



ORIGINAL RESEARCH ARTICLE

The Mediating Role of Information Technology Educational Strategy and Business Strategy in Knowledge-Based Companies Performance

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ARTICLE INFO

Article History:

Received: 2023/01/16

Revised: 2023/03/25

Accepted: 2023/04/16

Published Online: 2023/06/28

Keywords:

Information Technology Educational Strategy, Business Strategy, Information Technology Management, Knowledge-Based Companies Performance.

Number of Reference: 29

Number of Figures: 3

Number of Tables: 4

DOI:



Publisher:

Ayande Amoozan -e- ATA (AAA)

ABSTRACT

Purpose: The research has studied the mediating role of information technology educational strategy and business strategy in information technology management on the performance of knowledge-based companies.

Method: The statistical population includes 5643 experts and managers of the Ports and Maritime Organization; The research sample was determined 360 according to Cochran's formula through simple random and stratified. A standard questionnaire and the structural equation modeling technique were used to collect and analyze data using SPSS and SMRATPLS statistical software.

Findings: Information technology management has a positive and significant effect on the educational strategy of information technology. The educational strategy of information technology has a positive and significant effect on the performance of the company. Information technology strategy has a positive and meaningful mediating role in the relationship between information technology management and company performance. Business strategy is related to business applications and should be aligned with business strategy. Business strategy has a positive and significant mediating role in relation to information technology management and company performance. Information technology management has a positive and significant effect on company performance.

Conclusion: Adopting Information technology management practices brings the company closer to aligning Information technology and business goals, which in turn improves company performance. Higher levels of Information technology management sophistication ensure an appropriate level of fit between Information technology and business strategies, which then leads to the appropriate selection and use of Information technology resources. ©authors

► **Citation:** Najjar, A., & Farjam, S. (2023). The Mediating Role of Information Technology Educational Strategy and Business Strategy in Knowledge-Based Companies Performance. *The International Journal of Learning Space Studies (IJLSS)*, 2(2): 1-12.

Introduction

In today's business environment, Information Technology (IT) has become a vital element for business activities (Banger, 2022). Information Technology Management (ITM) includes managerial decisions to plan, organize, control, and direct information technology. ITM includes a wide range of advanced technical and organizational capabilities and multi-million dollar expenditures to improve the efficiency of company strategies and business performance (Qazi Nouri et al., 2023). Also, global competition and economic growth have caused an increase in investment in the management and application of IT strategy (Ilmudeen et al., 2021). IT is usually considered part of the company's business processes. Accordingly, IT cannot create value or become the foundation of the company's competitive advantage (Kesting et al., 2015). Research shows that to use IT capabilities, the company's internal processes must be aligned with IT strategies (Teixeira et al., 2023). But still, many organizations are not able to do this important strategic planning, because they do not have the proper information and experience in strategic planning and benefit from IT. Therefore, the strategic plan for IT must be formulated carefully and in line with the strategic goals of the organization (Casis et al., 2020).

The complexity of the environment in the competitive field of business and the increase in customer expectations have revealed the need to be aware of the organization's strengths and weaknesses and continuous improvement of productivity. Therefore, one of the basic concerns of today's organizations is to achieve a comprehensive, reliable, and flexible performance evaluation method, so that by resorting to it, they can obtain accurate and sufficient information about their current position and, looking to the future, from past mistakes (Xu et al., 2019).

Therefore, based on research literature, the impact of ITM on company performance has been investigated from different approaches. For example, ShATILA et al. (2019) showed that information technology tools and ITM increase the company's internal capacities and improve performance. Nithya et al. (2021) showed that IT strategy improves company performance. The alignment of IT and business has been proven by many researchers which can improve the organization in different ways; These procedures include maximizing the investment in IT, helping to identify the real value, and helping to improve the performance of IT (Lin et al., 2020).

The level of integration between business and IT indicates the dimension of organizational management, And the creation of value that brings the participation of IT in business shows the complexity of the organization. These two dimensions can reflect the features of alignment which consists of features of operational resources, features of strategic resources, and strategic defensive features. In addition, it tries to show the alignment levels of business strategy and IT, and what the organization should do to improve the alignment level (Gadatsch, 2023).

According to the research done, this research seeks an answer to how the mediating role of IT strategy and business strategy are in the process of ITM and company performance.

Literature Review

Based on contingency theory and configuration theory and the above discussion, two research questions have been identified that were conceptually answered and tested empirically (Aversa et al., 2020). First, a company should seek to achieve strategic triple alignment between business, IT, and marketing strategies as this will enable the company to support and support its business strategy with IT being an integral part of the marketing strategy. and organization that takes into account dramatic changes in the overall business environment (Barth et al., 2017). This triple strategic alignment is more comprehensive and complete because the alignment of multiple strategies makes the company act as a whole and achieve a higher level of alignment and better performance. By considering multiple organizational strategies, triple strategic alignment provides a richer and more realistic view of strategic alignment. Few studies

have tested that multifactorial alignment enables a firm to perform Increase. Therefore, this research states that triple strategic alignment will have a beneficial effect on business performance (Broekhuizen et al., 2018). The idea of triple strategic alignment is recorded in the theoretical structure at a higher level of the individual elements of business, IT, and marketing strategies. The hypothesis is that if business, IT, and marketing have an effect on triple strategic alignment, the triple strategic alignment model should perform better compared to the direct effect model with no unobserved structure (Alsurmi et al., 2020).

In addition, based on this general hypothesis, three triple strategic configurations can be identified by considering different strategic configurations of companies. Futurists, advocates, and analysts are expected to be supported and empowered by various IT and marketing strategies, leading to triple strategic alignment and better business performance (Cosenz et al., 2018).

Futurists tend to be flexible and innovative in their markets. They are leading innovators and invest heavily in product research and development and environmental screening so that they can continuously produce new products and enter new markets (Vinayavekhin et al., 2021). As far as information technology is concerned, they emphasize flexibility so that they can make faster strategic decisions. Considering the business environment, futurists tend to consider the industry from their own and customers' perspectives, they collect detailed information about customers to meet their needs (Yoo et al., 2022). Therefore, it is plausible that futurists with a flexibility and innovation orientation will perform better when they are supported by an IT flexibility strategy and a customer-focused marketing strategy, which would be an ideal state of strategic alignment. The triad is for futurists because all three strategies are compatible with each other (Garousi Mokhtarzadeh et al., 2020). In line with this, futurists who are supported by an IT flexibility strategy or a customer-focused marketing strategy (not both at the same time) can be an intermediate state of triple strategic alignment because only two strategies match. They have, while the third case is not like this. When futurists are not supported by an IT agility strategy and a customer-focused marketing strategy, it can lead to misalignment and poor performance. This provides insight into whether a company that has achieved triple strategic alignment can perform better than a company that has not (Kulshreshtha et al., 2021).

Advocates emphasize cost reduction, avoiding organizational change, and maximizing production effectiveness and efficiency. Therefore, they can be better supported by an IT efficiency strategy that is oriented towards internal and inter-organizational efficiencies and long-term decision-making (Butt, 2020). Considering the business environment, they focus on competitors and defend their competitive position against competitors by focusing on a limited number of key criteria such as cost. Therefore, efficiency-oriented defenders and competitors should be supported by an IT efficiency strategy and a competitor-focused marketing strategy, which can be an ideal state of triple strategic alignment for defenders supported by an IT efficiency strategy, or competitor-focused marketing strategy. are supported by the competitor (not simultaneously supported by both), which is an intermediate state of alignment, and defenders that are not supported by an IT efficiency strategy and a competitor-focused marketing strategy are considered misaligned (Hanafizadeh et al., 2020).

A third general configuration of triple strategic alignment considers analysts to be a combination of futurists and advocates (Force, 2022). On the one hand, they monitor customer reactions and perform sophisticated analysis on the customer, on the other hand, they scrutinize competitors' activities extensively. Therefore, they focus on maintaining a stable range of core

products and closely observe competitors' activities and look for new market opportunities. They are better supported by a comprehensive IT strategy that enables them to make comprehensive and complete decisions (Kar et al., 2021). Similarly, three different states of triple strategic alignment can be distinguished for analysts: the ideal state refers to analysts who are supported by a holistic IT strategy and a marketing strategy that focuses equally on competitors and customers, the moderate state refers to analysts who refer to those supported by IT comprehensive strategy or marketing strategy focused on competitors and customers, misalignment refers to analysts who are not supported by IT comprehensive strategy and marketing strategy (Fumagalli et al., 2021). Therefore, the objectives of the research are:

- 1- Identifying the impact of ITM on IT strategy
- 2- Identifying the impact of IT strategy on company performance
- 3- Identifying the mediating role of IT strategy in the relationship between ITM and company performance
- 4- Identifying the impact of ITM on business strategy
- 5- Identifying the impact of business strategy on company performance
- 6- Identifying the mediating role of business strategy in relation to ITM and company performance

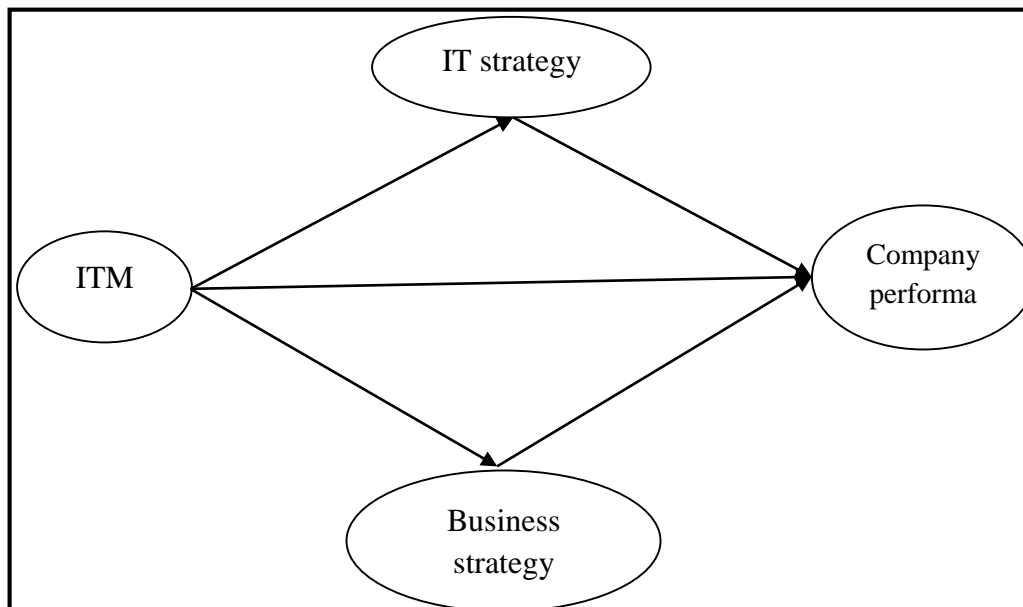


Figure 1. Conceptual model of research (Ilmudeen et al., 2021)

Method

This research is practical in terms of purpose because the purpose of applied research is to solve problems and finally obtain information to make decisions and solve urgent needs and problems. In other words, the purpose of these studies is to develop practical knowledge in a specific field and they move towards practical application. The statistical population of this research includes experts and managers of the Ports and Maritime Organization, whose number is 5643. The sample is calculated using Cochran's formula, 360. The measuring tool in this research is a questionnaire. The questionnaire used in the present research is a questionnaire. The validity of the questionnaire has been confirmed based on the CVR index. The model has been analyzed using the method of structural equations in SMARTPLS software. Based on the external model in Table 1, the confirmatory factor analysis of 22 items is specified.

Table 1. Questionnaire questions

Dimension	Objects	Symbol	CVR	Factor load
IT management	In the company, the system of application, prioritization, financing, monitoring and implementation of investment decisions in the field of information technology is implemented.	VAR00001	0.8	0.555
	The directors and board of directors oversee the sustainability of the company's IT strategies.	VAR00002	0.6	0.446
	The company has embedded IT implementation processes as a core unit in the company.	VAR00003	0.8	0.759
	The organization has prioritized investment in information and communication technology management.	VAR00004	0.8	0.720
	A supervisory board for information and communication technology management has been formed in the company.	VAR00005	0.8	0.724
Business Strategy	The company intends to compete with the competitors by reducing the price	VAR00006	1	0.792
	The company intends to compete with the competitors by increasing the quality	VAR00007	0.8	0.832
	The company intends to compete with its competitors by innovation in services	VAR00008	0.8	0.759
	The company intends to compete with its competitors by developing new products	VAR00009	0.8	0.549
	The company intends to compete with its competitors by expanding the number of services	VAR00010	1	0.543
IT strategy	Information technology strategy reduces costs.	VAR00011	0.8	0.521
	Information technology strategy has increased the quality of our services compared to competitors.	VAR00012	0.8	0.482
	Information technology strategy has caused a competitive advantage in the market.	VAR00013	0.8	0.523
	Information technology strategy has increased the efficiency of the organization.	VAR00014	0.8	0.697
	The strategy of information technology has improved the understanding of the market and the needs of customers.	VAR00015	0.8	0.727
Company performance	Return on investment in our company is better than competitors.	VAR00016	0.8	0.663
	Return on equity in our company is better than competitors.	VAR00017	0.8	0.697
	Asset value in our company is better than competitors.	VAR00018	0.8	0.723
	The level of productivity and profitability in our company is better than competitors.	VAR00019	0.8	0.631
	The company life cycle in our company is better than competitors.	VAR00020	0.6	0.719
	Sales growth in our company is better than competitors.	VAR00021	0.8	0.586
	The market performance in our company is better than competitors.	VAR00022	0.8	0.533

Findings

Out of 313 respondents, 87% are men and 13% are women. 54 respondents have less than 5 years of work experience. Also, 54 people have work experience between 6 and 10 years. 72 people with work experience between 11 and 15 years and finally 216 people have work experience above 16 years. There are 216 people with less than a BA degree and 133 people with a MA degree. Finally, 11 people had Ph.D. degrees. In Table 2, the prerequisite indicators for the design of the structural equation model using the partial least squares method are specified.

Table 2. Collinearity index, variable validity, and composite reliability, Cronbach's alpha and RHO index

Variable	VIF	AVE	Cronbach's alpha	CR	Rho
IT management	1.500	0.563	0.937	0.816	0.816
Business Strategy	1.193	0.519	0.945	0.893	0.824
IT strategy	1.239	0.534	0.862	0.740	0.810
Company performance	1.170	0.611	0.851	0.755	0.738

Based on statistical standards, all indicators were confirmed. Also, divergent validity was confirmed by Fornell-Larker method (Table 3).

Table 3. Fornell and Locker method

	IT management	Business Strategy	IT strategy	Company performance
IT management	0.896			

Business Strategy	0.826	0.980		
IT strategy	0.734	0.860	0.911	
Company performance	0.546	0.637	0.845	0.947

Also, the HTMT table was confirmed (Table 4).

Table 4. The results of HTMT method to check divergent validity

	IT management	Business Strategy	IT strategy	Company performance
IT management				
Business Strategy	0.748			
IT strategy	0.732	0.649		
Company performance	0.511	0.542	0.536	

In the following, the graphic model resulting from SMARTPLS software is specified in Figure 2 and 3.

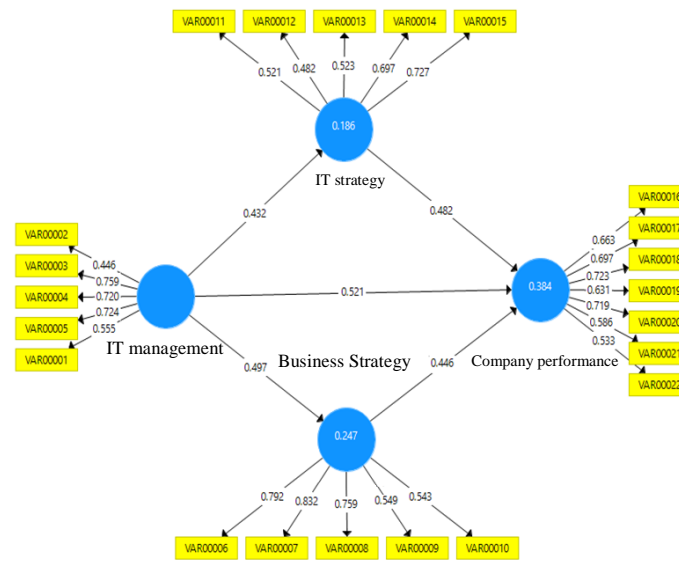


Figure 2. Factor loading of the research model

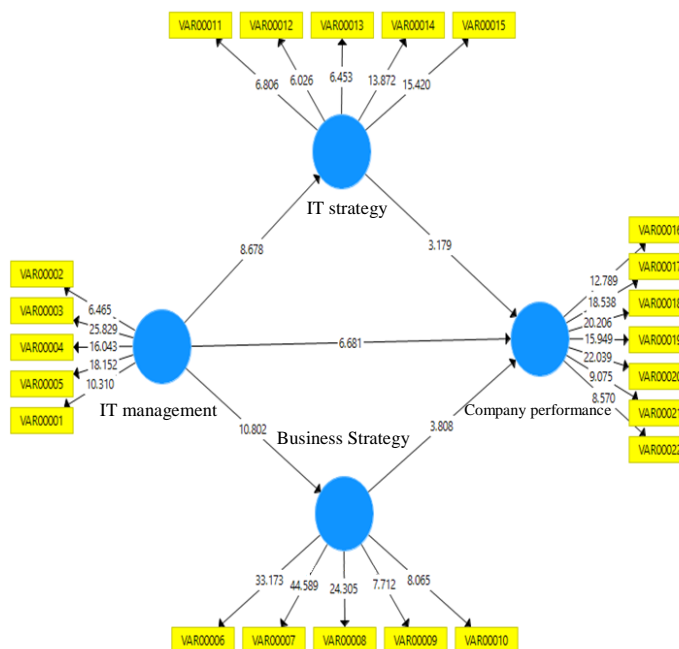


Figure 3. Bootstrapping t statistic of the research model

The factor load of observation has a greater value of 0.3 in all cases, which shows that there is a good correlation between the observable variables and the related hidden variables. Therefore, it can be concluded that each main variable has been measured correctly and considering the findings of this scale, the research hypotheses can be tested.

Based on the results obtained from the structural equation model, the coefficient of information technology management on information technology strategy is higher R 0.3 (0.432). The significance level is less than 0.05 (0.000). Therefore, with a confidence of 0.95, it can be said that information technology management has a positive and significant effect on information technology strategy. Based on the results obtained from the structural equation model, the path coefficient of information technology strategy on company performance is higher than 0.3 (0.482). The significance level is less than 0.05 (0.000). Therefore, with a confidence of 0.95, it can be said that the information technology strategy has a positive and significant effect on the company's performance. To test the effect of a mediating variable, there is a widely used test called the Sobel test, which is used to determine the significance of the mediating effect of a variable in the relationship between two other variables.

The path of the independent variable of IT management, the mediating variable of IT strategy and the dependent variable of company performance

The above values for this path are:

a: 0.432

b: 0.482

S_a: 0.040

S_b: 0.039

$$Z - Value = \frac{a \times b}{\sqrt{(b^2 \times s_a^2) + (a^2 \times s_b^2) + (s_a^2 \times s_b^2)}} = \frac{0.432 \times 0.482}{\sqrt{(0.482^2 \times 0.040^2) + (0.432^2 \times 0.039^2) + (0.040^2 \times 0.039^2)}} = 8.615$$

As seen, the Z-Value of the Sobel test was equal to 8.615, which is greater than 1.96, it can be stated that at the 95% confidence level, the mediating variable effect of information technology strategy in the relationship between information technology management and company performance It is meaningful.

Based on the results obtained from the structural equation model, the path coefficient of information technology management on business strategy is higher than 0.3 (0.497). The significance level is less than 0.05 (0.000). Therefore, with a confidence of 0.95, it can be said that information technology management has a positive and significant effect on business strategy

Based on the results obtained from the structural equation model, the reliability path coefficient of the business strategy on the purchasing company's performance is higher than 0.3 (0.446). The significance level is less than 0.05 (0.000). Therefore, with a confidence of 0.95, it can be said that business strategy has a positive and significant effect on the performance of the company.

The path of the independent variable of information technology management, the mediating variable of business strategy and the dependent variable of company performance

The above values for this path are:

a: 0.497

b: 0.446

S_a: 0.038

S_b: 0.036

$$Z - Value = \frac{a \times b}{\sqrt{(b^2 \times s_a^2) + (a^2 \times s_b^2) + (s_a^2 \times s_b^2)}} = \frac{0.497 \times 0.446}{\sqrt{(0.446^2 \times 0.038^2) + (0.446^2 \times 0.039^2) + (0.038^2 \times 0.036^2)}} = 9.385$$

As seen, the Z-Value of the Sobel test was equal to 9.385, which is greater than 1.96, so it can be stated that at the 95% confidence level, the effect of the moderating variable of business strategy in the relationship between IT management and company performance is meaningful. Based on the results obtained from the structural equation model, the reliability path coefficient of information technology management on company performance is higher than 0.3 (0.450). The significance level is less than 0.05 (0.000). Therefore, with a confidence of 0.95, it can be said that information technology management has a positive and significant effect on the company's performance.

Discussion

Information technology management has a positive and significant effect on IT strategy. Adopting ITM practices brings the company closer to aligning IT and business goals, which in turn improves company performance. Higher levels of ITM sophistication ensure an appropriate level of fit between IT and business strategies, which then leads to the appropriate selection and use of IT resources. Furthermore, the greater the shared knowledge of senior managers and mutual trust (the roles that IT provides in maintaining/increasing the company's competitiveness, the development of a high-quality set of business and IS programs, and the stronger agreement on IT management issues), the more likely the company will succeed in More use of information technology. The results obtained are in line with researches (Ilmudeen et al., 2021; Adams et al., 2019; Bazrafshan et al., 2017; Behzadi et al., 2019).

IT strategy has a positive and significant effect on company performance. IT can be used to (1) reduce costs by refining productivity and efficiency; (2) increase revenue by fully exploiting opportunities through existing or established customers, channels and products/services; or (3) reduce costs and increase revenue at the same time. The study of Mithas and Rast (2016) showed that at low levels of IT investment, the company may need to choose between increasing revenue and reducing costs, but at higher levels of IT investment, dual emphasis in IT strategy or strategic ambivalence of technology. Information is increasingly beneficial to companies. IT strategy has a positive and meaningful mediating role in the relationship between ITM and company performance. Therefore, by applying information technology strategy, the impact of ITM on company performance increases. The researchers believed that IT is a necessary management issue in the performance of the company. IT plays a strategic role and is believed to be the core of business operations in today's fast-paced business environment.

To understand how IT strategy acts as a mediator in ITM and company performance relationship, it is obvious that a company should focus on strategic directions when choosing different IT strategies, so ITM alone can achieve The performance of the company is not enough. A company can choose IT strategy as the most important strategic objective, which can be revenue enhancement, cost reduction, or a dual emphasis where both objectives are

pursued. A company's physical IT systems can not only be a source of sustainable competitive advantage because they are easily replicable, but also have unique capabilities such as the ability to manage intangible assets and incorporate IT business strategies. ITM has a positive and meaningful effect on business strategy. In a typical company, IT supports businesses by collecting and analyzing operational data and customer and supplier information to gain competitive advantage and drive dramatic change in companies through performance improvement. In addition, the application of IT is deeply woven into business operations while requiring large investments and often requiring sustainable management practices. The role of IT managers as strategy implementers who ensure that IT aligns with business strategy. IT strategies are usually dependent on business and business strategy - IT alignment is the extent to which IT strategy facilitates and drives business strategy.

Researchers warrant new approaches to exploit synergies between strategic business units and functional-level activities for the link between IT strategy and business in modern business enterprises.

Business strategy has a positive and meaningful effect on company performance. Business strategy is related to business applications and should be aligned with business strategy. Accordingly, Awwad et al. (2022) argued that while IT practices remain integrated into functional-level strategies, they play several important roles in business strategy and have significant organizational performance implications. In many cases, the business strategy supports business operations, for example, for research and development, the business strategy integrates various applications to enhance knowledge generation, which may cover general applications (software packages) for specific applications.

Business strategy has a positive and significant mediating role in relation to ITM and company performance. IT creates business value by improving the operational efficiency of intermediary business processes. Technology-based strategy alone does not directly affect firm performance, while it advances or hinders a firm's strategic capabilities and in turn, has a positive effect on firm performance. Strategic and operational issues are considered when determining business units' IT requirements, overseeing the creation of IT-based business solutions, and verifying the alignment of these solutions with current and planned business strategies. Likewise, the mediating role of business strategy has been highlighted in previous studies, for example, alignment between core business strategy and IT strategy fully mediates the impact of IT governance mechanisms on firm performance.

ITM has a positive and significant effect on company performance. A company's performance is largely determined by how effectively and efficiently the company's business, IT, and marketing strategies can be implemented and executed to support each other. The basis of all strategic orientations of the organization is ITM. The strategic directions of IT are flexibility, efficiency, and comprehensiveness. Strategic marketing orientations are customer-focused and competitor-focused.

Conclusion

Considering the fit between specific strategic orientations, this study states that a company has an ideal strategic alignment based on its specific strategic orientations, and this alignment enables the company to maximize its performance. Finally, based on the obtained results, the following suggestions are presented:

1- Based on the result of the first hypothesis, it is suggested to try to improve the infrastructure of ITM, the provision of software and hardware, and related conditions.

2- Based on the result of the second hypothesis, it is suggested that an appropriate IT strategy be arranged in the local organization.

3- Based on the result of the third hypothesis, it is suggested that for the implementation of an IT strategy, the necessary physical resources, and knowledge should be provided in the organization and the conditions of IT should be consistent with the related strategy.

4- Based on the result of the fourth hypothesis, it is suggested to use modern science and IT changes in the organization to improve the business situation.

5- Based on the result of the fifth hypothesis, it is suggested to use the research and development unit to identify the needs of society and increase the quality of the organization's services.

6- Based on the results obtained from the sixth hypothesis, it is suggested to seek advice from experts and specialists to match IT with business strategy.

7- Based on the results obtained in the seventh hypothesis, it is suggested that managers use up-to-date information technologies in the implementation of the organization's processes.

Declaration of Competing Interest

The author declares that he has no competing financial interests or known personal relationships that would influence the report presented in this article.

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