“Information technology and its impact on strategic performance in Yemeni telecommunications companies”

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INFORMATION TECHNOLOGY AND ITS IMPACT ON STRATEGIC PERFORMANCE IN YEMENI TELECOMMUNICATIONS COMPANIES

Abstract

Information technology is critical to improve and raise the level of strategic performance of organizations. This study aimed to investigate the impact of information technology and information technology dimensions (hardware, software, databases, communication networks, and personnel skills) on the strategic performance of Yemeni telecommunications companies and assess the overall level of information technologies and strategic performance of respective companies. The study adopted a descriptive-analytical approach and used a questionnaire for data collection. The sample of the study comprised 560 employees out of the total population of 2,238 employees in chosen Yemeni companies. The selected employees included CEOs, deputy executive managers, department managers, section heads, supervisors, and specialists due to the relevance of their roles to information technology and strategic performance. Accordingly, 479 questionnaires were successfully retrieved and analyzed. The findings showed that information technology positively impacts strategic performance ($R2 = 0.385$; $p < 0.05$), indicating that information technology plays a significant role in enhancing strategic performance. The dimensions (hardware, databases, and personnel skills) have a statistically significant effect on strategic performance ($\beta = 0.212$, 0.205, 0.340; $p < 0.05$), while software and communication networks showed no statistically significant effect ($\beta = 0.043$, 0.033; $p > 0.05$). Additionally, the findings revealed a high level of information technology and strategic performance in Yemeni companies. These findings indicate that Yemeni telecommunications companies place significant emphasis on information technology and strategic performance.

Keywords information technology, strategic performance, telecommunications companies

JEL Classification M10, M15

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INTRODUCTION

Modern organizations operate amidst numerous changes in the business environment, for example, the rapid technological advancements that have led to market expansion and increased competition, both locally and globally. For this reason, businesses need to reconsider their methods and strategies to keep pace with the continuous changes in the business environment, which in turn improves their performance (Yassine, 2022).

The advent of information technology has enabled management to analyze vast amounts of data efficiently, facilitate informed decision-making, and enhance productivity and competitiveness (Bouchachi, 2020). Furthermore, information technology has become indispensable across all organizational functions, serving as a crucial determinant of performance success or failure, making effective operations inconceivable without it (Al-Manaseer et al., 2019).

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Strategic performance is critical for all stakeholders. It refers to the end result of all activities of the company (Al-Mulla & Al-Yasiri, 2017). It represents a comprehensive framework of financial, operational, marketing, and human performance metrics within organizations (Latrash, 2018).

Practically, telecommunications companies are considered one of the most important organizations in the Republic of Yemen and a crucial pillar of the national economy. However, the Ministry of Communications report revealed a decline in mobile phone penetration from 5.09% in 2020 to 4.43% in 2021 (Ministry of Communications and Information Technology, 2021). Furthermore, the Sana'a Center for Strategic Studies noted a decrease in the penetration rate of mobile services from 46% in 2014 to 42% in 2019, which is below regional and global averages (Al-Bashiri, 2021). Al-Bashari and Abdullah (2021) highlighted shortcomings in the performance methodologies that prioritize financial over strategic performance. Additionally, Al-Ansi (2019) determined that the efficiency levels of Yemeni telecommunications companies' performance were inadequate.

Information technology plays an important role in raising organization's strategic performance. It is one of the best modern methods that focus on improving and developing the performance of various operations, raising the level of learning and growth, meeting customers' needs and requirements, and achieving their satisfaction to enhance and raise financial performance. Therefore, more studies and research are required on information technology and its impact on strategic performance.

1. LITERATURE REVIEW

Technology, with its various elements and characteristics, has become one of the basic strategic resources that contribute significantly to the development and success of organizations. It plays an effective role in converting inputs into accurate outputs while improving performance and speed of accomplishing tasks, enhancing organizational survival, growth and profitability. The main objective of information technology is to develop information technologies and use them to plan and organize activities and achieve the strategic objectives of an organization (Al-Manaseer et al., 2019).

Information technology is defined as "the interaction of human resource skills, hardware, equipment, communication networks, software, databases, and information security to process, store, retrieve, and make data available to various management levels in a timely and appropriate manner" (Alromimah & Alhakimi, 2024). Turban et al. (2003) defined information technology as "the technological aspect of an information system that includes physical components, software, database, networks and other media" (Muslim, 2015).

This study considers information technologies as an integrated system of computer hardware, programs, systems, databases, communication networks, and personnel skills utilized in Yemeni telecommunications companies to collect, process, organize, store, and circulate data and information between departments and related parties. Information technology can be measured through five dimensions: hardware, software, databases, communication networks, and personnel skills.

Hardware includes all physical means and tools used in data processing, such as input means, central processing unit, output means, and other means of connecting parts (Krajewski & Ritzman, 2006). Procedurally, it is defined as the physical components of a computer and includes all the units of computers used to process and store data in the company.

Software consists of detailed systems and instructions that help the computer carry out the required tasks, process, document, record, and display data as final outputs to perform the work (Al-Hamdani, 2015). It is procedurally defined as the non-physical components of the computer. Software includes all the programs and systems necessary to operate the computer and organize the work of its various units. In addition, detailed instructions and commands help the computer carry out the tasks required in data entry, processing, documenting, recording, and presenting them in the form of information and reports as final outputs to perform work in the company.

Database is a set of logical data elements linked to each other by mathematical relationships, stored in a computer in an organized manner to facilitate handling and searching within them in addition to or modification to them (Bouchachi, 2020). Procedurally, it is defined as an integrated set of data linked to each other by reciprocal relationships stored in the company's computers in an organized manner.

Communication networks are the basic infrastructure for communication between computers and software responsible for managing communication between hardware. They enable a computer network to connect a group of computers using communication media to form a network through which data and information are exchanged between the computer systems connected in the network (Al-Taher & Al-Arabi, 2019). They are procedurally defined as a network of devices and means of communication between departments, sections, and branches linked to each other and used in the company.

Personal skills include the basic elements of the use of computers based on the information system and the individuals who operate the systems, from the end-users to specialists in the information system (Al-Jubouri, 2016). Procedurally, they are defined as the skills of managing, operating, and using information technology systems for computer hardware, systems, programs, databases, and communication networks. Such skills include the skills of specialized individuals and those in charge of managing and operating information technology and company users.

Strategic performance is defined as "the outputs of the integrated work system with all its available resources, which reflect the efficiency and effectiveness of investing inputs to obtain a sustainable competitive advantage for the long term" (Mia et al., 2021). Wheelen and Hunger (2010) defined strategic performance as "the end result of the organization's activity and a reflection of how the organization uses its material and human resources for the purpose of achieving its objectives" (Al-Rawadiyah, 2023).

This study considers strategic performance as the overall performance of Yemeni telecommunications companies represented in the final results achieved from the interaction of the companies' activities and resources through the optimal use of resources to achieve the company's goals. Strategic performance can be measured according to the balanced scorecard through four dimensions: financial dimension, customer dimension, internal operations dimension, and learning and growth dimension.

The balanced scorecard (BSC) was developed in the early 1990s by American researchers (R. S. Kaplan and D. P. Norton) as a framework for assessing strategic performance across financial and non-financial dimensions within organizational structures (Al-Hosaini et al., 2023). Kaplan and Norton (1996) characterized the BSC as a management approach that operationalizes an organization's vision and strategy through various performance measures, encompassing financial and non-financial aspects across four key dimensions (Al-Omush et al., 2023).

The financial dimension refers to the organization's ability to achieve the interests of shareholders and owners by achieving the financial objectives (profitability). It includes the size of income, its operational level, and the return on invested capital through its focus on the investment return and equity return (Al-Sudani & Shawna, 2017). This dimension focuses on the financial aspect of the organization's performance, such as returns, profits, expenses, asset value, and shareholders' rights. The importance of this dimension is highlighted in the fact that the main goal of the organization's existence is to achieve profits and provide the necessary resources for continuity and development (Al-Jubouri, 2016).

The customer dimension focuses on the relationship with the customer. Improving the institutional performance requires efforts to meet the customers' needs and aspirations (Barakat, 2005). This dimension includes several indicators such as market share, retention of existing customers, acquiring new customers, customer satisfaction, and customer leakage rate (Tuan, 2020).

The internal operation dimension examines the organizational performance regarding accuracy, speed, cost, and productivity. Internal processes encompass innovation to enhance goods and ser-

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vices, production and distribution operations, and after-sales services. It intersects with the financial performance aspect by enhancing internal operational efficiency. It aligns with customer relations through value creation and connects to the education and growth dimension through causal relationships (Haykal, 2015).

The learning and growth dimension identifies and diagnoses the infrastructure on which the organization depends for its work because any organization needs the appropriate resources, systems, and facilities to achieve its goals (Al-Jubouri, 2016). This dimension ensures the organization's ability to renew as it is the prerequisite for continuity and long-term survival and aims to guide individuals toward the development and continuous improvement necessary for the survival and continuity of the organization (Bouchachi, 2020; Khatoon & Farooq, 2014). It can include other issues such as employee satisfaction and development of their skills, training and learning activities, and encouragement of innovation (Rehab et al., 2019).

Strategic performance is the decisive factor for the success or failure of any organization. Its importance lies in that it represents the overall performance of the organization because it covers all areas of performance (financial, marketing, operational, human), focuses on achieving the goals of all stakeholders and on the future aspects of the organization, allows the organization to control resources and coordinate operations. It also contributes to launching creativity, employing modern technology, improving organizational excellence and the overall performance of the organization, enhancing its competitiveness ,and helping it to face changes and ensure its survival and growth in the market.

Many previous studies addressed the impact of information technology on performance in various organizations and in different work environments. For example, Barakat (2023) confirmed that information technology improved public entities' institutional performance. Al-Mahrami and Alawi (2023) found an impact of information technology on institutional performance in the Yemen General Electricity Corporation. Al-Khafaji (2022) concluded that there was interest in applying product quality dimensions in the oil field, which would mediate or enhance the impact of technology strategy on strategic performance. Tirtayasa and Imaroh (2021) found that the level of performance of PT. Inti Nusa Permata Mining Company in the state of Lampung in Indonesia was very good, and the level of performance of the company in the financial dimension was weak.

Bouchachi (2020) aimed to explore the impact of the use of information and communication technology on the strategic performance of the Algerian telecommunications corporation in Ouargla. The results showed a high level of information and communication technology and strategic performance; the relationship between ICT and strategic performance was fairly positive. Al-Bashabsha (2019) sought to identify the impact of electronic management on the organization's performance in Jordanian telecommunications companies. The study found that the level of electronic management and the level of performance of the institution came at an average general level. In addition, electronic management had a positive impact on the performance of Jordanian telecommunications companies.

Fanni (2018) aimed to determine the impact of information and communication technology on the institutional performance of a group of Algerian public banks. The results showed a positive impact of information and communication technology on institutional performance. Talabani (2017) aimed to study the correlation between information technology and organizational performance at the University of Babylon. The findings showed a strong and positive correlation between the dimensions of information technology and organizational performance, as well as a statistically significant impact of the dimensions of information technology on organizational performance at the university.

Olanrewaju (2016) identified the impact of information technology on the performance of Nigerian banks. The findings concluded the impact of the use of information technology on the organizational performance of banks, employee satisfaction, and increased profits. Haykal (2015) indicated that the level of use of information technology and performance of Al-Amal Company was good. Moreover, information technology impacts company performance, which means that the increased

interest in information technology will raise the level of company performance. Eruemegbe (2015) revealed a positive impact of the use of ICT on the development of the performance of institutions in the banking sector. It showed that the use of ICT increased the effectiveness and efficiency of banks, increased their competitive advantage, and achieved an increase in profits.

These studies demonstrate the increasing importance of information technology in enhancing institutional performance across a wide range of sectors. Notably, researchers have a consensus on the positive role that information technology plays in improving efficiency and effectiveness in institutional performance, with some minor differences depending on the nature of the sector or organizational environment. These findings underscore the need for tailored strategies to implement information technology in alignment with the specific characteristics of each sector to enhance strategic and institutional performance.

This study focuses on linking information technology to strategic performance, specifically within the context of Yemeni telecommunications companies. In addition, it aimed to investigate the impact of information technology dimensions (hardware, software, databases, communication networks, personnel skills) on the strategic performance of Yemeni telecommunications companies and to determine the general level of information technology and strategic performance in those companies.

This study aimed to investigate the impact of information technology on the strategic performance in Yemeni telecommunications companies, and to determine the level of information technology; strategic performance; and the impact of information technology dimensions (hardware, software, databases, communication networks, personnel skills) on strategic performance in that companies.

2. METHOD

A descriptive analytical approach was followed in the current study because it is the most common approach used in the social and administrative sciences. It helps to understand the phenomenon theoretically through secondary data and study, analyze, and describe the characteristics of the phenomenon as it actually is by conducting the field study and collecting data without bias during analysis and description (Al-Ariqi, 2020). Therefore, it is appropriate to the present study's nature and objectives.

The study population included five Yemeni telecommunications companies (Yemen Mobile, Sabafon, YOU, Y, and TeleYemen), with a total of 2,238 employees. The study sample was selected from the whole population whose job titles were executive general managers, executive deputy general managers, department managers, heads of department, supervisors, and specialists because of the nature of their work and their practice of information technology as officials, supervisors, and specialists in the performance of various activities in their companies.

Due to the difference in the number of individuals in each layer of the study population, the study used the non-proportional stratified random sample method to select the sample members. Therefore, the sample size, according to the Richard Geiger equation, was 328 individuals, which represented the minimum acceptable sample. According to Kennard and Taylor (1983), increasing the size of the study sample contributes to obtaining accurate and generalizable results (Ismail, 2016). In order to obtain accurate and generalizable results, the sample size was increased to 560 individuals. Therefore, 560 questionnaire forms were distributed to the study sample, but 515 forms were received, 479 of which were valid for analysis, representing 85.53% of the distributed questionnaires.

Figure 1 shows the cognitive model of this study. The independent variable includes information technology in its dimensions: hardware, software, databases, communication networks, personnel skills. The dependent variable includes strategic performance in its dimensions: financial dimension, customers dimension, internal operations dimension, and learning and growth dimension.

The study used the questionnaire as a main tool for field data collection because it is the most appropriate tool to achieve the study objectives. The questionnaire consisted of a set of themes (study

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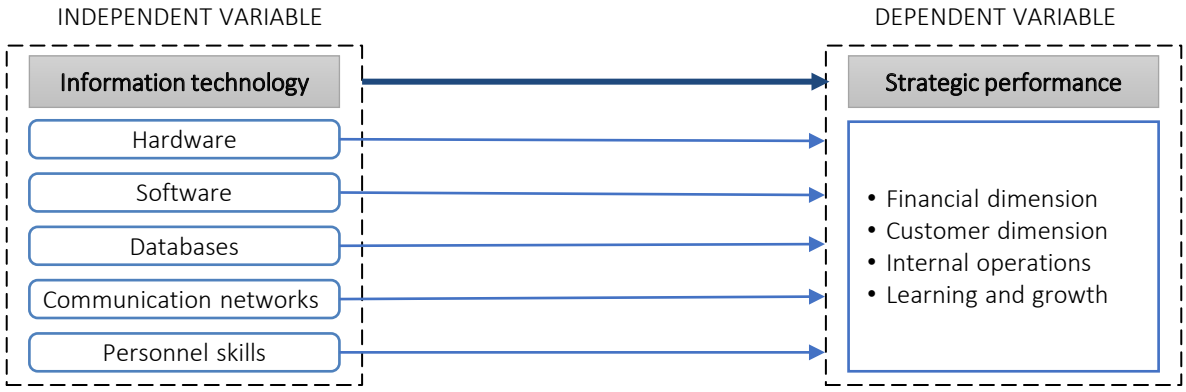

Figure 1. Conceptual framework

variables and dimensions) that reflect the philosophy of the study questions and objectives. The seven-point Likert scale was used to answer the questionnaire items. Table 1 shows the levels, scores, weighted average range, and relative weights of the seven-point Likert scale answers.

In order to ensure the obvious validity of the study tool, it was presented in its initial form to 16 academics in the relevant disciplines. They reviewed it and expressed their views on the validity and appropriateness of the questionnaire items and themes in terms of their structure, clarity, and relativeness, and the theme's compatibility with the study questions, objectives, and hypotheses. The experts modified and rearranged some items and added, deleted, merged, and separated others. Appendix A shows the questionnaire in its final form.

Cronbach's alpha coefficient was used to test the reliability of the study instrument, and Pearson‹s correlation coefficient to test the validity of the internal consistency of the questionnaire.

From Table 2, it is clear that the dimensions of the study show high reliability, as Cronbach's

Table 1. Levels, scores, weighted average range, and relative weights of the seven-point Likert scale answers

Opinion	Score	Weighted average range	Relative weight	Verbal appreciation
Strongly disagree	1	1 to 1.86	14.3% to 26.6%	Too low
Disagree	2	1.86 to 2.71	26.6% to 38.8%	Low
Somewhat Disagree	3	2.71 to 3.57	38.8% to 51%	Fairly low
Neutral	4	3.57 to 4.43	51% to 63.2%	Average
Somewhat Agree	5	4.43 to 5.29	63.2% to 75.5%	Fairly High.
Agree	6	5.29 to 6.14	75.5% to 87.7%	High
Strongly agree	7	6.14 to 7	87.7 to 100%	Very high

Table 2. Cronbach's alpha and Pearson correlation coefficients

Study Variables	Dimensions	Number of items	Cronbach's Alpha	Pearson correlation coefficient
Information Technology (Independent variable)	Hardware	5	0.878	0.807**
	Software	6	0.897	0.891**
	Databases	5	0.892	0.823**
	Communication networks	5	0.852	0.793**
	Personnel skills	5	0.813	0.804**
Strategic performance (Dependent variable)	Financial dimension	7	0.881	0.811**
	Customer dimension	7	0.880	0.862**
	Internal processes dimension	6	0.870	0.839**
	Learning and growth dimension	6	0.857	0.863**

Note: * * Statistically significant at level (a < 0.001).

alpha values exceeded 0.700 and were high in each dimension of information technology and strategic performance, which ranged between 0.813 and 0.897. This indicates a high degree of reliability and validity of the study tool (questionnaire).

A high consistency in the questionnaire items indicates strong applicability to similar samples, with results similar to those observed and expected in this study. Furthermore, the results suggest a strong relationship between variables and their particular dimensions. Table 2 also shows a high correlation in all dimensions of information technology and strategic performance, which range between 0.891 and 0.793, a statistical function at a significance level less than 0.05. This indicates that all dimensions of each variable are related to each other, are related to the total degree of its variable, have a high degree of validity and internal consistency, and nac measure what they are designed to measure.

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) program. Several statistical methods, such as means and standard deviations, were used to describe the study variables, and multiple regression was used to test the impact of IT dimensions on strategic performance.

3. RESULTS

A descriptive analysis was conducted to describe the opinions of the study sample to determine the level of the independent variable (information technology) and the level of the dependent variable (strategic performance) in Yemeni telecommunications companies. The results are presented in Tables 3 and 4.

Table 3 shows that the means of the dimensions of information technology ranged between 5.83 and 6.10 and the relative importance between 83.4% and 87.2%. The hardware dimension ranked first with a mean of 6.10, standard deviation of 0.883, and relative importance of 87.2%, followed by the software dimension as the second rank (mean = 6.03, standard deviation = 0.840, and relative importance = 86.3%). The communication networks dimension got the third rank with a mean of 6.04, standard deviation of 0.839, and relative importance of 85.9%. The personnel skills dimension got the fourth rank (mean = 5.93, standard deviation = 0.849, and relative importance = 84.8%). Finally, the databases dimension got the fifth rank (mean = 5.83, standard deviation = 0.978, and relative importance = 83.4%). In general, the total mean of all dimensions of the independent IT variable (5.98), standard deviation (0.724), and relative importance (85.5%) indicate that the approval of all dimensions of the study individuals was high.

Table 4 shows the level of strategic performance in Yemeni telecommunications companies. The means of the dimensions of this variable ranged between 5.58 and 5.75, and the relative importance between 79.8% and 82.2%. The customer dimension got the first rank with a mean of 5.75, standard deviation of 0.901, and relative importance of 82.2%. The internal operations dimension was on the second rank with a mean of 5.65, standard deviation of 0.968, and relative importance of 80.8%. The financial dimension got the third rank (mean = 5.65, standard deviation = 1.067, and relative importance = 80.8%). However, the learning and growth dimension got the fourth and last rank (mean = 5.58, standard deviation = 1.023, and relative importance = 79.8%). In general, the total mean of all stra-

Table 3. Descriptive analysis of the level of information technology in Yemeni telecommunications companies

	Dimension	Mean	Standard Deviation	Relative importance	Verbal appreciation	Order
1	Hardware	6.107	0.883	87.2%	High	1
2	Software	6.039	0.840	86.3%	High	2
3	Databases	5.838	0.978	83.4%	High	5
4	Communication networks	6.014	0.839	85.9%	High	3
5	Personnel skills	5.934	0.849	84.8%	High	4
	Information technology	5.988	0.724	85.5%	High	

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Table 4. Descriptive analysis of the level of strategic performance in Yemeni telecommunications companies

	Dimension	Mean	Standard Deviation	Relative importance	Verbal appreciation	Order
1	Financial dimension	5.658	1.067	80.8%	High	3
2	Customer dimension	5.751	0.901	82.2%	High	1
3	Internal operation dimension	5.659	0.968	80.8%	High	2
4	Learning and growth dimension	5.583	1.023	79.8%	High	4
Strategic performance		5.666	0.833	80.9%	High	

Table 5. Multiple linear regression analysis

Correlation coefficient R	Coefficient of determination R^2	Corrected determination coefficient (R^2)	Value F	Degrees of freedom Df	Sig	Dimension	Beta	T-value	P-value	VIF
0.625	0.39	0.385	60.76	5 473	.000	Hardware	0.212	3.985	.000	2.208
						Software	0.043	–.673	.502	3.202
						Databases	0.205	3.891	.000	2.151
						Communication networks	0.033	0.648	.517	2.025
						Personnel Skills	0.340	6.560	.000	2.083

tegic performance dimensions representing the dependent variable was 5.66, standard deviation was 0.833, and relative importance was 80.9%. This indicates that the study sample agreement on all dimensions of this variable was high.

After ensuring the data are normally distributed because there is no linear overlap between the independent variables, the multiple linear regression analysis test was performed.

It is obvious from Table 5 that the value of the correlation coefficient *R* was 0.625 at a level of significance less than 0.05. This indicates a strong positive relationship between the dimensions of information technology (hardware, software, databases, communication networks, and personnel skills) and strategic performance. The value of the corrected determination coefficient R^2 (0.385) indicated that the dimensions of the independent variable explain 38.5% of the variation in strategic performance. In other words, the change in strategic performance results from the change in the dimensions of information technology by 38.5%.

The *F* value (60.764) at degrees of freedom (5, 473) is statistically significant at a significance level of less than 0.05. The relationship between the dimensions of information technology (hardware, software, databases, communication networks, and personnel skills) and the strategic performance was confirmed. Accordingly, the impact of information technology on strategic performance was tested at each level.

There was a statistically significant positive impact of the hardware dimension on strategic performance, as the value of *T* was 3.985, which is statistically significant at a significance level of less than 0.05, and the value of Beta was 0.212. This indicates that the dimension of hardware can improve strategic performance, assuming the neutralization of other variables. The increase in hardware by one degree will increase strategic performance by 21.2%.

There is no statistically significant impact of the software dimension on strategic performance, as the value of Beta for this dimension was –0.043, the value of *T* was –0.673, and the level of significance was 0.502, which is greater than 0.05.

There is a statistically significant positive impact of the database dimension on strategic performance, as the value of *T* was 3.891, the *P* value was 0.000, which is statistically significant at a level of less than 0.05, and the value of Beta was 0.205. This indicates that databases can improve strategic performance, assuming the neutralization of other variables. The increase in the database dimension by one degree will increase strategic performance by 20.5%.

The dimension of communication networks has no statistically significant effect on strategic performance, as the value of Beta for this dimension was 0.033, the value of *T* was 0.648, and the level of significance was 0.517, which is greater than 0.05; therefore, it is not statistically significant.

There is a statistically significant positive impact of the personnel skills dimension on strategic performance, as the value of *T* was 6.560 and the *P* value was 0.000, which is statistically significant at a level of less than 0.05, and the value of Beta reached 0.340. This indicates that the skills of individuals can improve strategic performance, assuming the neutralization of other variables. The increase in the dimension of individual skills by one degree will increase strategic performance by 34%, which is the most influential dimension of information technology.

4. DISCUSSION

Yemeni telecommunications companies have a high interest in information technology in all its dimensions due to the nature of their work, as their use and application of information technology in all its dimensions are at a high level. However, the attention is still below the necessary level and requires greater efforts to increase. It also requires the leadership of telecommunications companies to pay great attention to the dimension of databases and personnel skills because it is considered one of the most important dimensions in information technology. This result is consistent with Bouchachi (2020), who reached a high and good level in information and communication technology in the Algiers-Bourguilla Telecommunications Corporation. This differs from the study of Al-Bashabsha (2029), which found that electronic management in Jordanian telecommunications companies has reached a medium level.

Yemeni telecommunications companies are highly interested in strategic performance in all its dimensions. This indicates that the study sample promotes strategic performance and sees its importance in the overall achievement of the goals of telecommunications companies. In conclusion, the study sample perceived the high importance fothe customer dimension, the dimension of internal operations, and the financial dimension. However, there is a need to improve the learning and growth dimension to further enhance strategic performance. This result is consistent with Bouchachi (2020), who reached a high and good level of strategic performance in the Algiers-Bourguilla Telecommunications Corporation. Tirtayasa and Imaroh (2021) found that the level of performance of the company PT, Inti Nusa Permata, was excellent in the dimensions of customers, internal operations, learning, and growth, but it is different in the financial dimension, which came at a weak level.

In contrast, the study disagrees with Almarhdi and Sagher (2023), who reached a rather high level of strategic performance in Yemeni telecommunications companies. Al-Bashabsha (2019) found that the level of organization performance is average in Jordanian telecommunications companies.

There is a statistically significant positive impact of information technology in its combined dimensions on the strategic performance of Yemeni telecommunications companies, and this is an indication that information technology plays a significant role in raising the level of strategic performance in those companies. These results are consistent with Bouchachi (2020), who found that information technology has a positive impact on the organizational performance of Algiers Telecom. Haykal (2015) demonstrated that the use of information technology positively affects performance improvement according to the dimensions of customer satisfaction, internal processes, learning, and growth. The results also agree with the findings of both Talabani (2017) and Fanni (2018). They found that information technology positively affects the improvement of institutional performance. Moreover, Eruemegbe (2015) discovered that information technology positively affects the development of institutional performance. Olanrewaju (2016) showed the impact of the use of information technology on the bank organizational performance in its dimensions of customer satisfaction and increased profits.

The current study found no independent impact of the software and communication network dimensions on strategic performance. This find-

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ing is different from the study of Talabani (2017), which found statistically significant relationships between all dimensions of information technology and organizational performance. It also contradicts Fanni (2018), who described a clear positive impact of the uses of modern information and communication technologies in all their dimensions in raising the level of performance in the studied banks. These variations in the results may be due to the different nature of the study sample in telecommunications companies. Previous studies mainly focused on banks, universities, and other organizations. In addition, one should mention the difference between the Yemeni environment and the environment in which other previous studies were conducted. Finally, IT dimensions may affect in an integrated rather than independent manner.

Future studies can examine the impact of information technology on strategic performance in Yemeni commercial other than telecommunications companies. Further studies could investigate the impact of knowledge management on strategic performance in commercial companies in general and telecommunications companies in particular.

CONCLUSION

This study aimed to investigate the level of information technology and strategic performance and to determine the effects of information technology dimensions (hardware, software, databases, communication networks, and personnel skills) on the strategic performance of Yemeni telecommunications companies.

The results indicated that the overall usage of information technology was high, with hardware ranked first, followed by software, communication networks, personnel skills, and lastly, databases, which remain below the required level despite their importance. Strategic performance was also at a high level, with the customer dimension ranked highest, followed by operations, financial, and then learning and growth, with a need to enhance creativity and innovation.

The study results demonstrated a statistically significant impact of information technology on the strategic performance of Yemeni telecommunications companies, indicating its critical role in enhancing performance levels. Specifically, the dimensions of hardware, databases, and personnel skills showed significant individual impacts on strategic performance, underscoring their importance in elevating company outcomes. In contrast, software and communication networks did not exhibit significant individual impacts, suggesting a need for integrated use of all information technology components to optimize strategic performance effectively.

The study recommends paying attention to the modernization and development of utilized information technology in Yemeni telecommunications companies and increasing investment in them. It also recommends improving databases and developing personnel skills to improve and raise the level of strategic performance.

AUTHOR CONTRIBUTIONS

Conceptualization: Isam Ali Ahmed Al-Hamli.
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APPENDIX A. QUESTIONNAIRE

Section One: Demographic and job information

Please place a (√) inside the box corresponding to the answer that applies to your situation.

1. Gender:
- ☐ Male
- ☐ Female

2. Age:
- ☐ Less than 30 years
- ☐ From 30 to less than 40 years
- ☐ From 40 to less than 50 years
- ☐ 50 years and above

3. Educational qualification:
- ☐ High school or less
- ☐ Diploma after high school
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Ph.D.

4. Job title:
- ☐ Specialist
- ☐ Supervisor
- ☐ Section Head
- ☐ Department Manager
- ☐ Deputy Executive Manager
- ☐ Executive Manager

5. Years of service in the telecommunications sector:
- ☐ Less than 5 years
- ☐ From 5 to less than 10 years
- ☐ From 10 to less than 15 years
- ☐ 15 years and above

6. Company you work for:
- ☐ Yemen Mobile
- ☐ Sabafon
- ☐ United Yemeni-Omani (you)
- ☐ Y
- ☐ Telyemen

Section Two: Key variables

Please answer the following statements by placing a (√) in the box that best reflects your opinion.

Part One: Measuring the level of information technology usage in the company

Information technology refers to an integrated system of computers, equipment, software, databases, communication networks, and technical skills used in a company to collect, organize, process, store, and exchange data between departments, divisions, and relevant parties.

No.	Statements	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
	Dimension One: Hardware (Devices and equipment)							
1	The company has a sufficient number of computers and appropriate devices for work.							
2	The company ensures the continuous updating of its IT computers and devices.							
3	The computers in the company provide fast and accurate data processing.							
4	The computers in the company have high storage capacity.							
5	The company ensures that specifications for IT computers and devices are met when purchasing them.							
	Dimension Two: Software (Programs and systems)							
6	The company uses modern computer systems and software in its operations.							
7	The company continuously develops and updates its software according to work requirements.							
8	The company provides advanced security systems to protect data and software used in work.							
9	The software and systems used in the company are efficient.							
10	The software and systems used in the company are easy to use.							
11	The software and systems used in the company provide updated information.							
	Dimension Three: Databases							
12	The company has integrated databases linked with all programs and applications.							
13	The company's databases contain accurate data and information.							
14	The company ensures the continuous updating of its databases.							
15	The company's databases respond quickly to user requests.							
16	The databases used in the company provide appropriate information for decision-making in a timely manner.							
	Dimension Four: Communication networks							
17	The company uses modern internal communication networks that connect its various departments.							
18	The company uses communication networks that connect it with its branches and agents.							
19	The communication networks used in the company facilitate and speed up the exchange of information.							
20	The company provides modern security and protection systems for communication networks to maintain the confidentiality of information.							
21	The company conducts regular maintenance for all communication networks.							
	Dimension Five: Personnel skills							
22	Employees in the company possess the necessary skills to use computers and software.							
23	The company provides sufficient training for its employees on using computers and software.							
24	The company has qualified specialists to develop and update systems and software according to work requirements.							
25	The company has a specialized team that maintains IT devices and equipment.							
26	Employees have appropriate access rights to systems according to their responsibilities.							

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Part Two: Measuring the level of strategic performance in the company

Strategic performance refers to the overall performance of a company represented in the final results achieved from the interaction of the company's activities and resources through the optimal use of resources to achieve the company's goals.

No.	Statements	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
	Dimension One: Financial dimension							
1	The company distributes annual profits to shareholders.							
2	The company conducts promotional campaigns to increase sales.							
3	The company implements service diversification policies to increase revenue.							
4	The company's profit rate increases annually.							
5	The return rate on services significantly exceeds the cost of the service.							
6	The company's net income is constantly increasing.							
7	The company's market value is continuously increasing.							
	Dimension Two: Customer dimension							
8	The company conducts customer surveys about the services provided electronically.							
9	The company focuses on quickly addressing customer complaints.							
10	The company designs its services and offers based on anticipated customer needs.							
11	The company's customers can easily access its offers and services.							
12	The company continually works to improve the quality of its services.							
13	The company offers more diverse packages than its competitors.							
14	The company works on retaining and increasing its customer base.							
	Dimension Three: Internal operations dimension							
15	The company works on improving and developing its internal processes to meet the beneficiaries' needs.							
16	The information system in the company provides the necessary information for decision-making at the right time.							
17	The company ensures the optimal use of its available resources.							
18	The tasks required from the company's employees are completed on time.							
19	The tasks required from the company's employees are completed with the required accuracy.							
20	Business practices within the company are characterized by flexibility.							
	Dimension Four: Learning and growth dimension							
21	The company continually develops its work methods with modern techniques.							
22	The company works on expanding its services by increasing coverage across different regions of the country.							
23	The company works on developing the skills and abilities of its employees through continuous training.							
24	The company constantly supports creative ideas and research and development efforts.							
25	The company continuously encourages creative and distinguished employees.							
26	The company has the ability to adapt to changes in the surrounding environment.							