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EFFECTS OF MANAGEMENT INFORMATION SYSTEMS ON OPERATIONS DECISION MAKING PERFORMANCE AND BUSINESS OPERATIONS PERFORMANCE: MODERATING ROLE OF BUSINESS PROCESS AUTOMATION

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Research Paper

Abstract: *The research aimed to test the effect of management information systems on operational performance with mediating effect of decision-making performance and process automation as a moderating variable in the context of Saudi Arabia. For this purpose, data was collected from the 299 employees of Saudi Arabian textile companies using a convenient sampling technique. Used cross-sectional research design, quantitative research approach, and Partial Least Square (PLS)-Structural Equation Modeling (SEM). The results show that management information system capabilities have a positive and significant impact on business operation performance. Indirect mediating effect results also show the partial mediation of operations decision making performance among all management information system capabilities and business operations performance. On the other hand, process automation has also shown a significant moderating effect on the relationship of management information system capabilities and business operations performance. The study with significant mediating and moderating effect contributed a novel research finding in the extant literature. The study could also help the regulators focus on the process automation system that could increase the information system of the organization which could support operational performance.*

Keywords: *Process automation, Management information system, Operational performance, Decision Making.*

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1. Introduction

In the global competition, management information system (MIS) played an integral role in enhancing the competitive advantage of the organizations (Dominic et al., 2024). It provides an important tool in the dissemination of information process in organizations departments (Zhang et al., 2023). In the context, in the companies MIS implementations enable the seamless integration of the company's internal process which improves the easy way of decision making. This is especially relevant in industries where the ability to manage supply chains, production schedules, and customer demand relies heavily on the availability of timely and accurate information (Li et al., 2023). Furthermore, the strategic application of MIS could also play a crucial role in increasing the operational performance of firms through enhancing their ability to coordinate resources, and respond speedily as per market dynamics (Abdul Rahman et al., 2023). In other context, MIS also increase the flow of information in the organization which directly supports to the improvement of operational optimization (Hussain et al., 2023).

The MIS's significance for improving business operational performance stems from its ability to streamline the information flow and enhance decision-making at the organizational level (Etim et al., 2023). With the timely availability of data, MIS enables the managers to identify operational challenges and implement strategies to boost production which increases the operational performance (Hussain et al., 2023). Studies have shown that firms with advanced MIS are better positioned to manage costs, reduce waste, and enhance overall productivity (Hussain et al., 2023). In Saudi Arabian context, adopting strong MIS systems could be instrumental in navigating the complexities of global supply chains, which is ensuring that production schedules align with market demand, and reducing lead times (Elgendy, 2021). This leads to improved operational performance which is considered to be critical to increase the highly competitive global industry (Elgendy, 2021). These previous studies have shown that MIS is an important indicator that increase the operational performance of companies. Therefore, the study focused on the influence of MIS on operational performance.

On the other hand, MIS is also an important factor that helps to increase the operations decision-making (Joseph & Gaba, 2020). A well-functioning MIS helps to facilitate decision-making by providing relevant information to the managers (Joseph & Gaba, 2020). Through the improvement of MIS, the decision-making process could identify trends and also be able to identify informed decisions that are aligned with the company's strategic objectives (Benbya et al., 2021). The availability of real-time data also allows for more agile and responsive decision-making, which is essential for managing production schedules, inventory levels, and resource allocation in a dynamic industry like textiles (Mishra et al., 2021). In the Saudi Arabian textile sector, where firms are under pressure to maintain competitiveness and meet the demands of both domestic and international markets, improving the decision-making process through MIS could significantly enhance the firm’s operational efficiency and market responsiveness (Alfalah, 2023). In another context, the improvement in the decision-making process increases operational performance because various studies have found a significant impact of the decision-making process on operational performance (Rosin et al., 2021). When the decision-makers have greater access to reliable and

timely data through MIS then they can make more strategic decisions which helps to optimize the resources used and minimize operational deficiencies (Rosin et al., 2021). Effective decision-making could lead to improved production scheduling, better coordination between departments, and more efficient supply chain management, all of which contribute to higher levels of operational performance (Awan et al., 2021). Another study also argued that MIS increases the operational performance of the organization by improving operations and decision-making performance (Bag et al., 2021). Therefore, the study focused on the impact of MIS on operational performance through operations decision-making performance.

In other words, process automation also increases the benefits of MIS through increasing the speed, and information flow consistency (Willcocks et al., 2017). Process automation technologies help to remove routine human errors which helps to make it available for immediate decision-making (Dumas et al., 2005). In industries, where timing and efficiency are crucial, automation ensures that information system is not delayed by manual processes, allowing for faster responses to operational challenges (Rosin et al., 2021). This is the reason, the integration of automation with MIS can help optimize production lines, improve supply chain coordination, and ensure more accurate forecasting and planning (Herm et al., 2023). This combination of MIS and automation provides firms with a powerful tool to enhance their operational performance in the competitive market (Kunduru, 2023; Lee et al., 2023). Thus based on previous discussion, a study has used process automation as a moderating variable.

With the significance of MIS, process automation, and operations decision-making performance for operational performance, still in previous studies remain empirical gaps in understanding how these systems impact operational performance, especially in the context of emerging markets like Saudi Arabia. While extant studies have examined the role of MIS in operational performance, few have explored the mediating effect of decision-making or the moderating influence of process automation (Dharmawan et al., 2024; Hariyati et al., 2023; Lee et al., 2023). These previous studies enforced that further research could be explored on the mediating effect and moderating effect to clear the relationship between MIS and operational performance. Furthermore, the specific impact of these systems on Saudi Arabian textile firms has not been thoroughly investigated because previous studies were mainly focused on other countries (Lee et al., 2023), leaving a gap in the literature in the context of Saudi Arabian textile firms. This study addresses these gaps by exploring the direct and indirect effects of MIS on operational performance, providing novel insights into how decision-making performance as a mediating variable and process automation as a moderating variable contribute to these outcomes in the Saudi context (Ghaleb & Piaralal, 2023).

The study results also have some significant theoretical and practical contributions in the context of Saudi Arabian textile companies. By elucidating the critical role of management information systems (MIS) as the independent variable and process automation as a moderating variable in enhancing operational performance and decision-making processes as a mediating variable, this research offers a valuable framework for practitioners seeking to optimize their operations. The insights gained could inform strategic investments in technology and human resources which is

enabling textile firms to improve their responsiveness to market dynamics and streamline their supply chain management. Moreover, the identification of the mediating role of decision-making further emphasizes the importance of integrating effective information system practices within organizations. For academics, this study contributes to the growing body of literature on the intersection of information systems and operational efficiency, highlighting the need for further research on these dynamics within emerging markets. The study is divided into four chapters; research methodology, data analysis and results, and discussion and research limitations.

2. Theoretical Framework

While investigating the relationship between a firm resources management information system (MIS) and performance, the RBV contends that firms have the resources to generate a competitive advantage to achieve superior performance (Barney, 1991). According to Barney (1991) classification, the primary MIS resources are IS infrastructure, IS human resources, and IS administration, which stand for organizational, human, and physical capital resources, respectively. A capability can be developed upon a certain function if a company can utilize these resources to accomplish its objectives and operations (Ravichandran et al., 2005). Repetitive patterns of activity for the use of resources to develop, manufacture, and/or supply goods to the required environment are known as capabilities. Accordingly, these capabilities include managerial skills, processes, infrastructure, human capital, and competencies (Wade & Hulland, 2004). According to this study, which is based on the RBV, IS capabilities are made up of administrative, human, and infrastructure capabilities in order to build the capacity to use IS resources to gain a competitive edge.

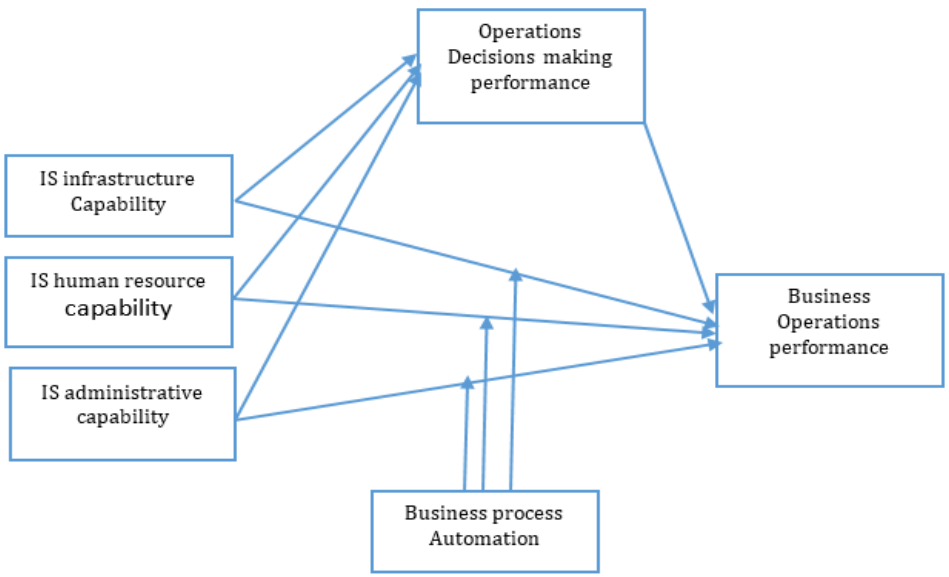

Figure 1: Research Framework

According to RBV, these immobile, heterogeneously distributed resources and capabilities are the causes of the variations in performance between the rival companies (Barney & Arikan, 2005). RBV is widely used in the literature to explain the origin of competitive advantage in the instant messaging industry. Barney and Arikan (2005) further debates regarding the adaptation of RBV to IS primarily centered on IT and IT investments. The impact of various IT/IS skills on business performance is also being explained by an increasing body of research employing RBV (Luo et al., 2012; Wang et al., 2015). In other words, process automation also increases the benefits of MIS through increasing the speed, and information flow consistency (Willcocks et al., 2017). Process automation technologies help to remove routine human errors which help to make it available for immediate decision-making (Dumas et al., 2005). Thus, based on previous discussions under the shadow of RBV theory following research framework has been formulated below(Ayo-Lawal et al., 2022).

3. Hypothesis Development

Information system infrastructure capability (ISIC) is a technology-based system that allows resources to easily be shared and stored (Anvarova, 2023). The system which includes communication networks, databases, and cloud services plays a major role in the smooth flow of information with various departments or persons as per the requirement so that operational efficiency can be increased (Yoshikuni et al., 2023). An advanced infrastructure helps enterprises simplify processes, making better decisions quickly and responding to market requirements as soon as possible which ultimately results in increased business operations performance (Khaustova et al., 2023). Yoshikuni et al. (2023) further showed that organizations with an improved technological infrastructure were actually able to achieve great operational effectiveness, through diminished general downtime and better-coordinated business processes as well enabled real-time communication. Saadilah et al. (2023) found significant empirical evidence that greater infrastructure capability drives improved operational performance (Harahap & Sari, 2023). In addition to this research, Seidu et al. (2023) also discovered that organizations with strong technical systems were better able to manage supply chains and optimize manufacturing processes which is in resulting improve operational performance. Finally, Li et al. (2022) showed that well-implemented infrastructure systems improve decision-making accuracy which helps to increased operational performance. Based on previous discussion, it is hypothesized that,

H1: *Information system infrastructure capability significantly increase to business operations performance.*

Information system human resource competence refers to an organization's employees ability to successfully communicate, exchange knowledge, and collaborate (Ha, 2020). This competence is influenced by the organization's training programs, communication methods, and cultural support for openness and collaboration (Vrontis et al., 2023). Organizations may increase operational efficiency, decrease errors, and drive creativity through encouraging employees to openly share information and interact (Vrontis et al., 2023). These results confirmed by previous empirical research that reveals the importance of information system human resource

capability to improve business operation performance. For example, Ha (2020) found that that firms with good human resource capabilities such as comprehensive knowledge-sharing practices led to advanced operational efficiency. Specifically, the study found that a well-trained workforce who feel more able to share information openly led to quicker decision-making and problem-solving. Ha (2020) further found a link between creating opportunities for collaboration among employees and improved operational outcomes (i.e. fewer production errors and faster project completion). Moussa and El Arbi (2020) found that human resource capabilities are positively related to performance. According to their research, companies with effective training programs and robust communication protocols experienced a significant enhancement in operational performance. Heslina and Syahruni (2021) further conducted a study that shows that firms with a well-developed set of human resource capabilities especially in terms of effective communication and collaboration promotion were best capable in the management of operations as were able to respond promptly to challenges. Results from Rusilowati et al. (2024) also supported these results where they highlighted the important contribution of human resource capabilities in facilitating an adaptation process to their business environment changes. Based on previous discussion, it is hypothesized that,

H2: *Information system human resource capability significantly increase to business operations performance.*

Information system administrative capability refers to structural mechanisms, policies, and leadership approaches promoting effective information flow within the organization (Al Wahid et al., 2024). These abilities help ensure that communication is clear, and decision-making processes are guided by correct, current information (Khan et al., 2024). Administrative capacity is an essential ingredient for the smooth progression of organizational operations as it pertains to resource coordination between departments and access to appropriate information available for employees thus supporting their tasks and activities (Atobishi et al., 2024; Saragih et al., 2020). Empirical studies have shown the effectiveness of information system administrative ability in improving business operations performance. Saragih et al. (2020) found that the design of organizations with more explicit administrative policies that promote high levels of communication and transparency have shown positive effects on decision making ultimately affecting firm performance. AlMulhim (2023) also found that companies with strong administrative capabilities, especially on shared information practices were more geared towards operational activities such as process optimization and response time reduction. Khan et al. (2024)) also highlight the relevance of administrative capability in improving operational performance. These studies concluded that strong organizational administration structures for knowledge-sharing is linked to improved operational and economic performance. Qatawneh (2023) also reported on the role of administration in business success, finding that well-informed administrative patterns facilitate better decision-making to improve operational performance. Thus, based on previous discussion it is hypothesized that,

H3: *Information system administrative capability significantly increase to business operations performance.*

3.1 Mediating effect of operations decision making Performance

Previous studies have shown that MIS capabilities have a relation with business operational performance. This relationship has been tested directly in most of the studies but studies have limited attention to mediating effect (El-Ebiary et al., 2023; Ha, 2020; Saad, 2023). El-Ebiary et al. (2023) also argued that when the organization has better decision making then they can increase the firm's operations performance more effectively. In another study, it was also argued that when organizations have better information systems then improve decision-making of the organization (Suartha et al., 2022; Zhan et al., 2022) that could lead to improved operations performance. Among the management information system indicators, information system human resource management where the employees and as well as top executives share knowledge to promote a joint culture is enlightenment plays an instrumental factor in enhancing decision-making processes within groups (Salem & Yousif, 2023). Employees who share their knowledge with others will improve the quality of decisions by providing decision-makers to have a wide range of information on which they can base their decisions (S. K. Gupta et al., 2023; Hunt, 2022). This is especially crucial in the dynamic business landscape where making fast, informed decisions can make or break a competitive foothold. According to Ha (2020) rapidly informed, timely, and data-driven decision-making processes help organizations in effective operations optimization, inefficiencies reduction and swiftly responding to changes that occur in the market.

M. K. Gupta et al. (2023) empirical findings that a good decision-making process can significantly help improve the performance meal indicators of efficacy and efficiency. Awan et al. (2021) also corroborated this, demonstrating that companies with excellence in decision-making perform better than others as they can navigate through the operational intricacies and uncertainties sector. Furthermore, the capability of human resources helps in making a decision, as it ensures that employees are involved in the exchange process to get appropriate information and hence make quick operations or decisions. This in turn leads to improved business performance through reduced slack, better resource utilization, and increased process efficiency (Bag et al., 2021). Further empirical findings of Aydiner et al. (2019) also found that information system human resource management is an important indicator to increase decision-making performance which increases operational performance. On the other hand, operations decision-making can be significantly improved if there is an effective capability to share information among the operational arms, which involves policies on data and informatics, and structures for processing (Aydiner et al., 2019; Rakover, 2022). Aina et al. (2016) also found that open administrative systems facilitate transparent and open information exchange, which results in improved efficiency processes resulting in higher performance. Good decision-making processes are essential for improving business performance.

On the other hand, Adamides and Karacapilidis (2020) also stated that organizations that invest in strategic decision-making can increase efficiency, reduce costs, and improve overall profitability. Bag et al. (2021) further stated that organizations that invest in strategic decision-making can increase efficiency, reduce costs, and improve overall profitability. Bag et al. (2021) also added that timely and informed decisions allow companies to better allocate resources, improve processes,

and increase operational efficiency. Monteiro et al. (2021) suggested that companies with strong governance interfere less in decision-making processes, leading to better collaboration and faster problem resolution which leads to improved performance. On the other hand, the study found a positive and significant impact of information systems administration on operational performance (Ha, 2020). Thus, MIS capabilities directly enhance business performance by encouraging better decision-making and emphasizing the role of the decision-maker as an impartial person in this relationship. Therefore, a study has formulated the following hypothesis below,

H4: *Information system infrastructure capability significantly increases business operations performance through the mediating effect of operations decision-making.*
H5: *Information system human resource capability significantly increases business operations performance through the mediating effect of operations decision-making.*
H6: *Information system administrative capability significantly increases business operations performance through the mediating effect of operations decision-making.*

3.2 Moderating Effect

The relationship between MIS and business operational performance is not clear which shown that there is a need of relationship with moderating effect. Therefore, study has focused on moderating effect of process automation. Process automation refers to the use of technology to increase efficiency by performing routine tasks without human intervention, reducing errors, saving time, and improving results (Dörnyei, 2000). The integration of information system resources and automation processes can create a unified business process. Integrated information forms the basis for the effectiveness of automation technology through enabling communication and information exchange across the organization (Ribeiro et al., 2021). Integrating automated systems into a robust infrastructure enables instant information processing, increasing the speed and accuracy of decision making (Ribeiro et al., 2021). Many empirical studies support the idea that process automation strengthens the relationship between resources and work. Abildtrup (2024) found that companies with automated processes and a strong IT infrastructure are more productive because automation allows for easier communication and instantaneous analysis of information.

Al Wahid et al. (2024) further found that when automation is combined with the best information systems, businesses can achieve faster turnaround times, reduce delays, and improve performance by improving collaboration. Ayankemi et al. (2024) further added that automation increases the efficiency of the quality process by making data consistent and reducing human errors in the process. Samokhvalov (2024) further found that organizations with automated processes and a knowledge-sharing culture experienced greater performance improvements because employees were able to focus more on results. (Yu et al., 2024) further highlighted that automation satisfies human resources by reducing manual work, and providing more time for collaboration and innovation, which has a positive impact on business. Similarly, Yu et al. (2024) showed that companies using electronic systems have greater information systems among employees which helps to increase operational performance. In the same vein, Qulmamatov (2024) also found that automation makes management systems more efficient by reducing human error and improving

communication which could help directly lead to better performance. Zhao et al. (2002) show that organizations that automate management processes are more efficient than traditional knowledge-sharing systems, which are more reliable and less time-consuming which could lead to improve operations performance. Thus, based on previous discussion, it is hypothesized that,

H7: *Process automation significantly moderates between Information system infrastructure capability and business operations performance.*
H8: *Process automation significantly moderates between Information system human resource capability and business operations performance.*
H9: *Process automation significantly moderates between Information system administrative capability and business operations performance.*

4. Research Methods

The research aimed to test the effect of management information systems (MIS) on operational performance, providing novel insights into how decision-making performance as a mediating variable and process automation as a moderating variable contribute to these outcomes in the Saudi context. A deductive quantitative research approach was selected to test the study hypothesis. This quantitative research consisted of systematic collection and numerical data analysis which is allowing generalized conclusions and insights through the structured methodology (White, 2002). This method is efficient for rapid data analysis and for identifying relationships and trends as compared to qualitative approaches (Johnson & Christensen, 2000). Furthermore, research used the cross-sectional research design to collect the data. This research design is particularly advantageous due to its ability to data at a single point in time which is resulting a lower requirement while longitudinal studies provide deeper insights into changes and developments over extended periods, though they often demand more time and resources (Salthouse, 2014). Therefore, the researcher employed the cross-sectional research design for the current study.

4.1 Survey Instrument

The survey instrument was adopted from the extant literature where it was already tested. Among the management information system capabilities, the human resource information system was measured by four items of the following study (Ololade et al., 2023), administrative information system was measured from 5 items of the following study (Majid Muhammad & Saad Aziz, 2024), infrastructure information system measured from 6 items of (Aydiner et al., 2019). Decision-making performance was measured from 6 items of (Aydiner et al., 2019). Business operations performance is measured by four items (Truong et al., 2017). Lastly, process automation which measured by 4 items of (Yu et al., 2024). These items were measured on five point Likert Scale which ranked 1 for strongly disagree and 5 for strongly agree.

4.2 Data Collection and Sampling Techniques

The data was collected from employees of textile companies in Saudi Arabia. For

this purpose, a convenient nonprobability sampling technique was used for the collection of data from the textile companies working employees. The convenient sampling technique is nonprobability sampling which involves the selection of respondents based on their easy accessibility and proximity to the researcher (Etikan & Bala, 2017). This approach is particularly useful in exploratory research where the focus is on obtaining preliminary insights and understanding the characteristics of a specific population. There was a total of 400 questionnaires were distributed among the employees of textile companies. Out of these, 299 completed questionnaires were returned, resulting in a response rate of approximately 74.75%. This response rate is considered satisfactory for survey research and is indicative of the reliability of the data collected (Asch et al., 1997). The collected data was entered in the excel sheet and then analyzed through SPSS and Smart PLS software.

4.3 Respondent's profile

Table.1 predicted values shown the respondents profile of the study where there total 299 responses of textile company's employees in Saudi Arabia. There were total 299 responses where was the slightly greater proportion of male's (53.5%) as compared to females (46.5%). The age distribution shows a notable concentration in the 26-35 age group, accounting for 33.4% of the participants, while 25.1% are aged 18-25. In terms of education, the majority possess a Bachelor's degree (50.2%), followed by those with a Master's degree (25.1%). Experience levels vary, with 40.1% of respondents having 1-5 years of experience, and only 13.0% have more than ten years. Lastly, job positions are predominantly mid-level (40.1%) and entry-level (33.4%), suggesting a varied combination of experience and qualifications among the employees surveyed. The above results are predicted in Table.1 below,

Table 1: Respondents Profile

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	160	53.5
	Female	139	46.5
Age Group	18-25	75	25.1
	26-35	100	33.4
	36-45	80	26.8
	46 and above	44	14.7
Education Level	High School	60	20.1
	Bachelor's Degree	150	50.2
	Master's Degree	75	25.1
	Doctorate	14	4.7
Years of Experience	Less than 1 year	50	16.7
	1-5 years	120	40.1
	6-10 years	90	30.1
	More than 10 years	39	13
Job Position	Entry-level	100	33.4
	Mid-level	120	40.1
	Senior-level	79	26.5

4.4 Descriptive and Reliability Analysis

Table 2 predicted values show the construct reliability, descriptive, and data normality in the questionnaire statistics. Reliability was measured with cronbach's

alpha values ranging from 0.812 to 0.892. Specifically, the constructs of information system infrastructure capability (α = 0.874, mean = 3.87) and business operations performance (α = 0.892, mean = 4.10, sd = 0.602) demonstrate excellent reliability, indicating that the items in these constructs are cohesive and consistently understood by respondents. The information system human resource capability (α = 0.812, mean = 3.67) and process automation (α = 0.821, mean = 3.75) also show good reliability. These predicted values show that the construct has proper reliability and fulfills the requirement for further regression analysis (Chung et al., 1998). Furthermore, values of skewness lie in the range of -0.210 to -0.100, which suggests a slight leftward skew in the distribution of responses, indicating that respondents tended to favor higher scores, which reflects a generally positive perception of the constructs. Additionally, kurtosis values ranging from 2.400 to 2.800 indicate that distributions are relatively normal but exhibit lighter tails compared to a normal distribution, suggesting that responses are concentrated around the mean with fewer extreme values (Kim, 2013). The common method biased value of first factor was also lower than 50% which shows no issue of biases in data. Table.2 show previous discussed results.

Table 2: Descriptive and construct Reliability

Construct	Number of Items	Cronbach's Alpha	Mean	Standard Deviation	VIF	Skewness	Kurtosis	Common method biased
ISIC	6	0.874	3.87O	0.854	1.231	-0.152	2.653	31%
ISHRC	4	0.812	3.672	0.734	1.892	-0.211	2.812	
ISAC	5	0.833	3.921	0.818	1.672	-0.122	2.534	
PRA	4	0.821	3.753	0.813	1.892	-0.183	2.723	
BOP	4	0.892	4.142	0.802	…..	-0.134	2.423	
ODMP	5	0.865	3.813	0.817	1.342	-0.162	2.551	

Note: ISIC-Information system infrastructure capability, ISHRC-Information system human resource capability, ISAC-Information system administrative capability, PRA-Process automation, BOP-Business operations performance, ODMP-Operations decision-making performance.

4.5 Hypothesis Results

When questionnaires fulfill the requirement of reliability. The next step is to test the study hypothesis. For this purpose, multiple regression analyses were conducted using SPSS software. The multiple regression results show that all management information system (MIS) capabilities have positive and significant impacts on the operational performance of textile companies in Saudi Arabia. In the MIS capabilities, firms with strong information system infrastructure (β = 0.453, p = 0.0012) benefit from better coordination of processes such as production and supply chain management, leading to improved operational efficiency. Similarly, information system human resource capabilities for information system (β = 0.349, p = 0.0045) show that skilled employees who can manage and disseminate information across the organization positively influence operational outcomes. Information system administrative capabilities (β = 0.401, p = 0.0024) further contribute to this efficiency, ensuring smooth information flow and streamlined management processes. Importantly, the mediation effects reveal that these capabilities not only have a direct impact on performance but also enhance operations decision-making, which plays a key role in optimizing business outcomes. For instance, the impact of infrastructure

capabilities on operations performance through decision-making (β = 0.303, p = 0.0067), human resource capabilities (β = 0.252, p = 0.0123), and administrative capabilities (β = 0.287, p = 0.0098) all show significant positive effects, indicating that better decision-making processes resulting from effective information system lead to improved operational performance. On the other hand, moderating effect results shown that process also positively and significantly moderates among all MIS capabilities and operational performance in Saudi textile firms. Automation technologies strengthen the influence of infrastructure capabilities (β = 0.504, p = 0.0001), human resources (β = 0.419, p = 0.0036), and administrative capabilities (β = 0.384, p = 0.0054) on operational performance by enhancing the speed, accuracy, and efficiency of decision-making processes. The R square values were also increased after moderation which also shown that strengthen of moderating variable. The above direction, mediating and moderating effect results are predicted in Table. 3 below,

Table 3: Hypothesis Results

Hypothesis	Standardized Beta	t-value	p-value	Decision
ISIC -> BOP	0.453	4.562	0.0012	Supported
ISHRC -> BOP	0.349	3.789	0.0045	Supported
ISAC -> BOP	0.401	4.121	0.0024	Supported
ISIC-> ODMP -> BOP	0.303	3.459	0.0067	Supported
ISHRC-> ODMP -> BOP	0.252	3.027	0.0123	Supported
ISAC-> ODMP -> BOP	0.287	3.307	0.0098	Supported
ISIC*PRA-> BOP	0.504	4.892	0.0001	Supported
ISHRC*PR-> BOP	0.419	4.015	0.0036	Supported
ISAC*PRA-> BOP	0.384	3.952	0.0054	Supported
Direct Effect R Square		0.473		
Moderating Effect R Square		0.534		

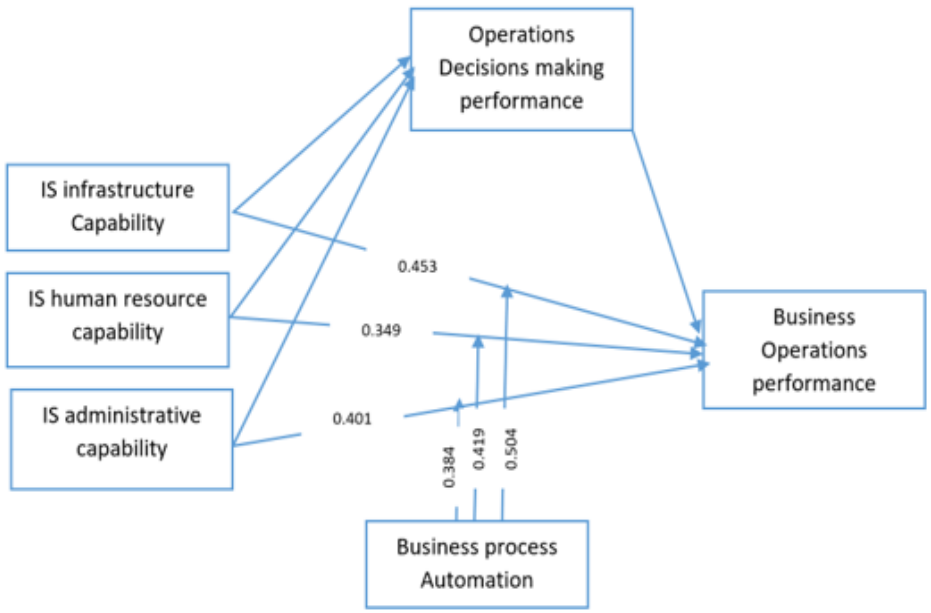

Figure 2: Beta values

5. Discussion

The research aimed to test the effect of management information systems (MIS) on business operational performance, providing novel insights into how decision-making performance as a mediating variable and process automation as a moderating variable contribute to these outcomes in the Saudi context. The findings of this research show that management information system capabilities have a positive and significant impact on business operational performance from both direct and indirect effects. These findings highlighted the critical role of MIS capabilities in increasing the business operational performance of Saudi Arabia's textile companies. Separately, information system infrastructure also has a positive and significant impact on operational performance. These results show that textile companies in Saudi Arabia have major attention to the infrastructure improvement of the textile sector to improve the operational performance. Therefore, these findings suggested that firms with advanced digital platforms and communication technologies can better coordinate internal processes, resulting in improved operational efficiency. In a highly competitive industry like textiles, where timely access to information is vital for managing supply chains, production schedules, and customer demand, having a robust infrastructure for information systems can significantly reduce operational bottlenecks. The results are further supported by the study of (Alzoubi et al., 2021; Andrade-Rojas et al., 2024) which also shows that information system infrastructure helps to reduce the uncertainties in the supply chain process which improves the coordination among departments and automatically improves the operational performance.

Furthermore, human resource capabilities also have a positive and significant impact on operational performance. This relationship shows the importance of good intellectual employees who are helping textile companies in Saudi Arabia adopt and manage an information system across the organizations. The good intellectual resource also helps to facilitate the facilitates the flow of critical operational data, enabling timely decision-making. The results are supported by the studies of (Gu et al., 2023; Nilawati et al., 2021; Votto et al., 2021), who found that human resource competencies in knowledge sharing enhance firm agility and responsiveness to market changes. In the textile sector, where quick responses to shifting market demands are essential for maintaining competitiveness, human resource capabilities in information systems ensure that operational decisions are informed by accurate, real-time data. Furthermore, information system administrative capabilities also have a positive and significant impact on the operational performance of Saudi Arabian textile companies. These outcomes show that administrative information systems in Saudi Arabia companies play an important role in driving business performance. This argument is further supported by the relevant findings of (Ha, 2020; Mahmood et al., 2023) where they also argued that well-structured administrative processes that support the flow of information across departments ensure that operations are conducted efficiently and with minimal disruption. For instance, effective administrative systems can streamline communication between production, logistics, and sales departments, which is critical in industries like textiles where timing and coordination are essential to meet customer deadlines. Several empirical findings supported the current research findings Malhan et al. (2024) in which studies also

found that well-developed administrative processes improve supply chain integration and operational coordination.

Further indirect mediating effect results show that the operations decision-making mediating effect also has positive and significant mediation among all MIS capabilities and operations performance of textile companies in Saudi Arabia. These findings show that MIS capabilities in Saudi Arabia textile companies positively and significantly improve the decision-making process of the organization which in turn positively and significantly impacting to the operational performance. These indicated that availability of timely and accurate information allows decision-makers to implement more effective strategies, reducing operational inefficiencies. The findings of the this mediating effect are supported with the studies of (Wan & Xu, 2024)) where they also indicated that better decision-making, facilitated by comprehensive information system systems which leads to more strategic and efficient resource allocation. This findings are also supported with the developed countries studies (Alzghoul et al., 2024) where they also argued that effective decision-making could lead to improved production scheduling, better coordination between departments, and more efficient supply chain management, all of which contribute to higher levels of operational performance. Another study also argued that MIS increases the operational performance of the organization through improving operations decision-making performance (Gangwar et al., 2024). Thus based on the studies, it is argued that textile companies in Saudi Arabia should focus on improvement of MIS that could increase to increase the attention of managers to improve the operational performance and competitive advantage at the national and international level.

Lastly, moderating effect results show that process automation strengthens the positive and significant impact of MIS capabilities namely information system infrastructure, information system human resource management, and information system administrative capabilities on the operational performance of textile companies in Saudi Arabia. These results showed that a good process automation system improves the effect of MIS by improving the speed, accuracy, and consistency of information flow. This argument is further supported by the conclusion of () which also recommended that process automation technologies help to remove routine human errors which helps to make it available for immediate decision-making. In industries like textiles, where timing and efficiency are crucial, automation ensures that the information system is not delayed by manual processes, allowing for faster responses to operational challenges (Abildtrup, 2024). This is the reason, the integration of automation with MIS can help optimize production lines, improve supply chain coordination, and ensure more accurate forecasting and planning. As this moderating effect has been tested for the first time so supported findings are limited but in other contexts the results could be supported by the empirical findings of (Ramadhan et al., 2024), who argued that process automation is an important factor to improve the operational efficiency of the organization. These findings emphasized that a combination of strong information system capabilities and automation is essential for improving operational performance in Saudi Arabia's textile industry. Firms that invest in these areas could be better equipped to navigate operational challenges and maintain competitiveness in an increasingly dynamic global market.

6. Practical and Theoretical Implications

The study contributed from both of practical and theoretical perspectives which are discussed below. The study has some significant practical contributions for Saudi Arabian textile companies because as per the research's best knowledge, it is the first study to examine the role of information system capabilities in mediating the effect of decision-making performance and moderating the effect of process automation on operational performance. These study findings contributed to helping decision-makers by implementing advanced digital platforms that facilitate the flow of real-time information across departments that will enable firms to improve coordination and reduce inefficiencies, which can increase the firm's decision-making process as per market demands that could increase operational performance. Furthermore, the study also contributed to knowing the importance of integration of process automation is crucial, as it amplifies the positive effects of these capabilities on operational efficiency. Through adopting automation technologies, firms could streamline decision-making processes, reduce human error, and achieve more accurate execution of business operations which are essential for competing in both domestic and international markets.

Along with practical implications, the study also has some of the theoretical implications. Firstly, the study contributes to the existing body of knowledge by expanding the understanding of how MIS capabilities impact operational performance with the novelty of mediating the effect of operations decision-making performance and moderating the effect of process automation in the context of Saudi Arabian textile companies. In the context of Saudi Arabian textile firms, this study is the first to explore the mediating role of operations decision-making in the relationship between information systems and business outcomes. The findings provide empirical evidence supporting the view that information system is not only a direct driver of business performance but also indirectly enhance operational outcomes through improved decision-making processes. Additionally, the moderating effect of process automation enriches the theoretical framework by demonstrating that technology integration can significantly enhance the benefits of information system capabilities. Thus, these findings also contributed to helping other researchers to conduct their research in the future with the extended model of the current study.

7. Conclusion

The research aimed to test the effect of management information systems on operational performance with decision-making performance as a mediating variable and process automation as a moderating variable in the context of Saudi Arabia. For this purpose, data was collected from the 299 employees of Saudi Arabian textile companies using a convenient sampling technique. Used cross-sectional research design, quantitative research approach, and Partial Least Square (PLS)-Structural Equation Modeling (SEM). The structural model results show that management information system capabilities have a positive and significant impact on business operation performance. Indirect mediating effect results also show the partial mediation of operations decision-making performance among all management

capabilities and business operations performance. On the other hand, process automation has also shown a significant moderating effect on management information system capabilities and business operations performance. The study with significant mediating and moderating effect contributed a novel research finding in the extant literature. The study could also help the regulators focus on the process automation system that could increase the information system of the organization which could support operational performance.

8. Limitations and Future Directions

The study consisted of various limitations that could be endorsed in future studies with the same authors or in other countries. Firstly, the study focused on cross cross-sectional research design where data was collected at one time while ignoring the longitudinal research design. Therefore, future research could be explored on longitudinal research design to know changes in results. Secondly, the study focused on the quantitative approach only further research could be explored on the mixed method of qualitative and quantitative approach. Lastly, the study was conducted on separate mediation and moderation in the exogenous and endogenous variables. Further research could be explored on mixed methods of qualitative and quantitative approaches.

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