# Mediating Effect of Information System among the relationship of Technology Innovation, Management Innovation, and Operational Performance of Textile industry in Iraq

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*Competitiveness and long-term survival are among organizations' objectives for their continued existence. Nonetheless, information system (IS) encourages organizations to achieve greater performance. IS cannot live alone; it requires adequate resources and capacities. Existing research has primarily focused on those aspects that affect IS, but the innovation perspective has received less consideration. Consequently, the purpose of this study is to examine the mediating effect of IS on the relationships between managerial innovation (MEI), technological innovation (TEI), and operational performance (OP) in the Iraqi textile industry. Quantitative research methodology and cross-sectional research design were employed. The data was acquired from 400*

*managers using a technique of easy sampling. The major findings revealed that TEI and MEI directly correspond to both OP and IS. Similarly, the IS had a tremendous impact on OP. The indirect impact also demonstrated that IS strongly mediates between TEI, MEI, and OP. These findings contributed to the existing body of literature and provided policymakers and owners with practical implications regarding the importance of IS in improving OP.*

**Keywords:** management innovation, technology innovation, operational performance, information system, Iraq.

## Background of Study

In the contemporary context, the major objective of an organization is to achieve a competitive edge in performance. A range of methods and techniques are employed by businesses to achieve high performance (Khan et al., 2019). Recent studies have argued that operational performance is crucial to attaining a competitive edge (Almeida & Melo, 2017). In other words, a company's performance can be significantly enhanced by developing and marketing an information system (Marsat et al., 2022). Consequently, an information system meets the current generation's needs without jeopardizing future generations' ability to do the same (Brundtland, 1987). An information system is a multidimensional phenomenon. Frequently, it is coupled with operational and economic performance. There is sometimes described instead of as a gauge of a company's ability to achieve its aim, sustain its shareholders over time, and have a measurable influence. A well-implemented information system could boost the company's ability to develop long-term goals and open the door to new funding opportunities (Gundry et al., 2014). A corporation depending on information systems is more concerned with its long-term viability. Firms with well-implemented information systems can achieve their long-term goals and perform better in situations with limited resources (Gundry et al., 2014; H. Li et al., 2012).

Information system research focuses on the influence on operational performance (Kaydos, 2020; Swanson, 1994). Regarding its potential significance in operational success, business and non-business organizations have prioritized constructing an information system (W. Lee, 2017). However, not all organizations can establish an information system (Magon et al., 2018). Some organizations have the resources and skills necessary to establish an information system (W. Lee, 2017). Numerous research has investigated the factors that impact information systems (Jansson et al., 2017). New predictors like management innovation (MEI) and technological innovation (TEI) have gotten less attention compared to established drivers (Okhunov & Minamatov, 2021). MEI and TEI are considered essential elements of an information system (Kassen, 2022). These findings demonstrate that innovation variables are significant determinants for enhancing the information system's operational performance (Le Anh et al., 2021).

In addition to the significance of earlier studies on the relationship between TEI, MEI, information system, and operational performance, the findings between the information system and performance have been given (Geng et al., 2017). Due to globalization, firms have moved their emphasis to technology and imaginative initiatives (Anwar et al., 2019). Recent studies indicate that innovation is the best

long-term strategy for companies to survive in unpredictable markets (Ortiz-Villajos & Sotoca, 2018). Numerous types of innovation, such as marketing innovation, eco-innovation, product innovation, social innovation, and organizational innovation (Nemlioglu & Mallick, 2017), may impact a business's information system and operational performance (Chatterjee et al., 2021). The MEI Expósito and Sanchis-Llopis (2019) and TEI Wirtz et al. (2016) are the most important innovations for the continuation of businesses. MEI and TEI are largely overlooked within the scope of an organization's information system, despite the importance of innovation. Existing research has also examined the direct effect of MEI and TEI on operational performance (González-Blanco et al., 2019). However, indirect influence is still unanswered. This study aims to determine if MEI or TEI influence operational performance directly or whether the information system mediates the relationship.

Since the 1990s, however, due to a range of environmental challenges, tensions have inevitably emerged within organizations, prompting them to establish internal procedures; innovative, technological, and non-technology-driven reasons for their business. Particularly, the business should implement adequate governance, management, and processes to respond correctly to changes in the surrounding environment (Almeida & Melo, 2017). We believe that neither MEI nor TEI can improve information systems and performance alone, but the two technologies are complementary. Consequently, these innovation indicators become complementary to organizations. Specifically, Hamel (2006) asserts that MEI is one of the most significant factors influencing sustained operational effectiveness. Similarly, it has been stated that TEI is necessary for performance in a globalized society (Yang et al., 2018). Surprisingly, past studies continue to assert a dearth of research on MEI and TEI's impact on information systems and operational performance (Hervas-Oliver et al., 2018; Walker et al., 2011).

Based on past gaps, the current study contributed numerous ways to the continuing research on MEI, TEI, information systems, and operational performance. Previous studies in Iraq (Kareem, Aziz, et al., 2021; Kareem, Dauwed, et al., 2021) paid little attention to the textile industry, despite its significant contribution to the social and economic growth of the country (Kareem, Aziz, et al., 2021). Previous research has revealed that the most significant factors that can benefit the expanding textile industry in Iraq are a lack of resources and a deficient information support system, both of which hamper the sector's operational performance (Bajaee & Mohamed, 2021). Consequently, we view MEI and TEI as new activities that can contribute to businesses' information systems and performance. In addition, prior researchers paid insufficient attention to the relationship between MEI, TEI, operational performance, and information systems' impact. Because prior studies focused primarily on the direct effects of MEI and TEI on operational performance, indirect effects through the information system received less attention. Therefore, the present study chose the information system as the mediating variable. The two theories of value creation and value destruction were applied to the interaction between information systems and operational performance (Yu et al., 2021).

On the other hand, the resources-based perspective theory was employed to demonstrate that resources (innovations) improve the performance of companies (Olavarrieta & Friedmann, 2008). The purpose of this study is to examine the impact

of the information system as a mediator between MEI, TEI, and the operational performance of the textile sector in Iraq. Five chapters make up the study: introduction, literature review, methodology, analysis, and discussion.

## Literature Review

### Management Innovation, Information System, and Operational performance

Management innovation (MEI) is challenging to accurately describe (Zhu et al., 2012). MI is defined as "new management and administrative actions and procedures," in contrast to technological innovation (Zhu et al., 2012). Some scholars define MI as a reference to cutting-edge methods and frameworks, demonstrating that no one definition of MI exists (Whittington et al., 2002). However, some academics think that MI is something fresh that an organization gets from outside sources, perhaps its rivals (Zbaracki, 1998). MI refers to current management approaches to enhance corporate outcomes. Is the "development and execution of state-of-the-art management practice, method, framework, or procedure" (Birkinshaw et al., 2008) to accomplish organization objectives? (p. 829). Typically, it addresses alterations in managerial roles and techniques (Hamel, 2006). Thus, MI is associated with alterations in management practices, including strategy creation, decision making, work allocation, and employee motivation (Hamel, 2006). These changes are considered inherent to businesses and take the shape of novel management techniques, methods, and the format and application of MEI. MEI is particularly effective in highly competitive and turbulent markets like China since it improves a company's internal operations, enhancing its operational performance (Han & Nielsen, 2018). Schumpeter outlines several categories: product, marketing, operational, and organizational innovations. Some innovations (typical of executive practices) benefit a company's bottom line more than others (Nemlioglu & Mallick, 2017), mostly because they include research and development and new approaches to old challenges. Additionally, MEI helps implement new ideas and technologies into business operations (Hollen et al., 2013).

MEI has been regarded as a crucial instrument for organization expansion and productivity. This helps the Structural Equation Modeling (SEM) business efficiently adjust to external problems. In dynamic circumstances, MEI can increase firm performance to such a significant degree (Seo & Chae, 2016). MEI helps enterprises in various ways, but it also plays a crucial role in improving operational performance. Moreover, Hinterhuber and Liozu (2017) said that a modern management system employs a variety of rules and processes to make more efficient use of resources, hence assisting businesses in achieving sustainable worldwide competitiveness. Leaders of organizations appreciate the significance of MEI and frequently support it.

Consequently, they give adequate attention to implementing MEI throughout all divisions (Mol & Birkinshaw, 2009). It is impossible to overestimate the senior management team's inventive role in boosting products and procedures and increasing earnings (Haneda & Ito, 2018). MEI contributes to achieving high performance by ingeniously combining multiple operational strategies. Additionally, MEI appears to be a key factor in the success of companies (D. Li et al., 2018). According to proponents of MEI, the method significantly increases profitability (Zhang et al., 2019).

On the other side, it was demonstrated that when management innovation increases in a company, so do the information system, enhancing the organization's operational performance (Khosravi et al., 2019; Stata, 1989). This argument was bolstered by the fact that technology innovation is an essential signal for improving the information system (Allen, 2000) and performance (Nawab et al., 2015). In the study (López-Nicolás & Meroño-Cerdán, 2011), a further positive and significant association was found between innovation and information system, and it was argued that information system becomes an important indicator for operation when an organization has a proper innovation process in technology. In contrast, a significant negative correlation was discovered by Tarafdar and Gordon (2007). These previously stated data indicate that technological innovation is a significant indicator of operational performance and information systems and indirectly improves operations. The information system is therefore offered as a variable that mediates the relationship between technological innovation and operational performance. The following hypotheses are presented:

**H1:** Management innovation has a positive and significant impact on the operational performance of the textile industry in Iraq.

**H2:** Management innovation has a positive and significant impact on the information system of the textile industry in Iraq.

**H3:** Information system significantly mediates the relationship between management innovation and operational performance of the textile industry in Iraq.

**Technological Innovation, Information System, and Operational performance**

Samson and Terziovski (1999) define it as the execution of a concept for a particular product or service and the incorporation of new components into a company's operating system and service operation. According to reports, firms used material technologies to address technological issues (Saunila, 2014). A corporation can define general tasks and activities to accelerate the development of an application. In addition, they recognized the technological trajectory as a potential instrument of technology contributing to the formation of the technological paradigm. We value the situation in which MEI increases performance by supporting long-term viability. Technology innovation (TEI) efforts are a top priority for many organizations' upper management in today's competitive business environment. Enterprises that incorporate cutting-edge technology in their goods and services would perform better in the turbulent markets of the present day (Coccia, 2017). According to the research-based value (RBV) school of thought in strategic management (Anwar, 2018; Olavarrieta & Friedmann, 2008), a corporation can maintain a competitive edge in an uncertain market if it has access to services and talents that are difficult to replicate.

Developing new products is essential for operational success and profitability (Camisón & Villar-López, 2014), and TEI may help them do so. In a turbulent economy, these enterprises emerge as market leaders whose superior informational and technical resources serve them effectively. TEI could help an organization accomplish its profit goals, especially in emerging areas (Y. Li et al., 2006). Even in the face of significant levels of unpredictability, TEI enables organizations to rapidly ascend to the top of their industry and acquire a valuable market share. In contrast, research indicates that low TEI levels may impede a company's capacity to expand its

client base and increase income (Ordanini & Rubera, 2010). Not only is TEI applicable in a specific organization (Miller et al., 2007), but its implementation has been shown to improve performance in a variety of others, including the service and manufacturing sectors (Sirilli & Evangelista, 1998). Compared to other types of innovation, TEI has a far bigger influence on operational performance (Ryu, 2016). The importance of TEI in determining operational performance is widely accepted (Hervas-Oliver et al., 2018).

On the other hand, it was demonstrated that when the level of technology within an organization rises, so does the level of information system, enhancing the firm's operational performance (Kim et al., 2006). This argument was bolstered by the fact that technology innovation is an essential signal for improving the information system (Allen, 2000) and performance (Hutahayan, 2020). The study Avgerou et al. (2004) revealed a further positive and statistically significant correlation. It concluded that when an organization has a proper technological innovation process, the information system becomes a crucial indication for functioning. In contrast, a significant negative correlation was discovered by Fichman (2004). These previously stated data indicate that technological innovation is a significant indicator of operational performance and information systems and indirectly improves operations. The information system is therefore offered as a variable that mediates the relationship between technological innovation and operational performance. The following hypotheses are presented:

**H4:** Technology innovation has a positive and significant impact on the operational performance of the textile industry in Iraq.

**H5:** Technology innovation has a positive and significant impact on the information system of the textile industry in Iraq.

**H6:** Information system significantly mediates the relationship between technological innovation and operational performance of the textile industry in Iraq.

**Management Innovation and Information system**

Strategic planning and long-term goals are the responsibility of senior management. In this age of globalization, businesses implement sustainability policies through various means. Market intelligence (MI) has emerged as a key approach, especially in developing economies (Kraśnicka et al., 2018). Managers are beginning to focus on the strategies (such as innovation, corporate knowledge, and training) that can build sustainable practices (Pereira et al., 2021) due to the increasing importance of sustainability to businesses.

Sustainability appears crucial for the health of the environment, and it significantly impacts company success. Therefore, CEOs use fresh pursuits and eco-friendly methods to meet their demands more effectively (Horng et al., 2017). MI is particularly beneficial for gaining competitive advantage and long-term viability among a company's many objectives (Stata, 1989). Modern businesses, for example, seek financial success and positive social and environmental consequences. These outcomes are vital to a company's long-term success and require strong support from MI (Zhu et al., 2012). Senior management requires continuous innovation diffusions to link internal plans and procedures to environmental and demand changes (Horng et al., 2017). MI is more important than ever in securing a company's long-term viability (Erzurumlu & Erzurumlu, 2013). Previous research has demonstrated that the

information system is essential for improving operational performance. Consequently, the following theory is proposed:

**H7:** information system has a positive and significant impact on operational performance.

## Research Methodology

The goal of this study was to examine the mediating role of information systems (IS) in the relationship between technology innovation (TEI), management innovation (MEI), and operational performance (OP) (OP). The research methodology was quantitative and included a cross-sectional design. The reliability and validity of quantitative research methods are superior to qualitative research methods. For this reason, data was collected from Iraq's textile industry managers. Individual and population units of analysis were Iraqi textile industry managers. The managers were chosen according to their superior knowledge of the organization. The data was acquired using a method of easy sampling. The questionnaire was delivered to 600 managers employed in the Iraqi textile industry. 400 questionnaires were returned, representing a response rate of 60%. Using a self-administered questionnaire adapted from prior studies, the data was gathered. The TEI was measured with nine items, the MEI with five, and the OP with five. These items were taken from the research of (Zhang et al., 2019).

In contrast, IS was assessed using five items borrowed from the study (J. Hair et al., 2017). These items were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Technology innovation and management innovation are independent factors, while information system is the mediating variable and operational performance is the dependent variable, as shown in Figure 1.

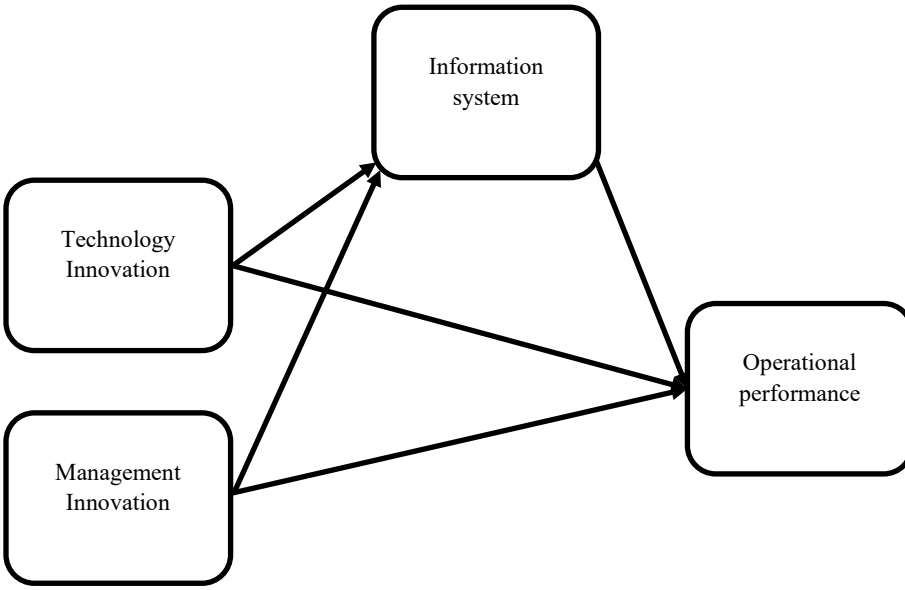


**Figure.1:** *Conceptual Framework*

**Data analysis and interpretation**

The data were analyzed using the following software: SPSS and Smart PLS. The SPSS was used for descriptive analysis, and Smart PLS was used for inferential statistics.

**Descriptive Statistics**

Additionally, descriptive statistics are computed with SPSS-22. Through measures of central tendency and dispersion, these studies provide information regarding the trends of each item in the model. The most prevalent approach for calculating the central tendency is the mean score of the responses. According to Table 1, the mean values of the independent variables utilized in this study, namely management innovation ((MEI), technological innovation (TEI), and an information system (IS), are 3.3703, 3.3932, and 3.2967, respectively. The value of the operational performance (OP) dependent variable is 3.5923. Likewise, in Table 4, The standard deviations for the variables management innovation (MEI), technological innovation (TEI), and an information system (IS) are 0.61 537, 0.63 437, and 0.72 527, respectively. In addition, the standard deviation of the operational performance (OP) dependent variable is 0.60194. In addition, the confirmation that there are no issues with data distribution. The results of the descriptive analysis are presented in Table 1 below.

**Table. 1:** *Descriptive Statistics*

| Descriptive Statistics | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **N** | **Minimum** | **Maximum** | **Mean** | **Std. Deviation** | **Skewness** | **Kurtosis** |
| OP | 400 | 1.00 | 5.00 | 3.5923 | .60194 | -.827 | 2.201 |
| MEI | 400 | 1.00 | 5.00 | 3.3703 | .61537 | -.309 | 1.394 |
| TEI | 400 | 1.00 | 5.00 | 3.3955 | .63437 | -.540 | 1.865 |
| IS | 400 | 1.00 | 5.00 | 3.2967 | .72527 | -.081 | .421 |

**Note** technology innovation (TEI), Management innovation (MEI), Information system (IS), and Operational performance (OP).

**Contract Reliability and Validity Model**

In this phase of the study, data dependability is initiated and represented in Table 2. The measuring model was tested using two validity criteria derived from two models: convergent and discriminant validity. Convergent validity refers to the degree to which all measures of the same construct agree (Hair Jr et al., 2018). Composite reliability (CR), factor loading, and extracted average variance can be used to establish convergent validity (AVE). The intelligent PLS was applied to load each questionnaire item. A minimum load value of 0.50 or greater is required for the factor to accept the item (Hair Jr et al., 2018). In addition, the CR that defines the divide must be at least 0.70 (Hair Jr et al., 2018). The AVE must be equal to or greater than 0.50 (J. F. Hair et al., 2016). The above-described results are projected in the following Table 2 below.

**Table.2:** *Convergent validity*

| Constructs | Items | Factor Loading | Cronbach's Alpha | CR | AVE |
|---|---|---|---|---|---|
| **Operational performance** | OP1 | 0.639 | 0.83 | 0.881 | 0.598 |
| | OP2 | 0.812 | | | |
| | OP3 | 0.81 | | | |
| | OP4 | 0.797 | | | |
| | OP5 | 0.795 | | | |
| **Management Innovation** | MEI1 | 0.708 | 0.847 | 0.873 | 0.634 |
| | MEI2 | 0.805 | | | |
| | MEI3 | 0.819 | | | |
| | MEI4 | 0.846 | | | |
| | MEI5 | 0.894 | | | |
| **Technology innovation** | TEI1 | 0.718 | 0.838 | 0.884 | 0.604 |
| | TEI2 | 0.785 | | | |
| | TEI3 | 0.782 | | | |
| | TEI4 | 0.779 | | | |
| | TEI5 | 0.82 | | | |
| | TEI6 | 0.818 | | | |
| | TEI7 | 0.847 | | | |
| | TEI8 | 0.717 | | | |
| **Information system** | IS1 | 0.726 | 0.781 | 0.861 | 0.605 |
| | IS2 | 0.831 | | | |
| | IS3 | 0.792 | | | |
| | IS4 | 0.759 | | | |
| | IS5 | 0.890 | | | |

**Note:** technology innovation (TEI), Management innovation (MEI), Information system (IS), and Operational performance (OP).

**Discriminant Validity**

Discriminant validity is also a key and recommended validity test employed in this study. It has two types of criteria, first Fornell & Larcker and second Hetero Trait Mono Trait (Fornell & Larcker, 1981). "Two additional techniques in which the construct can be discriminately true were also suggested by J. F. Hair et al. (2016). Heterotrait-Monotrait Correlation Ratio (HTMT) is the third method, while the first two are "former and larker systems" and "cross-loading" (Henseler et al., 2015). According to the first way, indicators create greater variation than any other structure. Due to this, the structure is deemed to have discriminatory validity, albeit with a larger AVE square root value than the structure with the highest correlation (Chin, 1998). Cross-loading permits each indication to be loaded more severely than the transverse loads of the other components (Henseler et al., 2015). "As a result, discriminant validity was improved for each structure in the sample when the AVE of each structure exceeded the maximum square correlation with any other structure, and the loading of each indicator in each structure exceeded the cross loading in any other structure. The minimal AVE value is at least 0.50." If the HTMT is less than 0.90, a discriminant between the two constructs must be determined (Hair Jr et al., 2018)."

**Table.3:** *Fornell and Larker*

| | OP | MEI | TEI | IS |
|---|---|---|---|---|
| **OP** | 0.777 | | | |
| **MEI** | 0.566 | 0.753 | | |
| **TEI** | 0.432 | 0.521 | 0.778 | |
| **IS** | 0.52 | 0.568 | 0.574 | 0.774 |

**Note:** technology innovation (TEI), Management innovation (MEI), Information system (IS), and Operational performance (OP).

**Table.4:** *HTMT*

| | OP | MEI | TEI | IS |
|---|---|---|---|---|
| **OP** | 0.566 | | | |
| **MEI** | 0.566 | 0.653 | | |
| **TEI** | 0.432 | 0.422 | 0.668 | |
| **IS** | 0.221 | 0.568 | 0.664 | 0.644 |

**Note:** technology innovation (TEI), Management innovation (MEI), Information system (IS), and Operational performance (OP).

**Hypothesis testing**

After the measurement model, the next step is the hypothesis which was run using the bootstrap 500 resampling technique. Table 5 predicted information related to R square and R square, the range of R square is 0.19 to 0.5, and above 0.2 is moderate (J. F. Hair et al., 2019). In Table, 85 the R square of operational performance is 0.553.

**Table.5:** *R Square*

| | R Square |
|---|---|
| **OP** | 0.553 |

**Note:** Operational performance (OP).

**F Square**

F Square, a variable in the structural model, may be affected/influenced b the number of different variables. F square is the change in R square when the exogenous is removed from the model. The effect size (f square) is more than or equal to 0.02 but less than or equal to 0.15 F squared (Ghozali, 2006) is shown in Table 6 below.

**Table.6:** *F Square*

| | Operational Performance |
|---|---|
| **TEI** | 0.022 |
| **MEI** | 0.08 |
| **IS** | 0.053 |

**Note:** technology innovation (TEI), Management innovation (MEI), Information system (IS), and Operational performance (OP).

**Q Square**

The Blindfolding Construct Cross Validated Redundancy was used as a predictor, which is the relevance of the model based on Q square criteria. The model has good predictive relevance if the value of Q square is greater than 0 (J. F. Hair et al., 2019). The below Table illustrates that the variable value is higher than 0, the value of operational performance 0.312.

**Table.6:** *Q Square*

| | SSO | SSE | $Q^2$ (=1-SSE/SSO) |
|---|---|---|---|
| OP | 1500 | 1031.653 | 0.312 |

**Note:** operational performance (OP)

**Structural Model**

Bootstrapping path coefficient results are shown below in Table 8, which include the value of P and T, the sample mean, and the standard deviation mean. T statistics values should be larger than 1.96. The value of P must be less than 0.05. These values are standard acceptable values (J. F. Hair et al., 2019). The Table below illustrates that the P value is 0.000, which means technology innovation (TEI) positively correlates with operational performance (OP). The t value is 3.148, which is greater than 1.96, supporting the proposed hypothesis. In addition, the management innovation (MEI) P value is 0.002, and the T statistics value is 3.040, which is greater than 1.96. Hence this relationship shows the positive and significant relationship between MEI and OP, supporting the proposed hypothesis. Moreover, the MEI and IS relationship P value is 0.000 and T value is 4.006, which shows a significant and positive relationship supporting the proposed hypothesis. In the same vein, the TEI and OP association P value is 0.002, and the T statistics value is 3.148, which shows a significant and positive relationship supporting the proposed hypothesis. In addition, the information system (IS) also positively and significantly affects OP, supporting the proposed hypothesis. The indirect mediating effect also shows that the information system positively and significantly mediates the relationship between MEI, TEI, and OP. These results indicate that IS is an important mediator of the relationship between TEI, MEI, and OP. Therefore, this relationship is considered a big contribution to the study. The above results are predicted in the following Table 8 below.

**Table.8:** *Structural Model*

| | Original Sample | Standard Deviation | T Statistics | P Values | Decision |
|---|---|---|---|---|---|
| **MEI -> IS** | 0.289 | 0.062 | 4.007 | 0.000 | Supported |
| **TEI -> IS** | 0.251 | 0.08 | 3.148 | 0.002 | Supported |
| **TEI -> OP** | 0.636 | 0.066 | 9.453 | 0.000 | Supported |
| **MEI -> OP** | 0.219 | 0.062 | 3.04 | 0.002 | Supported |
| **IS -> OP** | 0.109 | 0.052 | 2.086 | 0.036 | Supported |
| **MEI -> IS-> OP** | 0.289 | 0.062 | 4.006 | 0.000 | Supported |
| **TEI -> OP-> OP** | 0.153 | 0.044 | 3.504 | 0.000 | Supported |

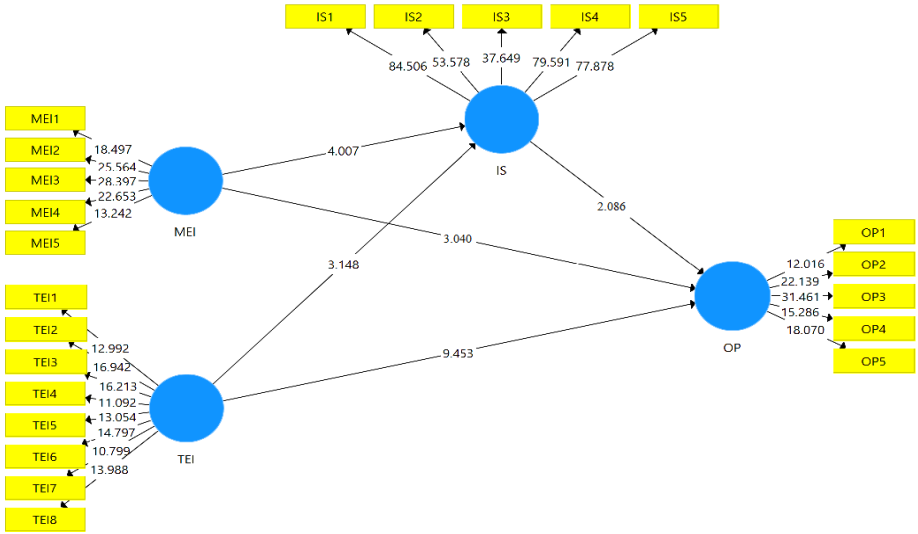


**Figure.2:** *Structural Model*

## Discussion and Recommendations

This research studied whether or not an information system may play a mediating function between managerial innovation (MEI), technology innovation (TEI), and operational performance (OP) of the textile sector in Pakistan. However, numerous studies have examined the association between MEI and OP (Mazaheri & Nazi, 2021) and TEI and operational performance (Yang et al., 2018) in developed markets. This study, though, is an attempt to put the idea to the test using data acquired in a developing nation. We now witness that the widespread MEI and TEI have had a constructive influence on company efficiency in developing economies. We discover a positive, statistically significant association between an organization's information system and its operational success, therefore offering a suitable solution to the competing arguments provided (Yang et al., 2018). In addition, our results support the resource base view hypothesis, which illustrates that a company's superior performance and long-term competitive advantage depend on its access to distinctive and valuable resources (Ferina et al., 2021). We also demonstrated that a business with innovations could flourish in a competitive market and maintain a leading position over time. We propose that TEI, as a capability, promotes a firm's internal structure and operations, thereby boosting its performance. In addition, this study assesses the key premise of the upper echelon theory, which proposes that the leadership of an organization has a decisive impact on its success and outcomes (Alessandro, 2022; Tidd & Bessant, 2020). This paper proposes that management can increase operational performance in developing economies by adopting a more creative mentality. Our investigation demonstrated that MEI and TEI had a major effect on operational performance. Tidd and Bessant (2020) explored the impact of market volatility on organizational performance and found that MEI and TEI were major predictors. In addition, Wu (2010) observed that MEI aids businesses in

numerous ways, greatly enhancing their performance and output. Further data demonstrates that MEI innovation adds to an increased operational performance by permitting the innovative utilization of previously untapped resources. Even more importantly, MEI is a key component in operational performance (Mol & Birkinshaw, 2009). Our results align with the observations of Cheng et al. (2014), from a TEI perspective, who stated that modest advancements in IT innovation could significantly influence business operations. In addition, the results demonstrate that TEI and MEI have beneficial and significant effects on the information system. These findings are corroborated by prior investigations (Allen, 2000; Fichman, 2004; Fukas & Thomas, 2021). MEI and TEI offer major positive contributions to an organization's IS, as demonstrated by our research findings. In keeping with the findings of Hamel (2006), who suggested that despite MI's perceived complexity, it can considerably boost a company's competitive edge over the long term. Additionally, in today's world of globalization, firms choose numerous approaches to implementing IS. Nevertheless, MEI has been highlighted as an important factor, particularly in growing areas. Therefore it is not the only alternative. When comparing our findings to those of Yang et al. (2018), we discover that they also believe that TEI and MEI play a significant role in strengthening the information systems and competitive advantage of enterprises. In addition, Aral and Weill (2007) noted that TEI improves the durability of business value by boosting several internal and external processes.

In addition, the IS has a large and favorable influence on OP, which is corroborated by prior research with similar findings (Zhang et al., 2019). Based on this data, the information system considerably increases operational performance. According to Kheterpal (2011), information systems enable firms to sustain a high level of performance. Moreover, Rumbayan et al. (2012) stated that information systems boost the performance of enterprises during difficult times. Therefore, managers are strongly encouraged to enhance their organization's information system, as it can significantly contribute to its competitive performance (Prasad & Green, 2015).

Moreover, information systems contribute to corporate effectiveness (Susanto & Meiryani, 2019). The information system mediates the association between MEI and OP and the relationship between TEI and OP, verifying hypotheses 6 and 7 of the study. R. C. Lee (2012) further emphasized that managers with innovative talents and competencies gain key resources that configure the information system and eventually lead to excellent performance. In summary, our research indicated that the information system is a major mediator across MEI and operational performance and TEI and OP of the textile sector in Iraq.

## Implications

This research will continue to investigate the impact of MEI and TEI on OP and the role of the IS as a mediator. Our methodology gives numerous guidance for managers and practitioners to shape their policies and strategies for IS and superior performance based on empirical facts. In emerging economies like Iraq, IS progress is the way to high OP. We advise that business organizations prioritize TEI and MEI to improve their IS and performance rather than relying on mass production and conventional approaches. Specifically, corporations working in developing nations like Iraq are

recommended to emphasize MEI and TEI highly. Organizations having a higher possibility of obtaining a competitive advantage and improved performance could advocate MEI and adopt TEI. Our results help in right decisions and assist managers or staff in producing suitable decisions, such as investing in MEI and TEI rather than riskier IS and high-performance possibilities. Due to the current trend of globalization, TEI and MEI promotion are vital. Traditional approaches may not yield satisfactory results in the contemporary day. Therefore, corporate organizations, particularly in volatile markets, require innovations to prosper in the long run. Iraq shares many similarities with other emerging and developed economies. Therefore the implications apply to both.

## Limitations and Future Research

Although this work has numerous potential contributions, it is not without limitations that must be considered in any follow-up research. Specifically, we have centered our analysis on the two key types of innovation (MEI and TEI), although performance may be influenced by process innovations, marketing innovations, etc. There is a lot of effort to be done to imagine better and, later, scientifically study this area to understand more about the individual impacts of each creation. We similarly decreased the number of indicators used to evaluate OP. Future studies should involve additional dimensions like non-operational or customer performance to describe the findings better. On the other side, fresh business models affect performance. Question of whether or whether an information system regulates the connection between creativity and performance could be explored in the future. We advise that future scholars investigate this area (financial capital) to improve their findings. This model might be evaluated on data from several sectors, including manufacturing, SMEs, and services, to study further what innovations might successfully increase the information system and performance in a given industry.

## Conclusions

This study aims to evaluate the impact of MEI and TEI in the performance of organizations, emphasizing the mediating effect of information systems. The researcher utilized Structural Equation Modelling (SEM) to empirical data from Managers to evaluate this hypothesis. The results suggest that MEI and TEI contribute significantly to operational and information system performance. In addition, this study gives a clear picture of opposing ideas concerning the relationship between information systems and operational performance and resource basis view theory. The value creation hypothesis claims that information systems have a largely favorable impact on operational performance. The resource base perspective hypothesis claims a large positive correlation between a company's distinctive resources and its success.

Moreover, the Information system mediates the relationship between MEI and operational performance, as well as TEI and operational performance. This study indicates a largely beneficial influence of information systems on operational performance, thereby verifying the value-creating idea. Given the considerable importance of MEI and TEI, our research supports the resource-based view theory. It

proposes that organizations prioritize their internal capabilities (MEI and TEI) to achieve better performance. In the increasing economy of Iraq, TEI and MEI are more crucial for the information system and operational performance. The textile industry management must pay enough attention to the setup of MEI and TEI in various departments, as it considerably impacts performance and information systems. Since these innovations (MEI and TEI) are key predictors of information systems and operational performance, it is recommended that businesses focus on both types of innovation rather than focusing on just one. To prosper in the long run, we advise CEOs and top executives to consider the application of MEI and TEI.

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