

# **Strengthening Organizational Performance Through Information Technology Best Practices A Reflection on Governmental Organizations in Iraq**

**By**

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## **Abstract**

The study examines the effect of implementing information technology practices in governmental organizations and its impact on enhancing organizational performance. Governmental organizations relying on cutting-edge, contemporary technology have perceived higher efficiency in productivity and performance. Collected data were processed with SPSS and the Amos program to validate the model's goodness of fit. The study confirmed that information technology dimensions cause high variations in organizational performance. Information technology dimensions were classified in order of importance. Communication networks were ranked first, followed by human resource management practices. Innovative software was rated in the third rank, training in information technology and modern hardware took fourth place, while modern hardware was ranked last. A unit variation in information technology enhances organizational performance. It is recommended to structure a long-term quality approach associating information technology and organizational performance. A committee composed of senior managers should monitor the application of information technology strategies.

**Keywords:** Organizational Performance, Innovative Software, Information Technology Practices, Modern Hardware and Devices, Communication Networks, Training, Human Resources.

## **1. Introduction**

Worldwide technological development has influenced organizational performance. Advanced technological industries have perceived necessary alterations embracing innovation, development, and flexibility in production (Shilenge and Telukdarie, 2021). Technological change comprises modern methods to transform raw materials from data and information into ready and accurate products. Technological change has introduced innovative technologies that reduce production costs, raise productivity, and improve quality and workflow (Mansour *et al.*, 2021). These technological changes eased and restored management procedures of various

departments at multiple levels. Moreover, organizations have assembled their management strategies based on information technology (Kaur and Narula, 2019).

The acceleration in technological development goes hand in hand with the increase in the need for the speedy delivery and the desire of citizens to obtain sophisticated services following standardized methods (Ambekar, Deshmukh, and Hudnurkar, 2021). However, the failure of the traditional administration systems to respond to those desires amplified the need to reconsider the systems and methods of service management. Hence, implementing efficient information technology increases corporate interest in using modern hardware and devices, innovative software, communication networks, Training on information technology systems, and human resource management practices due to its productive functions. The benefits of using information technology and its sources are numerous (Przychodzen, Gómez-Bezares and Przychodzen, 2018; Alomari, 2022; Muango, Abrokwah and Shaojian, 2021). Nevertheless, adopting information technology ensures a competitive edge, leverages organizational effectiveness, and contributes to its success.

### ***1.1. Problem statement***

In this era characterized by accelerated knowledge and technology and increased competition, implementing information technology is obligatory for organizational success. This success requires the implementation of technological changes in the entire organization. Therefore, keeping abreast of recent progress in information technology is imperative to respond to compulsory changes (Hu *et al.*, 2016; Tarigan, Jiputra and Siagian, 2021). However, governmental organizations lag in implementing and using information technology. A lack of buy-in from the decision-makers represents a decisive obstacle. An efficient implementation of information technology is an urgent stipulation to improve performance and increase productivity. Information technology, a modern innovation in management, is a vital input strategy and tool for managing changes (de Vaujany *et al.*, 2018). In contemporary organizations, information technology transforms traditional working patterns into rational, intellectual patterns and practices. The latter should be compatible with the era of innovative and accelerated technological expansions (Zhou *et al.*, 2021).

Obstacles facing the implementation of efficient information technology increased the deterioration of organizational performance (Agyabeng-Mensah, Ahenkorah and Osei, 2019). Governmental organizations in Iraq suffer from technical problems, including frail information and communication technology practices. These practical problems are manifested especially at the House of Representatives departmental level. Traditional and routine working method prevails in this public organization. Employees lack creativity and innovation due to the absence of information technology (Tortorella *et al.*, 2021; Weeks and Namusonge, 2016). Consequently, organizations straggling with the development and implantation of information technology tools will observe a drop in their organizational performance. These predicted obstacles escalate the research core question: “What is the impact of implemented centralized information technology practices on governmental organizational performance in Iraq?”

### ***1.2. Research Questions***

Additional sub-questions heighten:

- What are the significant dimensions constituting information technology affecting organizational performance?
- Where does the implementation of information technology exhibit the highest efficiency?

- How and to which extent does this information technology influence organizational performance?

### ***1.3. The Aim and Objectives of The Study***

This paper aims to confirm the implication of using information technology to enhance organizational performance. Hence, this paper seeks to accomplish four objectives:

1. To present a systematic understanding of the effective use and the benefits of applying information technology in governmental organizations.
2. To investigate essential dimensions constituting information technology
3. To validate a fit model examining practices of information technology influencing organizational performance.
4. To provide recommendations to persuade executives to “buy-out” consequently leveraging the implementation of information technology practices.

### ***1.4. The Significance of The Study***

This study underlines organizational changes due to the implementation of information technology. It highlights the need for governmental organizations and keeps pace with high-tech vicissitudes to advance the efficiency of organizational performance. This study can be differentiated from previous publications since it embodies an aspiration for the Iraqi House of Representatives to adopt and apply novel information systems. This study is one of the few studies in Iraq. It identifies the extent of technology information in the House of Representatives as a case study. It is an exemplified ambition to develop and improve the continuity of human resources functions. The application of information technology helps enhance work organization by reaching higher accuracy, internal work regulation, and attaining its mission and vision.

Information technology develops the performance of administrative units, improves documentation processes, and eliminates routine tasks in administrative procedures. Projected results denote the need to launch an integrated electronic communication system linking the central human resources department with regional and rural offices (Uysal and Çetinkaya, 2021). Setting up a centralized system unifying input from all departments will help governments to economize time and effort, safeguard data, reduce data spoilage and loss, and ease access to secure information (Fajarini *et al.*, 2021; Jones *et al.*, 2018).

This paper is structured in five sections. Section one has presented the guideline embracing the objectives and research questions and stated the problem. The current state of literature concerning information technology is highlighted in section two. The latter underlines the payback of implementing information technology. The research methodology is presented in section three. The questionnaire results and their interpretation are established in section four. Finally, the conclusion and recommendations are initiated in the last section.

## **2. The Literature Review**

Information technology seeks to update information for decision-making to advance organizational performance. Currently, information technology is spread on international levels. This worldwide spread is the logical consequence of superior improvements in organizational infrastructure (Sánchez Limón and De la Garza Cárdenas, 2018). Therefore, notably among SMEs, information technology is considered a mission to attain outstanding financial performance.

## **2.1. Information Technology Briefed**

Information technology is founded on the capacity to increase productivity, save costs, and enhance decision-making. It amplifies the relationship between individuals and catalyzes factors in organizational structure to increase organizational performance. Consequently, incorporating innovation in governmental organizations improves performance (Murigi and Kimutai, 2019).

Ye, Zhou and Wu (2020) concluded that the combination of communications and different categories of information technology has led to a relative increase in production. Marchiori *et al.* (2022) established a positive association between information and communication technology. The combination of those two factors accomplishes a competitive advantage in projects. Alkatheeri *et al.* (2021) added that a statistically significant correlation exists between innovative information technology practices and small and medium enterprises managing SMEs. A significant positive statistical association correlates the adoption of information technology with production and job creation efficiency. Darmasaputra Leksono, Siagian and Josowanto Oei (2020); Abubakar and Sinclair, (2018) studied the application of information technology, namely advancing Training on modern hardware and devices and innovative software. Studied hypotheses confirmed that information technology significantly enhances organizational performance (Aini and Subriadi, 2021; Khan, Zhang, and Salik, 2020). However, this influence and relationship vary according to organizational characteristics, explicitly the organization structure, size, and culture. Consequently, the literature review investigation deduced five essential dimensions constituting information technology information.

### **2.1.1. Modern hardware and Devices**

With the evolution of technology, electrical and electronic devices have changed work procedures. Hardware and devices are tangible apparatuses that allow real access to information, processing, and obtaining output. A significant form of innovation is embodied in modern POS systems (Damaj *et al.*, 2022). A point-of-sale system is a tool that any organization cannot lack, regardless of the type of business or size of this organization. A collection of equipment to optimize sales includes up-to-date, modern hardware and devices. However, this does not mean the traditional POS has lost functionality (Patel *et al.*, 2021).

Nevertheless, it has been modernized as information technologies advance. The benefits of equipping organizations with modern hardware and software are countless. These benefits ease sales procedures, optimize purchasing processes and facilitate corporate transactions (Farmansyah and Isnalita, 2020).

### **2.1.2. Innovative Software**

Innovative software is computer systems and programs prepared and manufactured by programmers. Software is the language in which the user communicates with the device. Innovative software alleviates inventory management following an electronic labeling system. The software reduces mistakes and diminishes losses (Larin *et al.*, 2019). Modernization of software fosters a process of continuous innovation by stimulating employee motivation. In other words, software innovation as a function of information technology creates a culture of innovation and provides analytics-based insights. Besides, online platforms as software give each team member a privileged place. All collaborators can propose an idea or a solution on the platform (Hong, Liu and Guo, 2020).

### **2.1.3. Communication Networks**

The need for a participatory innovation platform is well-established as information technology has obsolete the old suggestion boxes. At a time of digital transformation projects, it is, above all, a collaborative platform accessible online that brings together in a single environment all the features that allow ideas to come to life and all the different stakeholders to work better together (Jiang, 2022). The signal includes data and information that passes through the communication medium to the receiver, where government or private institutions use advanced communication to speed up the transfer of information at a lower cost and effort (Santoso and Siagian, 2019). The degree of centralization of the communication network influences the circulation of information and its characteristics. On the other hand, a homogeneous network does not award prevalence for selected members over others. Following this communication network, each individual can address another directly (Gao and Zhou, 2019; Debnath et al., 2022).

### **2.1.4. Training in Information Technology Systems**

Employees are trained in hardware and software to get the best results and use communication networks to send signals from the sender to the receiver. This ignorance hinders information technology's evolution (Yudin et al., 2021; P J, A M and Husain, 2019). If corporate Training has been known for a long time, its evolution according to digital revolutions, on the other hand, is much less. Implementing Training in information technology has encountered bureaucratic challenges, including organizational culture and a lack of intellectual skills to implement those systems (Ammann, Walter and El Benni, 2022). Moreover, in the short term, these obstacles make Training a relegated subject in the face of the main activity. Nevertheless, the logistics related to the implementation of Training, which must always be managed manually, increase the time allocated to management and planning (Sukhoruchkina and Progonnyi, 2019).

### **2.1.5. Human Resource Management Practices**

Human resources and innovation are at the heart of information technology tactics. The right equipment makes it easier to train the workforce. Top teams have improved usability to make it easier to onboard new hires. Establishing an environment for skills development and knowledge retention is a positive lever for the organization and employees. It ensures higher competitiveness. Supporting teams with adapted technology adapted to activities contribute to organizational transformation and the workforce's commitment to constant evolution (Lousã, Rodrigues and Pinto, 2020).

## **2.2. Information Technology Paybacks**

Knowledge of information technology, in particular, advanced systems, improve data accuracy. It provides precise solutions to the establishment's internal and external environment needs. Implementing information and communication technology systems provides support and acts as a reference guide to knowledge management procedures (Rumengan *et al.*, 2018). Office systems and artificial intelligence systems rely on their beneficial application. The expanded use of information technology by corporate organizations supports knowledge procedures by enhancing the tangible aspects of the product.

Information technology is a vital facet of organizational strategic planning. Strategic plans embrace information technology to record information, determine its value, and publish it within the organization. The efficiency and effectiveness of information technology applications help to ensure the desired goals. Creativity and task accuracy development are vital paybacks of this type of technology (Sinaga, Anggraeni and Slamet, 2021).

The organization's size, legal structure, and activities significantly influence information technology and its functional dimensions. Online collaboration and remote work advance the organization of the organization's daily operations. This organization adapts contemporary technology systems such as computers and communication networks to ease internal communication to increase productivity. However, these systems should be implemented according to the organization's needs. The customization of technological systems depends on the office mechanism system to perform and complete tasks (Khatri, 2019; Niedfeldt *et al.*, 2021; Stenholm *et al.*, 2019).

It contributes to the concealment of traditional jobs. On the other side, it contributes to the emergence of new jobs requiring high levels of skill and communication, such as database manager, software systems manager, and information systems analyst (Gunasekaran, Subramanian, and Papadopoulos, 2017). In addition, successive developments in information technology contributed to the emergence of new types of organizational structures known as (T-Form), which depend mainly on technology. The T-form of organizations is characterized by a reduced number of administrative units and an expanded scope of supervision. Therefore, information technology develops multi-unit and virtual structures by shifting from bureaucratic to adhocracy structures (Goh and Sigala, 2020).

### **2.3. Organizational Performance**

Performance can be elucidated as a method of scientific activity to reach the desired goal. Performance is evaluated in terms of efficiency and effectiveness. While for employees, job satisfaction, the quality of the work climate, and their working conditions are essential criteria. Organizational performance must improve continuously to adapt to market obligations and contribute to the company's growth (Aina and Atan, 2020; Alhashedi *et al.*, 2021). Performance measurement is fundamental to any organizational system where we want to mark, monitor, and evaluate progress toward objectives. Information technology can be used to achieve the desired goal of this performance and the evaluation processes (Singh *et al.*, 2021). The organizational indicators are correlated with human resources assessing productivity. These indicators are measured based on absenteeism, accident, used or unused production capacity, and margin contribution. The organizational indicators thus identify the margins of progress within the company's departments (Prasiani, Yuesti, and Sudja, 2021).

### **2.4. Information Technology and Organizational Performance**

The adoption of information technology possesses a positive impact on employees' performance and the level of managerial skills. It also affects wages and incentives received. Hence, information technology contributes to increasing employee productivity, especially for those working in high-tech technology (Ringim, Razalli and Hasnan, 2015).

Ali *et al.* (2021); Ako-Nai and Singh (2019) explained that changes in the world of information technology have led to diversity in their work and skill level and wage rates in various jobs. The organization has a relationship between the values of the investments allocated to information technology and workforce skill and education: academic level and vice versa.

The study of Yassine Boussenna and Ouail El Kharraz (2021) has demonstrated significant challenges facing technology users due to major changes in managerial procedures. These changes manifest in their transition to contemporary management from conventional operating systems. Lobler *et al.* (2015) concluded that modern information technology

positively influences technical transformation procedures. This transformation embraces a shift from traditional paperwork to the practice of innovative software as information technology to progress human resources practices. This shift to innovation contributes to simplifying communication processes between departments.

Altındağ and Öngel (2021); Kumar, Singh, and Modgil (2020); (Khan et al. (2021) had contradictory viewpoints. These authors indicated no affiliation between innovative information technology practices and organizational performance. Their study perceived information technology as an accelerator to innovative knowledge management practices. The latter is directly associated with marketing management leading to an increase in financial performance.

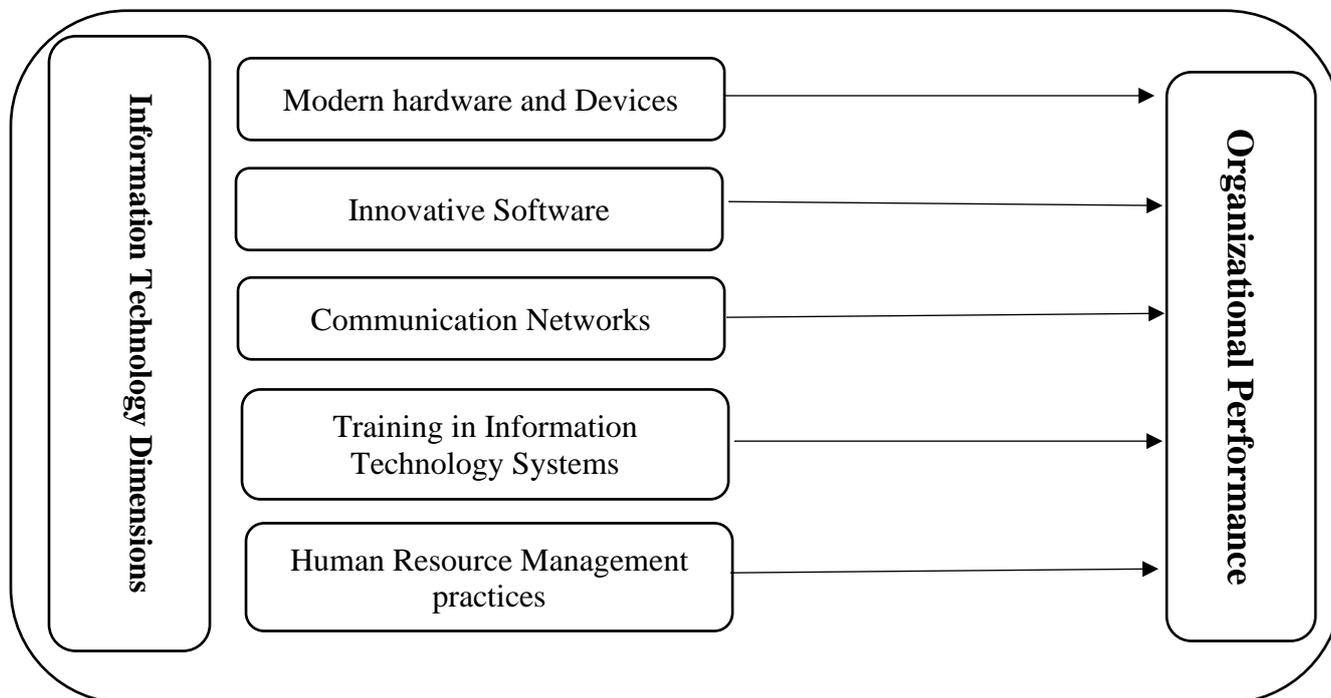
Chege, Wang and Suntu (2020); Alzahrani and Seth (2021) clinched reliable positive empirical outcomes. These outcomes can be summarized in the benefits of implementing information technology in banks. Benefits include increased profitability, accomplishing accurate goals, accelerating work speed, and keeping pace with international technological development. In conclusion, banks are instigating information technology to achieve remarkable organizational performance. Those results align with the study of Kazakov, Ruiz-Alba and Muñoz (2020), reinforcing that the usage of information and communication technology had a good impact on job performance, particularly in governmental organizations in Algeria.

Correa Ospina and Díaz Pinzón (2018) determined that sports institutions are affected by information technology. A study that information technology has a role in improving the performance of the human resources department. Therefore, information technology embracing modern computer devices and equipment (hardware), innovative programs (software), and communication networks increases organizational performance. Accordingly, information technology improves organizational performance and sustainability and eliminates competition. In addition, Sylqa and Neziraj (2022) clarified that enforcing information technology practices in administrative departments is compulsory.

## ***2.5. Research Hypotheses***

- **H1.1 o:** There is no significant statistical relationship between modern hardware and devices and organizational performance.
- **H1.1 a:** There is a significant statistical relationship between modern hardware and devices and organizational performance.
- **H1.2 o:** There is no significant statistical relationship between innovative software and organizational performance.
- **H1.2 a:** There is a significant statistical relationship between innovative software and organizational performance.
- **H1.3 o:** There is no significant statistical relationship between communication networks and organizational performance.
- **H1.3 a:** There is a significant statistical relationship between communication networks and organizational performance.
- **H1.3 o:** There is no significant statistical relationship between Training in information technology systems and organizational performance.

- **H1.3 a:** There is a significant statistical relationship between Training in information technology systems and organizational performance.
- **H1.3 o:** There is no significant statistical relationship between human resource management practices and organizational performance.
- **H1.3 a:** There is a significant statistical relationship between human resource management practices and organizational performance.



**Figure 1:** *Conceptual Framework (Akram et al., 2018; Sukati, Sanyal and Ba Awaain, 2020; Hung et al., 2018)*

### **3. Research Methodology**

#### **3.1. The Research Philosophy**

The general research objective focus on identifying improvement methods for the performance of Iraqi governmental organizations. in particular, this research identifies the relationship between organizational performance and five antecedents of information technology. It aims to verify the goodness of fit by linking innovative factors of information technology with organizational productivity. Consequently, this research adopts the positivism philosophy. It confirms the relationship between the research topic, the objectives, and the questions. The use of this philosophy is verified by extensive literature associating those variables. Theoretical pieces of evidence associating chosen variables are derived exclusively from observation and experimentation and analyzed from a neutral and objective point of view.

#### **3.2. The Research Design And Approach**

This research presents all the characteristics of a correlational/descriptive study. It deals with studying the relationships between two sets of variables without the researcher intervening actively to influence these variables. The characteristics of the relationships between variables categorize this study as descriptive and explanatory.

This study is described as “hypothetico-deductive” because it seeks to empirically verify accepted and recognized theoretical models. The hypothetico-deductive focuses on the empirical ground to validate or invalidate one central hypothesis and five sub-hypotheses. This approach studies the effects of modern hardware and devices, innovative software, communication networks, Training on information technology systems, and human resource management practices as indicators defined in the literature review.

### 3.3. *The Quantitative Methods and The Questionnaire*

The quantitative study assesses the various dimensions addressed in the questionnaire. It is agreed that Iraqi governmental organizations are relevant and appropriate within the framework. In particular, the questionnaire was intended for the House of Representatives.

The questionnaire as a measuring instrument includes 18 questions. The choice of the questionnaire as a data collection tool was essential to obtain data on many aspects of a large population. It is also easy to compare results since the multiple-choice questions evaluated on the five points of the Likert scale ease the quantification of results. The quantitative study obtains measurable data leading to statistical procedures. Therefore, the study of relationships verifies the model goodness of fit between variables. The questionnaire is made up of six main sections that relate to the concepts covered in the study. The questionnaire sections are summarized in table (1).

**Table 1:** *Sections and Items of the Questionnaire*

	<b>Dimensions</b>	<b>Items forming the scale</b>	<b>Symbols of items names</b>
<b>Information Technology Dimensions</b>	Modern hardware and Devices	5	MHD1 → MHD5
	Innovative Software	8	IS1 → IS8
	Communication Networks	6	CN1 → CN6
	Training in information technology systems	7	TIT1 → TIT7
	Human resource management practices	10	HRP1 → HRP10
	<b>Organizational Performance</b>	11	OP1 → HRP 11

### 3.4. *Data Collection Procedures*

Given the size of the study population, a pretest was performed to check the questionnaire’s validity. Data collection was done after the execution of both content and face validity. Professors from the Jinan university took part in the proofreading test for the Arabic and English versions of the questionnaire to detect errors and ambiguities. The questionnaire was sent by e-mail to employees. The sampling method is non-probability because it is difficult in research to select sampling units randomly. In particular, convenience sampling was used to reach the selected units, that is, employees available and accessible to participate in the research.

### 3.5. *Analysis of Survey Data*

The analytical methods chosen to verify the research hypotheses are essentially quantitative. Cronbach alpha and KMO analysis procedures are adopted to verify the validity and reliability of the questionnaire. The latter is a crucial part of the PCA, principal factor analysis, to improve the construction of research constructs. The multiple linear regression (stepwise analysis) served as a statistical instrument to classify the retained dimensions of information technology and detect the influence of those dimensions on organizational

performance. The structural equation and path analysis were performed in Amos to validate the model's goodness of fit.

## 4. Analysis Results

Results of the statistical analyzes are presented to answer the stated question. More precisely, the results are analyzed using SPSS and AMOS to verify/reject hypotheses formulated in the theoretical part.

### 4.1. Reliability and Validity

The reliability and validity are revealed using the coefficient of KMO and Cronbach's alpha. Values must be (above) and then (0.50) to verify internal consistency. Table (1) shows values of alpha Cronbach and KMO after the PCA principal factor analysis.

**Table 2: Reliability and Validity (SPSS, 2022)**

Variables	Dimensions	Items before PCA	Items after PCA	Cronbach's alpha	KMO	Sig.
Information Technology Dimensions	Modern hardware and Devices	5	4	0.920	0.837	0.000
	Innovative Software	8	5	0.902		0.000
	Communication Networks	6	4	0.900		0.000
	Training in information technology systems	7	4	0.895		0.000
	Human resource management practices	10	7	0.888		0.000
Organizational Performance		11	7	0.894	0.868	0.000

Table (1) shows the consistency results using Cronbach's alpha coefficient values, which ranged between (0.875-0.92). KMO (Sample size adequacy test) for the scales is more significant than (0.50). Variables achieved a significance level (0.000) which is undoubtedly less than the significance level (0.05). Variables and dimensions have values greater than (0.60), indicating excellent reliability and internal consistency.

### 4.2. PCA Principal Factor Analysis (EFA)

The objective of principal component analysis (or PCA) is purely descriptive. It involves "exploring" a new set of observations gathered to indicate the highest observed values for each quantitative dimension. PCA summarizes available data by focusing on the total variability carried by each variable in the database. It is, therefore, a compression technique to explore and verify the highest influential factors for the research study. To launch the PCA, it is crucial to check data adequacy based on the Kaiser-Meyer-Olkin (KMO) index. Indexes must be greater than 0.5 for an acceptable fit of the data to a PCA. This index is presented in the table above.

**Table 3: Total Variance Explained (SPSS, 2022)**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.056	32.223	32.223	8.056	32.223	32.223	4.018	16.071	16.071
2	2.919	11.678	43.901	2.919	11.678	43.901	3.649	14.595	30.666
3	2.589	10.355	54.256	2.589	10.355	54.256	3.441	13.764	44.430
4	1.501	6.004	60.260	1.501	6.004	60.260	2.689	10.756	55.186
5	1.273	5.093	65.353	1.273	5.093	65.353	2.542	10.167	65.353

Extraction Method: Principal Component Analysis.

The table above summarizes that the five components (new variables) describe the five variables taken simultaneously. Eigenvalues of the components are the essential data in the total Variance explained. The first component has the highest eigenvalue of 8.056 and takes 32.2% of the total Variance, followed by the second, whose eigenvalue is 2.919 and takes 11.678% of the residual Variance. The cumulative Variance taken by the three components is 54.2%. The cumulative percentage of three components represents more than half of the initial data.

**Table 4: Rotated Component Matrix (SPSS, 2022)**

		Component				
		1	2	3	4	5
<b>Communication Networks</b>	CN2	.838				
	CN3	.741				
	CN4	.720				
	CN5	.623				
<b>Human Resource Management Practices</b>	HRP1		.829			
	HRP2		.776			
	HRP3		.771			
	HRP4		.757			
	HRP8		.741			
	HRP9		.732			
<b>Innovative Software</b>	IS2			.768		
	IS4			.656		
	IS5			.637		
	IS6			.573		
<b>Training On Information Technology Systems</b>	TIT1				.839	
	TIT3				.755	
	TIT5				.676	
	TIT7				.591	
<b>Modern hardware and Devices</b>	MHD1					.823
	MHD2					.695
	MHD3					.452
	MHD5					.450

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

To facilitate reading, the varimax rotation modifies the components to superimpose the axes on sets of representative and correlated factors. The Rotated Component Matrix grants the dimensions for the variables. This table shows that Communication Networks

CN is measured with four retained dimensions, the human resource management practices HRP retained seven components out of 10. The innovative software is assessed with five retained dimensions, Training in information technology systems has only four retained dimensions, and modern hardware and devices are formed from four components. PCA reduces the number of initial items and restores a maximum (optimal) amount of information.

#### 4.3. Multiple Linear Regression (Stepwise)

Regression analysis calculated the estimated relationship between organizational performance as the dependent variable and the dimensions of information technology as independent variables. It modeled the relationship between selected variables and predicted values based on many fit models.

**Table 5: Model Summary (SPSS, 2022)**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.969	.938	.937	.13760
2	.983	.966	.965	.10280
3	.985	.971	.969	.09704
4	.987	.974	.972	.09229
5	.988	.977	.974	.08822

Five fit models are reported in the table above. Those models incorporate variables according to their level of importance. The model summary focuses on the correlation coefficient associating dimensions of information technology and organizational performance. R measures the strength of the relationship. Values of Adj (R<sup>2</sup>) of (0.977) in the fifth model predict that information technology explains (97%) of the total variation that occurs in organizational performance. (The probability F is significant at  $p < 0.05$ ). The regression did not exclude any variable from the projected model because the F value associated with coefficient b reached the significance level. The F value ensured that all the variables introduced contributed to significantly improving the variability explained by the final model.

**Table 6: ANOVA (SPSS, 2022)**

	Model	Sum of Squares	df	Mean Square	F	Sig.
<b>1</b>	Regression	13.827	1	13.827	730.302	<b>.000</b>
	Residual	.909	48	.019		
	Total	14.736	49			
<b>2</b>	Regression	14.239	2	7.120	673.745	<b>.000</b>
	Residual	.497	47	.011		
	Total	14.736	49			
<b>3</b>	Regression	14.303	3	4.768	506.249	<b>.000</b>
	Residual	.433	46	.009		
	Total	14.736	49			
<b>4</b>	Regression	14.353	4	3.588	421.295	<b>.000</b>

	Residual	.383	45	.009		
	Total	14.736	49			
	Regression	14.394	5	2.879	369.898	<b>.000</b>
<b>5</b>	Residual	.342	44	.008		
	Total	14.736	49			

a. Dependent Variable: Organizational Performance

The F-statistic indicates the predictive ability of the regression model and determines whether regression coefficients are higher than 0. The F-test examines the collective influence of the independent variables rather than testing them individually. The F statistic is associated with a p-value. These values determined that the relationships in the five are significantly fit and can rule out null hypotheses. The p-value of 0.000 is less than 0.05.

Therefore, null hypotheses can be rejected according to the value F obtained for the five models. Indeed, the high values of F, for example, 730.302 for the first model and 369.898 for the fifth model 365.38, are significant at  $p < 0.001$ . Those values indicate that we have less than a 0.01% chance of being wrong in asserting that the models contribute to predicting organizational performance.

**Table 7: Coefficients (SPSS, 2022)**

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.320	.130		2.469	<b>.000</b>
	Communication Networks	.905	.033	.969	27.024	<b>.000</b>
2	(Constant)	.404	.151		2.677	<b>.000</b>
	Communication Networks	.920	.025	.985	36.606	<b>.000</b>
	Human resource management practices	.184	.030	.168	6.245	<b>.000</b>
3	(Constant)	.320	.146		2.189	<b>.000</b>
	Communication Networks	.929	.024	.994	38.746	<b>.000</b>
	Human resource management practices	.207	.029	.189	7.090	<b>.000</b>
	Innovative Software	.059	.023	.069	2.596	<b>.000</b>
4	(Constant)	.404	.143		2.818	<b>.000</b>
	Communication Networks	.881	.030	.943	29.289	<b>.000</b>
	Human resource management practices	.208	.028	.189	7.482	<b>.000</b>
	Innovative Software	.104	.028	.123	3.649	<b>.000</b>
	Training in information technology systems	.117	.048	.097	2.421	<b>.000</b>
5	(Constant)	.456	.139		3.285	<b>.000</b>
	<b>Communication Networks</b>	.876	.029	.938	30.341	<b>.000</b>
	<b>Human resource management practices</b>	.601	.027	.483	7.506	<b>.000</b>
	<b>Innovative Software</b>	.515	.028	.436	5.159	<b>.000</b>
	<b>Training in information technology systems</b>	.416	.046	.496	4.518	<b>.000</b>
	<b>Modern hardware and Devices</b>	.244	.019	.256	4.291	<b>.000</b>

a. Dependent Variable: Organizational Performance

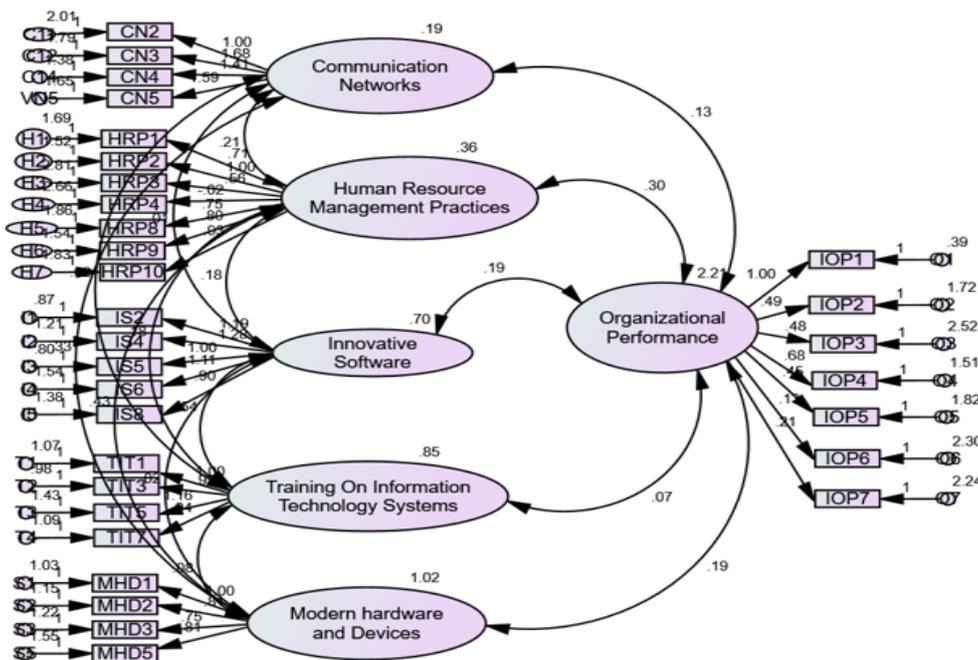
T values are substantial and verify that predicted coefficients are significant. The standardized Beta ( $\beta$ ) value shows the change in the standard deviation of the dependent variable for each standard deviation increase in independent variables when all other values are constant. This table also presents the value of the correlations.

- **Communication Networks and Organizational Performance.** An increase in Communication Networks by (60%,  $B= 0.601$ ) will improve organizational performance by (48%,  $\beta=483$ ). The value of (t) extracted was recorded as (30.341). The value of (F) extracted is undoubtedly more significant than the tabular (F) value of (3.94) with a Significant P less than (0.01). Accordingly, the alternative hypothesis stating: a significant statistical relationship between communication networks and organizational performance is supported.
- **Human resource management practices and Organizational Performance.** The value of (t) extracted was recorded as (7.506). The value of (F) extracted is undoubtedly greater than the tabular (F) value of (3.94) with a Significant P less than (0.01). Accordingly, the alternative hypothesis stating that: There is a significant statistical relationship between human resource management practices and organizational performance is supported. An upgrade in Human resource management practices by (87%,  $B= 0.876$ ) will enhance the organizational performance by (93%,  $\beta=938$ ).
- **Innovative Software and Organizational Performance.** The value of (t) extracted was recorded as (4.159). The value of (F) extracted is higher than the tabular (F) value of (3.94) with a Significant P less than (0.01). Accordingly, the alternative hypothesis stating that: There is a significant statistical relationship between innovative software and organizational performance is supported. An advancement in Innovative Software by (51%,  $B= 0.515$ ) will enhance organizational performance by (53%,  $\beta=536$ ).
- **Training in information technology systems and Organizational Performance.** An increase in Training in information technology systems by (41%,  $B= 0.416$ ) will improve organizational performance by (49%,  $\beta=496$ ). The value of (t) extracted was recorded as (4.518). The value of (F) extracted is higher than the tabular (F) value of (3.94) with a Significant P less than (0.01). Accordingly, the alternative hypothesis states That a significant statistical relationship exists between Training in information technology systems and organizational performance.
- **Modern hardware and Devices and Organizational Performance.** The value of (t) extracted was recorded as (4.291). The value of (F) extracted is higher than the tabular (F) value of (3.94) with a Significant P less than (0.01). Accordingly, the alternative hypothesis stating: There is a significant statistical relationship between modern hardware and devices and organizational performance is supported. An upgrade in Human resource management practices by (24%,  $B= 0.244$ ) will enhance the organizational performance by (25%,  $\beta=256$ ).
- The value of ( $\beta$ ) indicates that an increase in information technology by the amount of one unit will increase organizational performance. Values of Beta help to formulate the following equation.

Predicted variation in organizational performance:  $0.456 X$  (Communication Networks  $X 0.876$ ) + (Human resource management practices  $X .601$ ) + (Innovative Software  $X .515$ ) + (Training in information technology systems  $X 0.416$ ) + (Modern hardware and Devices  $X 0.244$ ).

#### **4.4. Confirmatory Factor Analysis (AMOS)**

The CFA (Confirmatory factor analysis) is an extension of exploratory factor analysis. This CFA Confirmatory factor analysis is highlighted in the path analysis and the structural equation model (SEM). The latter was assessed with the goodness of fit indices to measure the model. The CFA confirms the results in the EFA. The confirmatory factor analysis is appropriate in this case due to the underlying solid basis on which the global model is constructed, given specified criteria for model goodness-of-fit.



**Figure 2:** Confirmed Research Model (CFA with latent variables)

The above figure shows the covariances between variables and confirms the relationship between dimensions of information technology and organizational performance.

**Table 8:** Indices of the Goodness of Fit (AMOS, 2022)

Incremental indices	Results	Normed indices	Absolute indices	Results	Normed indices
<b>RFI</b>	0.931	>0.9	<b>RMSEA</b>	0.001	<0.05
<b>TLI</b>	0.930	>0.9	<b>RMR</b>	0.000	<0.05
<b>NFI</b>	0.928	>0.9	<b>GFI</b>	0.972	>0.9
<b>CFI</b>	0.924	>0.9	<b>AGFI</b>	0.971	>0.9
	X2/ddl				<3.5

The value of the  $\chi^2$  is used to evaluate the null hypothesis. The matrix of correlations represents hypotheses. A significant  $\chi^2$  indicates that the alternative hypotheses are supported and, on the other hand, reject the null hypotheses. The Goodness-of-Fit Index (GFI) is equivalent to  $R^2$  in multiple regression and epitomizes the Variance of the model explicated by the data. GFI is  $0.972 \geq 0.90$ . The (RMSEA) value is  $0.001 \leq 0.5$ . The (RMSR) compares the model to the data from the variables' residuals. Regarding the incremental indices, the NFI, TLI, and CFI (0.928, 0.930, and 0.924) these values reached the threshold of 0.9, which means that the incremental criteria support the acceptance of the proposed theoretical model. All the indices are within international standards and validate the study model. Results confirmed the exploratory analysis. Specifically, the CFA confirmed the results of the PCA and the multiple linear regression supporting the correlation between the latent variables.

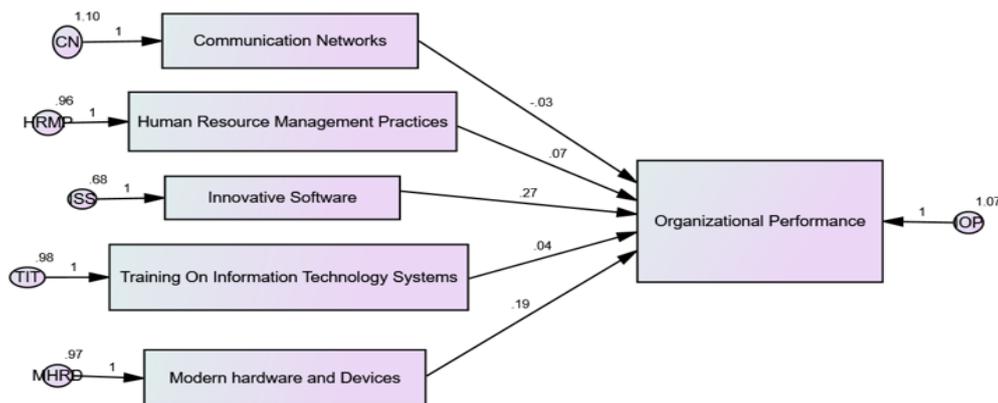


Figure 3: Selected Measurement Model of the 1st Order

Table 9: Indices of the Goodness of Fit (AMOS, 2022)

Incremental indices	Results	Normed indices	Absolute indices	Results	Normed indices
NFI	0.949	>0.9	RMSEA	0.002	<0.05
TLI	0.988	>0.9	RMR	0.003	<0.05
RFI	0.953	>0.9	GFI	0.955	>0.9
CFI	0.979	>0.9	AGFI	0.992	>0.9
	X2/ddf				<3.5

The (GFI) is  $0.955 \geq 0.90$ . The (RMSEA) value is  $0.002 \leq 0.05$ . The (RMR) has a significant value of 0.003, which is lower than 0.05. The resulting indices authenticate the validation of the model and confirm its goodness of fit. These indices are measured to the end of re-examining the relationship between variables. The latter is confirmed within the regression weights.

Table 10: Regression Weights (AMOS, 2022)

			Estimate	SE.	CR.	P
Organizational Performance	<---	Communication Networks	.528	.037	8.752	***
Organizational Performance	<---	Human resource management practices	.671	.040	1.796	***
Organizational Performance	<---	Innovative Software	.568	.047	5.703	***
Organizational Performance	<---	Training in information technology systems	.640	.039	1.015	***
Organizational Performance	<---	Modern hardware and Devices	.488	.039	4.773	***

The P value is highly significant  $\leq 0.01$ . Verified hypotheses are summarized in the table below.

**Table 11: Hypotheses Summary**

Communication Networks and Organizational Performance	<b>H.3 o:</b> There is no significant statistical relationship between communication networks and organizational performance.	<b>Rejected</b>
	<b>H.3 a:</b> There is a significant statistical relationship between communication networks and organizational performance.	<b>Validated</b>
Human resource management practices	<b>H.3 o:</b> There is no significant statistical relationship between human resource management practices and organizational performance.	<b>Rejected</b>
Organizational Performance	<b>H.3 a:</b> There is a significant statistical relationship between human resource management practices and organizational performance.	<b>Validated</b>
Innovative Software	<b>H.2 o:</b> There is no significant statistical relationship between innovative software and organizational performance.	<b>Rejected</b>
Organizational Performance	<b>H.2 a:</b> There is a significant statistical relationship between innovative software and organizational performance.	<b>Validated</b>
Training in information technology systems	<b>H.3 o:</b> There is no significant statistical relationship between Training in information technology systems and organizational performance.	<b>Rejected</b>
Organizational Performance	<b>H.3 a:</b> There is a significant statistical relationship between Training in information technology systems and organizational performance.	<b>Validated</b>
Modern hardware and Devices	<b>H.1 o:</b> There is no significant statistical relationship between modern hardware and devices and organizational performance.	<b>Rejected</b>
	<b>H.1 a:</b> There is a significant statistical relationship between modern hardware and devices and organizational performance.	<b>Validated</b>

## 5. Conclusion, Recommendations, And Avenues For Future Research

Statistical analyzes answered the research questions. The analyzes were limited to linear regressions but embraced the confirmatory analysis in AMOS, asserting the relationship between dimensions of information technology (independent variables) and organizational performance (dependent variables). The study showed enhancing dimensions of information technology can improve organizational performance. Results emphasized that communication networks have the most decisive influence on organizational performance. Human resource management practices have the second influence followed by innovative software, Training in information technology, and modern hardware.

Efficient information technology is a competitive factor in the changing economics. To benefit from the enormous opportunities offered by Information technologies, managers concerned about the future of their business must increasingly strengthen their performance in all areas of business management. This action must be within reach of executives responsible for tactical and operational decisions to provide extensive relevant, reliable information rich in quality that circulates upstream and downstream within the company. Organizations can achieve productivity gains through adequate information technology dimensions that strengthen their competitiveness and contribute to sustainable economic growth. Through

digital connectivity, organizations implementing information technology contribute to the knowledge economy.

It is recommended to structure a long-term quality approach associating information technology and organizational performance. The formalization of quality procedures is an opportunity to establish an inventory of the operation and analyze the gaps between the desired situation and the practice. When technology information is applied on operational level managers can assess the opportunity to build on recognized standards (Lean Six Sigma in particular) and quality management standards (ISO 9001). The manager must ensure that the information technology managers have quality tools and communication network resources to enhance organizational performance. A practical corporate governance framework must include the following elements to improve the implementation of information technology:

- A comprehensive strategy that responds to the operational needs and priorities of the organization and allows the total return on investment should be reviewed and updated periodically.
- A well-functioning information technology steering committee composed of senior managers. Members of the committee should meet regularly to supervise the execution of strategies. The functions of the committee should be reviewed periodically.
- Senior management with strong leadership of information technology infrastructure with global powers and competencies and access to financial resources.
- A well-structured mechanism to monitor the application of the information technology strategies

The analyzes of Li *et al.* (2021); Sánchez Limón and De la Garza Cárdenas (2018); Ilham, Ekowati, and Handriana (2021); and Sanjaya and Mayola (2019) go in the same direction as supported hypotheses and thus confirmed the empirical and theoretical framework. The dimensions of information technology, in particular dimensions assessing modern hardware and devices, innovative software, communication networks, Training in information technology systems, and human resource management practices, have a higher impact on organizational performance. This influence increases when these practices are used in harmony in governmental organizations.

This study has significant limitations. The first limitation is undoubtedly associated with its ability to generalize the results to another sector of activity. This research should therefore be repeated in other sectors to evaluate the extent of results generalizations. A second limitation concerned with the time limitation to collect information. However, it was difficult to extend the time limitation for a study adapting this scale. The latter was related to the use of the questionnaire. The questionnaire has the advantage of being inexpensive and when the relationship between the variables is clear, if the order of causality is detected. A one-time survey describes specific characteristics of a population or sample at a given time. Consequently, it is static. A longitudinal study can solve this limitation.

Of course, this research does not only have limitations. It also has strengths that should be mentioned. First, it should be mentioned that this study was done on a large scale. It goes beyond the simple description of variables and dimensions and the analysis of their relationships. Still, it enriches the literature with a new confirmed model that future studies could test. This database can therefore serve as a starting point for future studies to deepen the subject or part of the subject. On a practical level, this research allows managers in decision-making positions and HRM experts to identify the relations between dimensions of information

technology with the highest potential to improve organizational performance. It serves as a guide in their intervention during the design and implementation of their long-term strategies. The literature review and the study's results make it possible to advance applicable actions in practice. This combination is relevant since the studied subject is of significant concern to modern organizations looking to upgrade their information technology and organizational performance. A subject of high interest for managers.

Several avenues from this research can be explored to deepen the knowledge of information technology and organizational performance. Collected results reached the objectives; however, they are insufficient to understand the overall phenomenon in the business world. This single study should motivate researchers to use the same variables with different dimensions. Interesting dimensions could be added to embrace strategic management related to information technology. Organizational climate, leadership style, or culture could be introduced in the model as mediating variables between information technology dimensions and organizational performance. Organizational performance could be divided into dimensions embracing social, economic, and financial performance. Organizational procedures' influence on reengineering information technologies contributing to operations management should also be studied. Indeed, implementing advanced technologies requires the commitment and support of all organization members and a substantial upgrade of the various organizational functions.

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