research provides useful information about the relationship between the MIS functions, business processes, and operational excellence in the banks.</p>
<p>Keywords: <i>MIS Efficiency,</i> <i>Business processes,</i> <i>Operational excellence,</i> <i>Banks,</i></p>	

1. Introduction

Organizations are nowadays facing unprecedented challenges to improve their organizational performance. Competitive is increasingly high and the effect of globalization are impacting the business performance [1], [2]. With the dynamic nature of the marketplace and the level of complexity, this represents an ongoing journey, requiring a focus on the fundamentals of Operational Excellence (OE) [3]. The definition of OE is best expressed by focusing on both the ongoing aspects as well as the desired outcomes [4]. The people excellence is one of the critical components of OE [5], [6]. The excellence of people contributes the quality improvements and the innovations in the organizations, which play important roles in improve the competitive advantages of the businesses [7].

For effective operational excellence, the management of business process is necessary to manage all resources in the organization (such as asset, people, and information) [8], [9]. The organizations must constantly reconsider and optimize the way they do business and change their information systems and applications to support evolving Business Processes (BP) [10]–[15].

BP may be understood to be the way in which work is organized, co-ordinate and focused to produce the services [16]. As such, BP may be used to describe the flow of materials, information or knowledge. BP may also be understood to be the way in which management chooses to co-ordinate work through the use of workflow information and the functionality [17]–[19]. The functionality is about manage the working responsibilities of the employees, while the workflow is about manage the information flow between the employees in the context of working services. The management of BP is

necessary to manage the overall operations in the organization according to effective processes. The necessity of BP management grows when the organization workflow and functionality is complex and nested [20], [21]. IT is considered one of the most important enablers of process change. Together, processes and information technology can be seen as a new industrial engineering that may revolutionize the way in which organizations operate [6], [7], [22], [22], [23]

Most of the advocators of the business process management highlight the importance of the role that Information Technology (IT) plays in the business process [24], [25]. Many argued that IT should be seen as an enabler of organizational change rather than as a tool to implement business processes. The initiative to move towards BP in many cases originates from the IT departments. In last two decades, Management Information Systems (MIS) are used to manage information, make better decisions and improve the execution of a company's BP [26]–[29]. MIS can be defined as computer hardware and software that manage the organizational flow between internal organization sectors (such as departments and workers) or between organization and other organizations in order to accomplish various working activities [30]. MIS enhance BP because they cannot only be used to increase the efficiency of existing processes, but also to enable new processes that are capable of transforming the way in which an organization conducts business [31].

The necessity to evaluate the functions of MIS has emerged from the importance of MIS efficiency of work processes in an organization, causing rapid growth of demands in terms of resources performances in Information System. Evaluation of Information System performances means evaluation of performances in hardware, software, computer networks, data and human resources [32]. Efficiency of information systems would be measured based on many dimensions such as response time, accessibility, characteristics of used computer language, realization of user's demands, correction of mistakes, accuracy of output, and promptness of output [33] [34] [35]. To sum up, this research focuses on review the role BP management on OE through useful MIS efficiency in banking industry. The banks represent the major financial hub in any country due to importance of banks assets and services for the growth of country economy (Levine, 2004). There is wide number of banks services such as provide loans for customers, money transferring, operate the customers and government capitals, help the government and organizations to distribute the employees' salaries, and involve the stock exchange in the country. The OE of banks services is necessary to assure the services quality, reduce the operational costs, avoid the operational mistakes, and deliver the services in right time. Thus, the banks could increase their profits and assure the customers satisfactions.

The next section presents the literature review of OE, BP management, and MIS in the banks. Section 3 presents the proposed conceptual model. Hypotheses testing is presented as well as the result, discussion, and conclusion.

2. Literature Review

2.1 Theoretical Considerations

Management by objectives (MBO) theory primarily focuses on the definition of organizational objectives that management relays to the members of the organization to decide upon their sequential achievement [36]. This enables management to tackle the objectives in an organized way in order to achieve more productivity in the work environment and it assists the members to clearly be acquainted with their achievements, with one objective at a time, supporting a positive work environment [37].

In an ideal workplace, employees are involved with setting the firm goals and selecting the action to be taken in order to be more inclined towards achieving the main goal [38]. The MOB theory cycle [39] indicates that the set of organizational objectives should be passed down to employees as sequential objectives. Such passing down of objectives have to oversee in their achievement. On the basis of such oversight, the employees' performance can be measured, after which the employees can be rewarded based on their performance prior to distributing the next business objectives.

There are three main segmented directions to the MBO cycle namely, 1) business processes (e.g., distribution of objectives), 2) business management (e.g., monitoring objectives) and 3) operational excellence (e.g., evaluation of performance). In this regard, MIS can be used for the monitoring of business processes that employees achieve, while measuring the performance of the employees along with the objectives of the organization.

In addition to the MBO, Total Quality Management is another important theory that is reviewed and presented under this section. The focus of TQM is the development of an organizational system that promotes the members' cooperation and learning towards implementing management practices process, and ultimately, towards the processes, products and services ongoing improvement, and the fulfillment of employees, customer satisfaction and survival of the firm [40].

In the processes and systems changes, top management has a key role in leading the rest of the organizational members [41]. Leadership, in this case, ensures the quality management success with the top management creating and communicating a vision for the firm's ongoing enhancement [20], [21]. It is the responsibility of top management to address quality problems, and this is handled by establishing clear standards of work to the employees and work methods for their achievement. These also involve a suitable working environment that is devoid of fault-finding, blaming or scare tactics. In sum, the TQM theory primarily focuses on managing business processes in an effective way with the help of systems to reach business operational excellence, as a result of which products and services are enhanced.

2.2. Business Processes Management.

Business Process Management (BPM) the management model or structure of the working processes in the organization in order to achieve excellence or the best outcomes. The conduction of BPM should include the identification of the main processes and its documentation, in order to select the improvement strategy and the possible implemented changes to the processes. BP use information to tailor or complete working activities. Information, unlike resources, is not consumed in the process rather it is used as part of the transformation process [3], [35], [42], [43]. Information may come from external sources, from customers, from internal organizational units and may even be the product of other processes. In many organizations the term workflow is used to refer to an automated BP, which means that the coordination, control and communication of activities is automated, but the activities themselves can be either automated by information systems or performed by people [44].

The BP functionality is much related to workflow, a functional business is the working tasks and responsibilities that assigned to worker, teamwork, or department [45]. A functional business orientation organizes a company along functional lines, such as sales and production [1]. A process orientation means that the company focuses on business processes, such as order processing or strategic planning. In each case, the companies optimize their activities, either within the functional units or for each process. The main difference is that optimizing one functional unit may harm another function but optimizing the business processes across organizational lines helps the whole company [46].

2.3. Management Information System

The utilization of information technology has been magnificently increased in service industries, particularly, the banking industry, which by using Information Technology (IT) related products such as internet banking, electronic payments, security investments, information exchanges [35]. Using IT facilities, the financial organizations can deliver high quality services to client with less effort. Management Information System (MIS) is one of the major computer-based information systems [47]. Its purpose is to meet the general information need of all the managers in the firm or in some organizational subunit of the firm. Subunit can be based on functional areas on management levels [22]. The importance of MIS comes from the benefits that generated by that system such providing useful information in timely manner, improved labour productivity, cost savings, providing the information without any delays and mistakes, and improved the management of work [48]. [7] argued that the main issue of MIS system in organization is how to manage the software and hardware equipment in organization to assure the organizational performance. The idea here is not only about install MIS in organization but it is about managing MIS efficiency according to organization structure and information flow between various sectors in order to enhance the business processes and improve the operational excellence of organization. According to [49] there are two directions of MIS efficiency which are the efficiency. Efficiency is definitely related. However, success in one area does not necessarily imply success in the other. Efficiency MIS metrics focus on the technology itself such as throughput, transaction speed, and system availability. While these efficiency MIS metrics are important to monitor, they do not always guarantee effectiveness.

The following are the mercies of MIS efficiency [2], [5], [50]: a) throughput: the amount of information that can travel through a system at any point in time; b) transaction speed: the amount of time a system takes to perform a transaction; c) system availability: the number of hours a system is available for users; d) information accuracy: the extent to which a system generates the correct results when executing the same transaction numerous times; e) response time: the time it takes to respond to user interactions such as a mouse click.

2.4. Operational Excellence

For businesses and indeed any organization to be successful in the long term, they must be engaged in a relentless quest to make things better. Failure to make this an organizational priority will inevitably result in organizational decline (Khanam et al., 2016). OE is an all-embracing approach for optimizing everyday operations, in configuration with the organization's strategic objectives and customer expectations [51]. It is a philosophy of leadership, teamwork and problem solving that leads into constant improvement throughout the organization by looking at the wishes of the customer, empowering employees, and maximizing on the existing activities in the process [52]. OE includes two important practices; continues improvements of services and employees.

Innovations are adopted by organizations in order to improve the level of services delivered to various users and with the broad aim of increase their profitability and market share [53]. Knowledge on the processes of innovation adoption and the characteristic of innovative organizations is evolving in various sectors of industries [54]. For the creation of valuable output and achievement of operational excellence, specific and distinctive competencies and resources of the firm are bundled and revitalized [55]. The product and service quality improvement could be enhanced through competitive advantage along with the cost and production reduction, the service and product speedy delivery and be able to provide accuracy in the production and services [56]. Quality of services and products can be achieved by adding unique attributes to products to enhance their excellence so as to benefit customers [6].

3. Proposed Conceptual Model

Based on the literature review, there are various theories support the relationship between the researches variables; business processes, management information system, and operational excellence. Theories such as MBO, TQM, and IO are aimed to achieve the operational excellence in organization through manage the business processes using systems like information system. Theoretically, the information workflow and working functionality are important variables of business processes, the efficiency is important variable of information system, and the most important variables of operational excellence are the innovation and continue improvements of services.

However, there are two main research gaps are identified, the first gap of this research is the limitations of conducted works on the impact of MIS efficiency on the enhancement of BP management in the banking sector. There is few research conducted to investigate this impact in the banks. The second research gap is the studies limitation on the impact of BP management on OE through MIS efficiency in banks. The operational excellence could be improved through manage the information workflow and employee’s functionality supporting effective and efficient management information system.

Thus, it is important to examine the role of business processes on operational excellence through management information system functions in the banks. Figure 1 illustrates the theoretical framework of this study. The performance management of BP variables (workflow and functionality) could be evaluated based on the efficiency of MIS function. Therefore, the role of the enhancement on PB management on OE variables could be investigated in the banks. This investigation offers good understanding of the situation of MIS in the banks and the requirements that needed to enhance the MIS efficiency in order to enhance the PB management and OE.

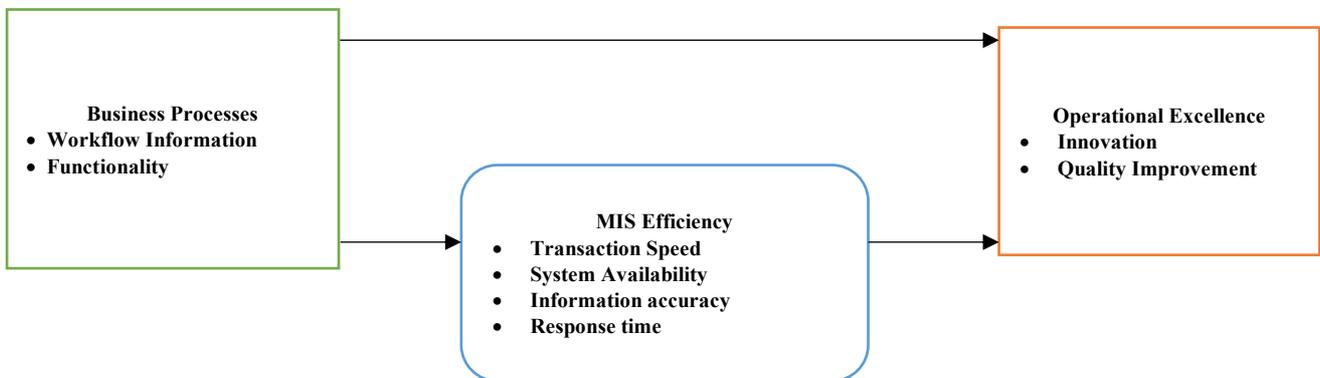


Figure 1: Theoretical Model of the Study

Based on the various variables in this study (BP, MIS efficiency, and OE), Figure 1 presents the proposed model that could be investigated to address the research purpose. The proposed mode could try to find new phenomena in the relationships between BP management (information workflow and jobs functionality) and OE (innovation and quality improvement through MIS efficiency. This model is important due to limitations of conducted studies in this area in banking sector. The previous studies were not explored the relationships between BP management and MIS efficiency, and its impact on OE of the banks.

According to proposed model, there are three main research hypotheses need to be tested, and these hypotheses are as the following:

- H1: There is a significant relationship between BP management and MIS efficiency in the banks.
- H2: There is a significant relationship between of BP functions and the OE in the banks.
- H3: There is a significant relationship between of MIS efficiency and the OE in the banks.
- H4: MIS efficiency mediates the effect of BP on OE of banks.

4. Research Methodology

This study focuses on the variables of MIS efficiency, BP management OE in the actual Jordanian banks and thus, data was collected from the branch level rather than from individual level in that, the unit of analysis is the Jordanian bank, as represented by its managers/assistant managers. The research population comprises of the Housing Bank and Jordanian Islamic Bank’s managers. On the basis of the annual report provided by the Jordanian Housing Bank 2018, the number of bank branches in the country is 130, while that of the Jordanian Islamic bank is 97 branches.

The sampling percentage has to be at least 10% of the population size from 101-1000 units [57]. Each bank in the study sample, as mentioned, is represented by the manager or assistant manager of the bank branch and based on the Jordanian Islamic bank and the Housing Bank, each branch is managed by a manager and two assistant managers and thus, the study

sample should be at least 69 (23 branches*3 managers). However, the questionnaire was collected from 159 managers in Housing bank, and Islamic Jordanian bank.

The sample selection was conducted depending on the sample segment's usefulness and is based on a distinct proportion. The sample in this study was chosen based on quota technique's two strategies; first, the branches of the banks representing the study sample was selected to cover all bank branches in the region (north, middle and south) to examine the impact of MIS efficiency in the entire parts of the region. Second, one of the top employee's proportion criteria is the experience held by the managers and in this regard, the sample was gathered from the proportion holding high experience and knowledge on the study variables. Data was generally gathered from managers and assistant managers of over 5 years of experience in bank management based on their knowledge of MIS implementations in their branches.

This study is quantitative one, with the questionnaire being the major data collection instrument. Therefore, the study questionnaire was arranged to comprise of 4 major parts, with the last 3 parts containing 45 items representing the study variables namely, BP management (independent variable), MIS efficiency (mediating variable) and OE (dependent variable). Every questionnaire part contained items representing each variable's sub-dimension, namely, workflow and job functionality (BP), MIS efficiency and innovation and quality improvement (OE). The questionnaire was validated by three experts in Management information domain.

The items in the questionnaire were gauged through a 5-point Likert scale that focused on the lower scales, generating relative responses means over their high counterparts. The collected data are analyzed using SPSS and AMOS tools based on many analyses such as confirmatory factor analysis, frequency analysis, and descriptive analysis.

5. Discussion of the Results

The questionnaire copies were distributed to 200 managers of two Jordanian banks namely, the Housing Bank and the Jordanian Islamic Bank. From the distributed questionnaires, 32 were not retrieved and 9 questionnaires were dropped owing to incomplete answers, making the valid questionnaires to be included in the data analysis to be 159 in total. The rate of response was therefore 80% (200/159), considered as a good response rate, indicating that the respondents were interactive in their completion of the questionnaire and gave significant concerns about the issues.

5.1 Profile of the Respondents

The demographic data of the respondents were analyzed based on the 159 collected responses and they were analyzed to provide a description of the characteristics of the respondents. Notably, the primarily aim of the research is to examine the mediating effect of MIS efficiency on the BP management-OE relationship among Jordanian banks. Accordingly, there were 7 demographic variables analyzed in light of the aim of the research and they are gender, working position, years of management experience, bank branch location, number of employees in the branch, number of daily conducted tasks in the branch, and the MIS use in the branch. The descriptive information showed that majority of the respondents are male with position of brand manager and have experience of more than 9 years. The branches located in the middle of Jordan with number of employees less than 50 in each branch and daily conducted tasks in the branch is less than 50 with strong utilization of MIS.

5.2 Data Analysis

To reiterate, SPSS V. 25 was used for data screening of 159 collected responses. Accordingly, this study conducted the univariate outlier test based on Z-score in SPSS, with the acceptable values being between -4 and +4 as established by [58]. The results of the Z-score test indicated the 51 items were acceptable from the 159 responses as they fell in the range between -4 and +4. The present study also conducted the multivariate outlier test using Mahalanobis D2 distance, in AMOS. The D2 coefficient value that exceeds 3.5 is deemed to be an outlier (Hair et al., 1998). The results of the test revealed that all 51 items obtained responses that are well below the cut-off (3.5); in particular, the highest D2 coefficient were obtained by the items IWF6 (3.159), WI3 (3.248), and ISQ2 (3.301) and as such, the variables and their items were considered acceptable to be included in the next data analysis phase.

The data screening tests results showed the suitability of data to be exposed to the next data analysis steps, which is data normality. This analysis confirms the validity of data by estimating normal distribution of the data obtained from the questionnaire copies. Normal data distribution shows good relationship between item responses, and this supports the study variables validity. This study used two AMOS tests to assess data normality namely, skewness and kurtosis. In the former, the average data normal distribution should be in the range from -3 to +3, and for the latter, the average data normal distribution should be in the range from -7 and +7. Notably, all the items' responses had normal distribution, indicating support for the study variables and inclusion of all data in the next analysis phase, which involves CFA.

The overall model containing five first order variables was exposed to CFA. The variables include information workflow, working functionality, MIS efficiency, working innovation and improvement of services quality and they were measured by 51 items, which were responded to be 159 respondents. The items and responses were all included in the CFA model's overall assessment. All the 51 items exposed to the overall CFA model analysis was examined for their factor loadings to determine their level of interaction. On the basis of the modified loadings of the CFA analysis, items that obtained values lower than 0.5 (cut-off) were deleted ISQ4). The remaining 44 items interactions were acceptable and included as they

displayed high factor loadings (>0.5) and to conclude, 44 items were included in the next step of the analysis. On the basis of the outcome of the modified factor loadings, the 44 items were run through the goodness of fit test and the test revealed that the final model needed further improvement as the GFI coefficient was 0.839 (below 0.9 cutoff value). For this, Hair et al. (1995) recommended to conduct the re-path correlation test based on the detected errors of the indicators of AFC and SHE. Consequently, the modified model's GFI coefficient reached 0.902 by removing IWF2, WF4 and WI1 (items with high within-construct covariance). As a result, the modified model's goodness of fit depended on the remaining 41 items distributed to measure six variables and based on the final goodness of fit indices values: GFI=0.902, AGFI=0.864, CFI=0.953, TLI=0.962, and IFI=0.981, with RMSEA=0.045 and CMIN/df=2.031.

The reliability values of the 41 items measuring five variables' dimensions. They obtained Cronbach's alpha values ranging from 0.836 to 0.947, which are all above the 0.7 cut off, indicating high reliability of the final model version. The model's AVE is over 0.5 for the variables (0.711-0.883), which reveal good model data validity. In other words, the overall final model version is valid and reliability in representing the research outcomes. The overall modified model was tested for discriminant validity to confirm the correlation among the dimensions.

The good level of inter-correlation among the study variables are presented in the above table based on the 41 items measuring them. Discriminant validity for IW is 0.871, for WF is 0.829, for MEI is 0.805, , WI is 0.892, and for ISQ it is 0.884 – all values confirming the model variable's sufficient interactions. Moreover, the correlations among the variables did not exceed the r^2 of the average variance extracted from individual variables, confirming the overall model's discriminant validity. In sum, the overall model's CFA represented by the values of goodness of fit, reliability and convergent validity and discriminant validity supported the usefulness of the construction of the overall model as evidenced by the results

The overall model fit is focused on, followed by the size, direction and the parameter estimate that were previously hypothesized. Hair et al. (2006) proposed indicating the relationships using one-headed path diagram. The structural model is confirmed through the analysis of the proposed relationships among the identified and assessed variables. AMOS and the maximum likelihood estimate method were utilized in this study for the examination of the proposed hypotheses. In this study, BPM is considered as the independent variable and it covers two dimensions namely, information workflow (IW) and working functionality (WF), MIS is considered as the mediating variable that covers two dimensions namely MIS efficiency (MEI) while OE is considered as the dependent variable with two dimensions namely working innovation (WI) and improvement on services quality (ISQ). Accordingly, this study examined the direct effects of the variables involving, the direct effects of information workflow (IW) and working functionality (WF) on MIS efficiency (MEI) representing hypothesis

H1, and the direct effects of MEI were examined on working innovation (WI) and improvement on services quality (ISQ), representing hypothesis H2. The AMOS structural model graphs and standardized regression weights. The study also examined the direct relationships using a significance level of p -value=0.05, to test the possibility of the relationship effect in one direction. The results of the analysis indicated that R^2 value of BPM is 0.24, which means the error variance of QWL is around 76% of the BPM variance [58]. Similarly, the R^2 value of MIS efficiency is 0.29 and of OE is 0.38. Through the parameter estimates, the hypothesized direct effects can be determined. H1: There is a significant impact between BP management and MIS efficiency in Jordanian banks. In other words, H1 is based on four sub-hypotheses, which are as follows; H1a: There is a significant impact between BP workflow and MIS efficiency in the Jordanian banks. The direct path between IW and MEI in the structural model analysis reveals the following ($\beta = 0.26$, C.R. = 2.215, and $p = 0.005$) and thus supporting hypothesis H1a and confirming the significant relationship between IW and MEI.

H1b: There is a significant impact between BP functionality and MIS efficiency in the Jordanian banks. The direct path between WF and MEI in the structural model analysis reveals the following ($\beta = 0.41$, C.R. = 2.326, and $p = 0.008$) and thus supporting hypothesis H1c, owing to the significant WF-MEI relationship. Despite the rejection of H1b based on the results, overall, H1 is considered to be supported as majority of the sub hypotheses are supported, indicating a positive relationship between BP management and MIS efficiency among banks in Jordan. The details of the results obtained for the sub hypotheses indicate the significant role of information workflow in designing MIS efficiency, including transaction speed and throughput (H1a). MIS efficiency should be efficiently designed according to the information flow among the employees in the workplace. Moreover, working functionality has a key role in designing effective and efficient MIS efficiency in the banks (H1c and H1d), necessitating the provision of efficient and effective functions according to the employees' working responsibilities. The MIS efficiency design in the banks has to be aligned with the information workflow and working functionality management as evidenced by the descriptive analysis results of the study. The results also showed that employees faced challenges in MIS use to manage information workflow and working functionality.

H2: There is a significant impact between MIS efficiency and OE in Jordanian banks. This hypothesis is divided into four sub-hypotheses to explain the relationship in detail. H2a: There is a significant impact between MIS efficiency and OE innovation in Jordanian banks: based on the results of the structural model analysis for the direct path between MEI and WI ($\beta = 0.32$, C.R. = 2.861, and $p = 0.004$), indicating support for H2a. In other words, there is a significant MEI-WI relationship. H2b: There is a significant impact between MIS efficiency and OE quality improvement in Jordanian banks: based on the results of the structural model analysis for the direct path between MEI and ISQ ($\beta = 0.17$, C.R. = 2.321, and $p = 0.007$), indicating support for H2c. In other words, there is a significant MEI-ISQ relationship.

In sum, this study supports hypothesis H2 and its sub hypotheses, indicating a positive relationship between MIS efficiency and OE of the banks in Jordan. In this regard, the MIS efficiency is significant in improving working innovation of banks along with their service quality provision. They enable bank employees to be innovative in achieving their tasks, which in turn, enhances the quality of the services provided.

Also, The SEM approach is a suitable one to employ compared to the regression techniques to test the mediating effect as the former enables modeling of measurement and structural relationships and produces overall fit indices. Specifically, for the mediating effect (H3) examination, this study adopted the bootstrapping method as suggested by [58]. The findings showed the following details.

H3: There is a significant mediating effect of MIS efficiency on the relationship between BP management and OE in Jordanian banks. Partial mediation of MIS efficiency on the relationship between BPM and OE, which means hypothesis H3 is partially supported. In particular, the indirect paths through MEI the coefficient of standardized effect and p-value were highly significant. This shows that MEI plays a mediating role in the BPM and OE relationship among Jordanian banks. There is a significant relationship between information workflow (IW) and working innovation (WI), through the mediating effect of MEI, with the standardized total effect and p-value being 0.173 and 0.028 respectively. This supports the significant effect of MEI ($p < 0.05$) on the relationship between (IW) and (WI). Along a similar line of finding, MEI was found to significantly affect the IW-ISQ relationship, with the indirect path between the variables obtained as 0.167 (standardized total effect) and 0.019 (P-value). Moreover, MEI was found to significantly affect the WF and WI relationship, with the indirect path significance being 0.188 and 0.004 for the standardized total effect and p-value respectively. Finally, MEI was found to significantly affect the WF-ISQ relationship with the standardized total effect and p-value being 0.031 and 0.008 respectively.

In sum, hypothesis H3 was partially supported in light of MIS mediating significant mediating effects. The entire indirect supported paths reveal the efficiency of MIS role in the relationship between BPM and OE in Jordanian banks. Stated clearly, working innovation and services quality can be enhanced on the basis of MIS efficiency. This supports the importance of MIS use designed tailor-made for the working environment as opposed to a developed MIS adopted from other banks or business entities.

6. Conclusion and Future Works

Prior related theories and research revealed that BPM is controlled by the workflow of information and the working functionality. As a consequence, several studies contended that the BPM major dimensions are information workflow and working functionality in relation to the MIS services, their efficiency form the matrix of the related functions, with the functions being the MIS facilities characteristics. Efficient MIS could lead to enhanced BPM. Prior studies contended that the MIS efficiency primarily rest on its efficiency. More specifically, the MIS efficiency matrix encapsulates the throughput, transactions speed, information accuracy, system availability, and response rate. With regards to operational excellence of the banks, working innovation and improvement of services quality were the two significant dimensions mentioned in literature.

According to the conducted analysis based on 159 responses from managers in Jordanian banks, the argument that managing information workflow and working functionality of Jordanian banks assist in structuring the efficient of MIS function for BPM. In this regard, inappropriate MIS function could lead to serious issues in banking BPM. The structure of BP based on MIS efficiency assist in enhancing banks OE and in increasing the opportunities to achieve tasks innovatively. Also, it could enhance the banks' provision of services. In the future, the structural equation model would be conducted to show the relationship between the BP and OE through the mediating effect of MIS efficiency.

References

- [1] A. A. A. H. Al-Dalaien, S. M. Drus, and H. Kasim, "A conceptual model of motivational factors of knowledge transfer for hospitals," *Int. J. Eng. Adv. Technol.*, vol. 9, no. 1, pp. 2313–2319, 2019.
- [2] A. A. A. H. Al-Dalaien, S. M. Drus, H. Kasim, and A. T. Al-Oqaily, "Investigate the extrinsic and intrinsic motivational factors of knowledge transfer in the hospitals," *J. Comput. Sci.*, vol. 16, no. 1, pp. 92–104, 2020.
- [3] S. Alaaraj, Z. A. Mohamed, and U. S. Ahmad Bustamam, "External Growth Strategies and Organizational Performance in Emerging Markets: The Mediating Role of Inter-Organizational Trust," *Rev. Int. Bus. Strateg.*, vol. 28, no. 2, pp. 206–222, 2018.
- [4] P. Lankeshwara, "A study on the impact of workplace environment on employee's performance: with reference to the Brandix Intimate Apparel - Awissawella," *Int. J. Multidiscip. Stud.*, vol. 3, no. 1, p. 47, 2016.
- [5] O. H. Al-Masri, S. M. Drus, and A.-H. Aldalaien, "A systematic inspection into the criteria of lecturer performance in educational domain," 2019.
- [6] M. Z. Alksasbeh, A. A.-H. Al-Dala, and B. A. Y. Alqaraleh, "Factors that Influence the Success of Knowledge Management Implementation in Jordanian Higher Education Institutions," *Res. J. Appl. Sci. Eng. Technol.*, vol. 15, no. 7, pp. 249–260, 2018.
- [7] A. A.-H. Al-Dala'Ien, M. A. Mahmoud, and M. S. Ahmad, "A model for measuring articles knowledgeability levels," *J.*

Theor. Appl. Inf. Technol., vol. 88, no. 1, p. 1, 2016.

- [8] N. Ahmad, M. Yazis, and M. S. Oudat, "Analysing Long-Run and Short-Run Relationships between Macro-economic Variables and Murabaha to the Purchase-Order: Evidence from Jordanian Islamic Bank," *Int. J. Econ. Financ.*, vol. 7, no. 2, pp. 168–177, 2015.
- [9] M. S. Oudat, N. Ahmad, and M. Yazis, "The impact of macroeconomic variables and global events on banking system: Evidence from Jordanian banking system," *J. Adm. Bus. Stud.*, vol. 2, no. 1, pp. 29–34, 2016.
- [10] M. H. Hussein, S. H. Ow, I. Ibrahim, and M. A. Mahmoud, "Measuring instructors continued intention to reuse Google Classroom in Iraq: a mixed-method study during COVID-19," *Interact. Technol. Smart Educ.*, 2020.
- [11] W. A. Al-Suraihi, A.-H. A. Al-Suraihi, I. Ibrahim, A. Al-Tahitah, and M. Abdulrab, "The Effect of Customer Relationship Management on Consumer Behavior: A Case of Retail Industry in Malaysia," *Int. J. Manag. Hum. Sci.*, vol. 4, no. 3, pp. 32–40, 2020.
- [12] I. Ibrahim, K. Ali, and A. R. Zumrah, "An Empirical Study: The Mediating Role of Job Satisfaction on the Relationship between Belongingness and Employee Retention in Malaysian Manufacturing Industry."
- [13] I. B. Melhem, "Impact of the Human Resources on the Risk Management and the Company Performance," *Int. J. Econ. Manag. Sci.*, vol. 5, no. 2, pp. 1–5, 2016.
- [14] K. A. Is'haq Ibrahim, "The Impact of Challenging Work on Employee's Retention in the Manufacturing Industry in Klang Valley," *Int. J. Psychol. Cogn. Sci.*, vol. 5, no. 1, pp. 1–8, 2019.
- [15] I. I. A. B. Melhem, "The Mediating Effect of Job Satisfaction on the Relationship Between Belongingness and Challenging Work Towards Employee Retention." Universiti Sains Islam Malaysia, 2019.
- [16] R. Van Wijk *et al.*, "Social Exchange Theory," *Int. J. Hum. Resour. Manag.*, 2014.
- [17] M. I. Mugableh and M. S. Oudat, "Economic Growth and Financial Development Nexus in Malaysia: Dynamic Simultaneous Equations Models."
- [18] M. Oudat, H. Hasan, and A. Alsmadi, "Macroeconomic variables and portfolio investment in Bahrain using an ARDL bound testing approach," *Accounting*, vol. 6, no. 4, pp. 465–472, 2020.
- [19] A. Alhasan, L. Audah, I. Ibrahim, A. Al-Sharaa, A. S. Al-Ogaili, and J. M. Mohammed, "A case-study to examine doctors' intentions to use IoT healthcare devices in Iraq during COVID-19 pandemic," *Int. J. Pervasive Comput. Commun.*, 2020.
- [20] S. Alaarj, Z. A. Mohamed, and U. S. A. Bustamam, "The Effect of Knowledge Management Capabilities on Performance of Companies : A Study of Service Sector," *Int. J. Econ. Res.*, vol. 14, no. 15, pp. 457–470, 2017.
- [21] S. Alaarj, Z. A. Mohamed, and U. S. A. Bustamam, "Do Knowledge Management Capabilities Reduce the Negative effect of Environment Uncertainties on Organizational Performance? A Study of Public Listed Companies in Malaysia," *Int. J. Econ. Res.*, vol. 14, no. 15, pp. 443–456, 2017.
- [22] M. A. M. M. S. Ahmad, "An Investigation on Measuring Accuracy of Explicit Knowledge Sources in Universities."
- [23] K. G. Al-Moghrabi, A. M. Al-Ghonmein, M. Z. Alksasbeh, and A. A. Al-Dalaien, "Towards A Cloud Computing Success Model For Hospital Information System In Jordan," *Int. J.*, vol. 10, no. 2, 2021.
- [24] K. C. Laudon and J. P. Laudon, *Management Information Systems: Managing the Digital Firm*, vol. 14. 2016.
- [25] C. H. Jin, "The effects of mental simulations, innovativeness on intention to adopt brand application," *Comput. Human Behav.*, vol. 54, pp. 682–690, 2016.
- [26] S. Alaarj, Z. A. Mohamed, and U. S. A. Bustamam, "Knowledge Management Capabilities, Environment Uncertainties; Their Influence on Organizational Performance,," in *The 2nd International Conference on Islamic Perspective of Accounting, Finance, Economics and Management (IPAFEM)*, 2016.
- [27] S. Alaarj, Z. Abidin-Mohamed, and U. S. B. A. Bustamam, "Mediating Role of Trust on the Effects of Knowledge Management Capabilities on Organizational Performance," *Procedia - Soc. Behav. Sci.*, vol. 235, pp. 729–738, Nov. 2016.
- [28] S. Alaarj, Z. A. Mohamed, and U. S. B. A. Bustamam, "Knowledge Management Capabilities, Environment Uncertainties; Their Influence on Organizational Performance," in *The 2nd International Conference on Islamic Perspective of Accounting, Finance, Economics and Management (IPAFEM)*, 2016.
- [29] S. Alaarj, A. M. Zainal, and U. Bustamam, "The Effect of Knowledge Management Capabilities on the Performance of Malaysian Large-Scale Organizations: An Empirical Study," *Adv. Glob. Bus. Res.*, vol. 12, no. 1, pp. 1024–1038, 2015.
- [30] G. M. A. Altemh, "Evaluating the Requirements for the Success of E-government Implementation from the Viewpoint of Academic Members in Jordanian Universities," *Int. J. Contemp. Manag. Inf. Technol.*, vol. 1, no. 2, pp. 44–49, 2021.
- [31] O. B. Al-gharaibah, "Predictors of E-banking Service Adoption in Malaysia Using an Extended Technology Acceptance Model," *Int. J. Contemp. Manag. Inf. Technol.*, vol. 1, no. 1, pp. 23–29, 2020.
- [32] K. C. Laudon, J. P. Laudon, and J. P. Laudon, K. C., & Laudon, *Management Information Systems : managing the digital firm.*, 8th ed., vol. 14. Prentice Hall, 2004.
- [33] K. J. Trainor, J. (Mick) Andzulis, A. Rapp, and R. Agnihotri, "Social media technology usage and customer relationship performance: {A} capabilities-based examination of social {CRM}," *J. Bus. Res.*, vol. 67, no. 6, pp. 1201–1208, 2014.

- [34] M. Kayali and S. Alaaraj, "Adoption of Cloud Based E-learning in Developing Countries : A Combination A of DOI , TAM and UTAUT," *Int. J. Contemp. Manag. Inf. Technol.*, vol. 1, no. 1, pp. 1–7, 2020.
- [35] S. Alaaraj, Z. A. Mohamed, and U. S. A. Bustamam, "Growth Strategies and Organizational Performance of Service Companies in Malaysia : The Mediating Role of Knowledge Sharing," *Adv. Glob. Bus. Res.*, vol. 15, no. 1, 2018.
- [36] K. M. Hyde, "Uncertainty Analysis Methods For Multi-Criteria Decision Analysis," no. May, pp. 1–395, 2006.
- [37] M. Sarrab, M. Elbasir, and S. Alnaeli, "Towards a quality model of technical aspects for mobile learning services: An empirical investigation," *Comput. Human Behav.*, vol. 55, pp. 100–112, 2016.
- [38] Ş. Aslan, A. Diken, and A. A. Şendogdu, "Investigation of the effects of strategic leadership on strategic change and innovativeness of SMEs in a perceived environmental uncertainty," *Procedia - Soc. Behav. Sci.*, vol. 24, pp. 627–642, 2011.
- [39] R. Grant, "Toward a knoweldge-based theory of the firm," *Strateg. Manag. J.*, vol. 17, no. S2, pp. 109–122, 1996.
- [40] D. Neef, "Making the case for knowledge management: the bigger picture," *Manag. Decis.*, vol. 37, no. 1, pp. 72–78, 1999.
- [41] S. M. Sarif, A. Sarwar, and Y. Ismail, "Practice of Social Entrepreneurship among the Muslim Entrepreneurs in Malaysia," *Middle-East J. Sci. Res.*, vol. 14, no. 11, pp. 1463–1470, 2013.
- [42] S. Alaaraj, "Knowledge Management Capability , Trust , and Performance of Manufacturing Companies in Emerging Economies," *Int. J. Manag. Appl. Sci.*, vol. 4, no. 8, pp. 45–53, 2018.
- [43] S. Alaaraj, "Knowledge Management Capabilities, Trust, and Performance of Manufacturing Companies in Emerging Economies," in *Proceedings of 177 th The IIER International Conference*, 2018, pp. 1–9.
- [44] J. Mansvelt, G. Suddaby, D. O'Hara, and A. Gilbert, "Professional development: assuring quality in e-learning policy and practice," *Qual. Assur. Educ.*, vol. 17, no. 3, pp. 233–249, 2009.
- [45] C. M. F. Tang and D. Lam, "The role of extraversion and agreeableness traits on Gen Y's attitudes and willingness to pay for green hotels," *Int. J. Contemp. Hosp. Manag.*, 2017.
- [46] A. K. Tawalbeh, "The Role of Social Media in Knowledge Sharing Among Faculty Members in Jordanian Public Universities," *Int. J. Contemp. Manag. Inf. Technol.*, vol. 1, no. 2, pp. 35–43, 2021.
- [47] R. S. Marshall, T. V. Nguyen, and S. E. Bryant, "A dynamic model of trust development and knowledge sharing in strategic alliances.pdf," *Journal of General Management*, vol. 31, pp. 41–57, 2005.
- [48] M. A. Wahsh and J. S. Dhillon, "An investigation of factors affecting the adoption of cloud computing for E-government implementation," *2015 IEEE Student Conf. Res. Dev. SCORED 2015*, pp. 323–328, 2015.
- [49] M. A. A.-H. Al-Dalaien, M. M. Alzubi, and S. N. Y. Alheety, "The mediating role of Management Information System between Business Processes Management and Operational Excellence in Banks," *Int. J. All Res. Writings*, vol. 2, no. 12, pp. 49–58, 2020.
- [50] A. T. Al-Oqaily, Z. Bin Hassan, A. Dala'Ien, and A. M. Rashid, "Develop practical methods of knowledge measurement in universities," 2015.
- [51] H. Y. Ha, S. Janda, and S. K. Muthaly, "A new understanding of satisfaction model in e-re-purchase situation," *Eur. J. Mark.*, vol. 44, no. 7, pp. 997–1016, 2010.
- [52] M. A. A.-H. Al-Dalaien, S. N. Y. Alheety, and M. M. Alzubi, "Role of MIS Functions in Enhance the Business Processes and Operational Excellence of the Banks."
- [53] A. Marei, L. Daoud, M. Ibrahim, and S. Al-Jabaly, "Moderating role of top management support in electronic procurement usage of Jordanian firms," *Manag. Sci. Lett.*, vol. 11, no. 4, pp. 1121–1132, 2021.
- [54] M. A. A. S. Al-dalaien *et al.*, "The Effect of Business Processes Management on Operational Excellence In Banks : A Conceptual Framework," *Int. J. Contemp. Manag. Inf. Technol.*, vol. 1, no. 5, pp. 16–21, 2021.
- [55] A. M. K. ALKHAALAH and A. MAREI, "The Impact of Irregular Auditing on Quality of Financial Reports: A Case Study in Jordan," *J. Asian Financ. Econ. Bus.*, vol. 8, no. 6, pp. 59–69, 2021.
- [56] L. Daoud, A. Marei, S. Al-Jabaly, and A. Aldaas, "Moderating the role of top management commitment in usage of computer-assisted auditing techniques," *Accounting*, vol. 7, no. 2, pp. 457–468, 2021.
- [57] U. Sekaran and R. Bougie, *Research methods for business: A skill building approach*. John Wiley & Sons, 2016.
- [58] J. F. Hair, R. E. Anderson, B. J. Babin, and W. C. Black, *Multivariate Data Analysis: A global perspective*, 7th ed. NJ: Pearson, 2010.