Use of information Systems in Yemeni Universities Future Vision

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Abstract— This research examines the use of computed information systems in Yemeni universities through the use of intermediate variable technology to test the indirect impact of the information systems structure on the relationship between information technology, and the final performance in the computed information systems in Yemeni universities. The applied situation was exemplified by the selection of four universities where the data on the study were collected through special friendly questionnaire, and the number of respondent (224) persons had been used. Many statistical means, percentages, arithmetic mean, standard deviation, and intermediate deviation have been used for the description of the study sample, and for the study variables, as for hypothesis testing, the intermediate variant method was used and the end result was to prove that there was a relationship An incomplete mediation attributed to the structure of information systems that has an indirect impact on the resulting relationship between information technology and the final performance of information systems.

Keywords—Information Systems, Information Technology.

I. INTRODUCTION

The last two decades have witnessed a worldwide proliferation of information and communication technologies (ICT, henceforth) into the field of education. The global adoption of ICT into education has often been premised on the potential of the new technological tools to revolutionize an outmoded educational system, better prepare students for the information age, and/or accelerate national development efforts. In developing countries in particular, the above promises have generated a whole set of wild speculations about the necessity of educational reforms that will accommodate the new tools [1]. Governments in most developing countries have responded to the challenge by initiating national programs to introduce computers into education. Doing so, these governments have added to their burden of debt ''even though the costs are large and the payoffs modest'[2]. Benzie indicates that national programs have been of limited success not only because they were formulated in non-educational realms, but also because they were not based on research. In [3] the ''initiation stage'', which demands information gathering and planning, seems to be missing in this headlong process of technology implementation. [4] Remarks that in many cases computers were introduced into schools not as a means, but as an end. Computers were provided with no supplementary measures to enable educators to develop positive attitudes toward the new tools and to use them. This has often resulted in adhoc approaches to implementation. In this approach, technology availability is mistaken for technology adoption and use. However, As [5] states ''regardless of the amount of technology and its sophistication, technology will not be used unless faculty members have the skills, knowledge and attitudes necessary to infuse it into the curriculum'' (p. 398). That is, teachers should become effective agents to be able to make use of technology in the classroom. Ultimately, teachers are the most important agents of change within the classroom arena. Most of the universities in developing countries suffer from common problems such as lack of awareness, resources, and infrastructure [6–7]. In some countries, culture and mindset have become a major problem facing the application of e-learning platforms. Their universities and governments are struggling for fully functional e-learning systems, but all efforts seem to be worthless [8]. The inability of the developing countries, including Yemen to achieve the full use of e-learning has led many researchers to encourage further studies to try to understand the reasons behind the unsuccessful implementation of e-learning in their countries [9-11]. Some public universities are trying to adopt fully functional e-learning systems, however, they

are unable to achieve all the benefits and goals [12, 13]. Based on literature, these challenges are related to the individual differences and the cultural background of the lecturers as well as their awareness and attitudes towards e-learning [14, 15]. In view of the fundamental and transformer role of the information system in Yemeni universities, and in the face of the large inters haring between the elements of the information system and the successive developments in technology information, and to ensure the integrity and reliability of the information provided by the system, it was to be chosen standard methods to keep up with these developments and the interrelationships between units and system elements. If the traditional research methods used by the former and which divide the research variables into a variable independent variable may sometimes be futile, the effect of the independent variable on the dependent variable may be passing through a third variable called the intermediate variable, and when using the linear regression Simple or Multiplayer the independent variable's effect on the dependent variable may be incomplete and may be the indirect (master) effect, but it passes through a third-intermediate variable, so the regression equation is not capable of measuring the entire effect of the dependent variable on the dependent variable. To avoid these forms the mediation relationship test will be conducted and verified and the problem of the study can be determined by the following question: Is there a mediatory relationship to the information regulatory structure that has an indirect impact on the relationship between information technology and the eventual performance of information systems.

II. STUDY OBJECTIVES

The personal study seeks to active the following aims: To Highlight the need to use variable-broker technology as an additional analytical tool when using regression analysis method.

To disclose of mediation and an indirect role of the organizational information structure; its impact on the relationship between each information technology and the ultimate performance of information systems.

To identify the reality of the technical and technological environment of the information systems calculated in Yemeni universities.

III. Related work

The According to [18] that, Information Systems Technology consists of five main components in general namely software, hardware, network and communication, people and skill, and procedure and standards. The software consists of the detailed preprogrammed instructions that control and coordinate the computer hardware components in information systems. Software is often divided into two categories namely systems and application software. While system software includes the operating system and all the utilities that enable the computer to function, application software includes programs that do real work for users. Hardware is the physical equipment used for input, processing and output activities in an information system. The network and communications includes the physical devices and software for sharing thru the links for data and resource sharing. The human resources are considered as the knowledge of the Information Systems Technology workers including the skill. The standard operating procedures (SOPs) contain the procedure and standard which are incorporated into the information system, which includes the informal work practices. Correspondingly, another division was presented by O'Brien [19] who divided the Information Systems Technology into six components namely software, hardware, human factor, network, procedure and standards. [19] defined the human factor as related to the capabilities of the hardware and software towards the comfort, safety ease of use and user customization of the computerized systems. The network is also related to the communications that include the communication channels and devices including the communication between the interconnected systems.

1.Software: The software is considered as a critical component for improving information flow performance and Measurements on the software qualities are also important. [20, 29] indicated that reliability and comparability are the key components to assure and assess software quality. The characteristics of the quality are:

•Efficiency: The capability of the software product to provide appropriate performance, compared with the amount of resources used and under stated conditions.

•Reliability: The capability of the software product to maintain a specific level of   performance when used under specified conditions.

•Functionality: The capability of the software product to provide functions that meets the stated needs when the software is used under specified conditions.

•Usability: Reducing the learning time and consistent with the service provided.

•Maintainability: adding and removing the component without affecting the performance of the application and meeting the changes of demand.

•Portability: The system product is built according to the technology that can be transported and operated on different environments and platforms.

2.Hardware: Hardware is the physical component of the system. This research argues that the hardware technology is a critical component for improving information flow performance of the Strategic

Information System Planning implementation. For instance, accuracy of information flow depends on many aspects including hardware devices. Users communicate with computers in an information system through input and output devices. The user enters input data into the system through input devices, and the data is processed by the internal system and finally the output information is presented through the output devices. It is extremely important for organizations to select and use the right hardware technology for improving information flow. Selection and use of hardware must be managed properly because given technology can have tremendous impact on the performance of organization's information flow. Following this understanding, the hardware measurement contributes towards improving the information flow performance of the Strategic Information System Planning implementation. Regarding this, [21, 29] indicates that hardware can be assessed based on the following perspective:

- Easy to upgrade and scale up;
- Easy and quick to adapt for changing needs and standards;
- Provide support to business growth;
- Easy to be added to, modified or removed;
- Scalable and can be used by a large number of users concurrently.

3.Human resources: There are a number of factors that contribute to the success of an organization. It is not only the quality of the physical resources or the technology that counts, but the people and their skills and most importantly their commitments also make the difference. Allocation of the Information Systems Technology personnel's knowledge and skills is essential for improving performance related to operational activities and project management [22]. [24], [19] and [23] indicated that staff commitment such as cooperation, loyalty to organization, excellent team spirit, and job satisfaction and commitment, loyalty to supervisor and commitment to the organization are the measurements for the job performance. Hence, enhancing and maintaining adequate managerial skills of Information Systems Technology personnel can improve the competency of the Information Systems Technology personnel [21].

4.Network and communication: Networks provide connectivity and enable the organization to enhance information flow, improve the work process, administration connectivity and communication across the entire organization. Network and communication are, therefore, important components which should be taken into account to be measured for justifying the performance of information flow. The network measurements are related to the network administration, resources, and communication channel. Network reliability is important for better customer communication

and satisfaction [25]. The network resources is measured based on the network capacity, the speed of information that is delivered through the networks, and the penetration of the network coverage.

5.Procedure: A procedure is a specified series of actions or operations which have to be executed in the same manner in order to always attain the same results under the same circumstances. A procedure usually induces a change. [26] indicated that the procedure tells people regarding the practice of what they should or should not do. The procedures may be included in the resource manuals, and other manuals. Procedures should be managed efficiently to attain the best of the Information Systems Technology implementation (Bianchi 2001). Procedures are important component to align strategic planning with business strategies. The procedures and policies are derived to facilitate the implementation of the perused strategic plans of the organization [28].

IV. HYPOTHESIZE OF STUDY

Based on the research question of the study, the following hypotheses were generated:

Hypothesis 1: There is a positive relationship with statistical significance and performance.

Hypothesis 2: There is a positive relationship with a statistical significance between the organizational structure of information and information technology.

Hypothesis 3: There is a moral positive relationship between both the performance and the organizational information structure.

Hypothesis 4: There is a positive, statistically significant relationship between performance on the one hand and both information technology and the organizational information structure on the other hand. (3) designation.

V. THE FRAME OF STUDY
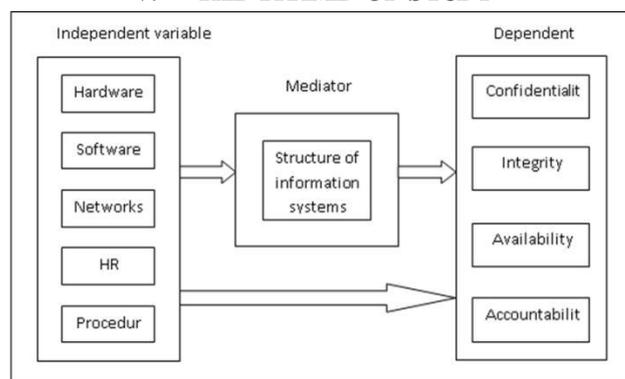
VI. METHODOLOGY OF THE STUDY

Analytical approach was used where the study sample was described, the study variables, and when the study hypothesis was tested, the evident side was used by a simple, linear gradient.

Study sample properties: The study community consists of all the main Yemeni public universities, which are 10 universities among this specific community. Five universities were selected. Through the general data collected from participant by the first part of the survey form, and using statistical repetitive and the characteristics of the study sample were defined in order to identify the characteristics of the participants in terms of scientific, practical and social composition, these attributes represent variables whose change in the outcome of this study may affect if It was subsequently re-applied, and its change in the results of similar studies would affect the same society as this study, and the result of this study was taken as an attempt at its results. The repetitive distributions of some of these variables were presented in the following order: scientific qualification, employment, age, duration of work experience, and career level.

VII. RESULT AND DATA ANALYSIS
Demographic Analysis

1-Sample for the type of university: The descriptive statistics involving frequencies and percentage for the type of universities are shown in Table 1. As shown Ibb university represent 26.8 % followed by Taiz and Sana'a university with 20.1% each, Aden university with 19.6% and the last one was Hodeida university with 13.4%.

Table.1: Distribution of participants according to type of universities.

Universities	Frequency	Rate
Hodeidah University	30	13.4
Taiz University	45	20.1
Sanaa University	45	20.1
Aden University19	44	19..6
Ibb University26	60	26..8
Total	224	100.0

2-Sample for the type of Colleges:

In the present study the descriptive statistics involving frequencies and percentage for the type of collage are shown in Table 2. As shown information technology center represented 50.9 % and Faculty of computing with 49.1%.

Table.2: Distribution of the participants according to type of collages.

Faculty	Frequency	Rate
Faculty of Computing	110	49.1
Information Technology Center	114	50.9
Total	224	100.0

3-Sample for the type of Job: In the present study the descriptive statistics involving frequencies and percentage for the type of job are shown in Table 3. As it`s shown that implementers represented high percentage with 28.6% followed by technical with 27.2% and the last percentage found among higher management with 6.3% .

Table.3: Distribution of participants according to their natural work

Functions	Frequency	Rate
Higher Management	14	6.3
Academic	25	11.2
Technical	61	27.2
Managers	60	26.8
Implementers	64	28.6
Total	224	100.0

4-Sample according to their specialization: In the present study the descriptive statistics involving frequencies and percentage for their specialization are shown in Table 4. As it`s shown that computer represented high percentage with 40.6% followed by others with 24.1% and the last percentage found accounting with 8%'.

Table.4: Distribution of the participants according to their specialization.

Specialization	Frequency	Rate
Counting	27	12.1
Administration	34	15.2
Other	54	24.1
Computer	91	40.6
Accounting	18	8.0
Total	224	100.0

5-Sample for Duration of Work Experience: In he present study the descriptive statistics involving frequencies and percentage for duration of work experience are shown in Table 5. As the table has shown that 45.5% of participants had experience duration 1-5 years, 28.1% of participants with duration of 6-10 years, 9.4% with duration 11-15 years, 8.5% with duration less than one year and the last 2.2% with duration more than 21 years.

Table.5: Distribution of participants according to duration of Work Experience.

Period of service	Frequency	Percent
less than one year	19	8.5
1-5 years	102	45.5
6-10 years	63	28.1
15-11 years	21	9.4
20-16 years	14	6.3
21 years and over	5	2.2
Total	224	100.0

6-Sample according to Sex and age:

The descriptive statistics involving frequencies and percentage for the demographic characteristics of the participants are shown in Table 6 and 7. As it`s shown, 54.9% of participants were male and 45.1% were female. The majority of participants ranged in age less than 30 years. In addition.

Table.6: Distribution of participants according to their Sex.

Sex	Frequency	Percent
Male	123	54.9
female	101	45.1
Total	224	100.0

Table.7: Distribution of the participants according to their age.

Age	Frequency	Percent
Less than 30 years	108	48.2
31-45	100	44.6
46-60	16	7.1
Total	224	100.0

7-The sample according to scientific qualification: The descriptive statistics involving frequencies and percentage for the demographic characteristics of the lecturers are shown in Table 8.. As its shown, 66.1% of participants had Bachelor qualification, 14.3% had diploma 9.8% had Ph.D and 8% had M.Sc qualification.

Table.8: Distribution of the participants according to their scientific qualifications.

Qualification	Frequency	Percent
Ph.D	22	9.8
M.Sc	18	8.0
Bachelor's	148	66.1
Diploma	32	14.3
High School	4	1.8
Total	224	100.0

VIII. VALIDITY AND RELIABILITY OF MEASUREMENT TOOL:

1-Validity of items :The verification, accuracy, validity and clarity of the formulate of its questions, and the extent to which the paragraphs belong to each dimension to dimensions have been displayed to a group of statisticians, as well as specialists in information technology and systems, to assess the validity of the paragraphs in the questionnaire, the result of arbitration was that all test clauses were valid and were approved by the experts of the arbitrators.

2-Statistic Validity: Further reassuring the accuracy of the paragraphs and verifying their honesty, the statistical analysis of the test clauses was adopted by calculating the correlation coefficients for each axis. The measure of the axis (dimension), which is an indicator of the truthfulness of the paragraphs, and of the axis. To achieve the above, the data is statistically analyzed using the sequential correlation coefficient and the tables below showing the values of the sequential binary link coefficients, the independent variable, the intermediate variable, and the dependent variable.

Table.9: Showing the values of the sequential binary link

Correlations		X_1	X_2	X_3	X_4	X_5
X	Pearson Correlation	.624**	.780**	.739**	.813**	.801**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	224	224	224	224	224

**. Correlation is significant at the 0.01 level (2-tailed).

Table.10: Showing the values of the sequential binary link coefficients

		M_1	C_{12}	C_{13}	C_{14}	C_{15}	C_{16}	C_{17}	C_{18}	C_{19}	C110	MC
M	Pearson Correlation	.687**	.747**	.754**	.784**	.771**	.763**	.645**	.673**	.655**	.771**	1.000**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	224	224	224	224	224	224	224	224	224	224	224

Table.11: Showing the values of the sequential binary link coefficients

		Y_1	Y_2	Y_3	Y_4	Y
Correlations						
Y	Pearson Correlation	.582**	.578**	.786**	.794**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	224	224	224	224	224
**. Correlation is significant at the 0.01 level (2-tailed).						

The result showed that the value of the correlation coefficient is a statistical function, which indicates that the test paragraphs are all truthful and distinguished for all the variables of study.

3- Reliability of the test: Reliability refers to "the extent to which a research instrument is dependable, consistent, and stable" [16]. Cronbach's (1951) coefficient was used to measure the reliability of the survey instrument and interview schedule in the same way as [17]. This coefficient is one of the tools that is most commonly used in measuring the internal consistency of research instruments (Cronbach, 1951).

4- Stability of Questionnaire: In addition to the validity assessment discussed above, the degree of reliability of the data and the availability of stability and the internal consistency between the answers of the questionnaire was tested. For this, we used the coefficient of Cronbach Alpha for measuring the degree of reliability and creditability of the respondents' answers to (sample of study) the questionnaire's questions. The coefficient of Cronbach Alpha depends on measuring the internal consistency of questions of the questionnaire in its ability to produce results which are consistent with the responses of the respondents. Alpha can be interpreted as the coefficient of the internal consistency among respondents. Therefore, its value usually ranges from zero to 1. The

statistically acceptable value for the coefficient alpha is (60%) or more in order to be a good measure of credibility and reliability and in such case, the results can even be generalized. Table 12 shows the results of Cronbach Alpha.

Table.12: Showing the values of the persistence coefficient.

Reliability Statistics	
Cronbach's Alpha	**N of Items**
942	65

Table.13: Showing the coefficient of persistence by the Half-tick method

Reliability Statistics			
Cronbach's Alpha	**Part 1**	Value	.914
		N of Items	33[a]
	Part 2	Value	.903
		N of Items	32[b]
	Total N of Items		65
Correlation Between Forms			.649
Spearman-Brown Coefficient	Equal Length		.787
	Unequal Length		.787
Guttman Split-Half Coefficient			.782

IX. DESCRIPTIVE ANALYSIS

The theoretical literature mentioned in the theoretical aspect of this study is a key platform for building and developing the questionnaire model, which is the key tool for measuring the effectiveness and performance of computer information systems in practice in Yemeni universities.

The study tool consists of the present questionnaire which contains two parts:

Part I: Specialization of the personal data of the sample respondents relating to the coverage of the universities included, colleges, careers, sex, age, experience, educational level, scientific specialization This information is significant in touching the reality of the target study in order to obtain more credible and realistic answers.

Part II: Consists of three dimensions under different names, all of which form the strategic planning of information system in Yemeni universities to improve performance in the structure of the university's administrative structure, It is the fundamental objective of this study and of the desirability of measuring it and verifying the extent to which Yemeni universities get benefit from the application of this system and the degree to which they serve their functions and their objectives.

In this light, the questionnaire dimensions have been identified as follows:

First Dimension: Information Systems Technology:

Second Dimension: Information Systems Structure:

Third Dimension: Performance of Information Systems:

The answer of each question was divided into five degrees, which were given relative weights according to a measure of Kert. Percent and average arithmetic and their implications were also specified when interpreting the results as follows: Table (14) Answer ladder, relative importance level and average value.

Table.14: The answer ladder, relative importance and average value

Degree	Strongly Agree	Agree	Neutral	Not agree	Not very agreeable
Relative weight	5	4	3	2	1
percentage	Greater than 80%	60% - 80%	40% - 60%	20% - 40%	Less than 20%
Percentage indication	The effect is very high	High impact	Medium effect	Low effect	No effect
Average value	Greater than 3.5	From 2.5 - 3.49			Less than 2.49
Mean of the mean	High		Medium		Poor

First: Information Systems Technology

In this study, the information technology means the basic techniques used in computer-based information systems and their practical applications, including the hardware and equipment used, software, human resources, networks, procedures, which are used in the entirety as a comprehensive framework for the diverse capabilities whereby data is collected, stored, processed and exchanged within the structure of the organization, as well as to provide appropriate and useful information to its users efficiently and effectively. This dimension was represented through the questionnaire with the aim of measuring and verifying the availability and effectiveness of the system's vehicles, which are the core pillar of the work of the Information System, where the dimension contains five interlocutors and each axis containing the set of questions, which measure the availability of the components of information systems technology, and the dimension as a whole for measuring the independent variable values of this study. After the necessary statistical analysis, the results were as shown in the table15.

Table.15: Descriptive analysis of information systems technology components

No	Information Systems Technology	Mean	Standard Deviation	Standard Error of Mean
1	Hardware	3.0116	.87211	.05827
2	Software	3.1038	74275	.04963
3	Networks	2.8259	88354	.05903
4	HR	2.8723	80310	.05366
5	Measures	2.7623	82670	.05524
	Total average		61841	.04132

In the present study and after the statistical analysis of the answers it's found that the arithmetic mean values of the five axes were ranging between 2.76 – 3.10, and the arithmetic mean value to total axles was (2. 92), which is less than the neutral value (3) as shown in table. This value indicate that the Yemeni universities have an average of information systems technology component. It`s also found that the percentage of the people who agree with context of this study sample is about 96%. , while the people who didn't agree with the context of this term is 4%. This percentage according to the standard error mean , and the standard deviation was low (.620) as shown in table… In this study the answers of the respondents of the sample number for each axis can be traced and interpreted as follows:

1.Hardware: This dimension contains a set of 5 questions that covered aspects to be identified in relation to equipment and questions focused on the complementarities of the different information systems in place. The impact of information technology on strategic performance, as well as the question of the available equipment to support UNU activities, the ability of donors to support project activities, and what technical outputs are working to improve performance.

According to the respondents of the study sample, the arithmetic average of respondents' responses to all sample members of this axis was (3. 01),. This value was slitely larger than neutral value (3), which indicated that the Yemeni universities seek to provide equipment for the information systems' work requirements averagely, and the percentage of respondent who agree from the sample study was 94%, while the percentage of those who did not agree with the context of this term was 6%, so that according to the standard error mean index, and the standard deviation was low at around (.870) as shown in table.

2.Software: This dimension includes many questions and desirable measurement which structured around, completed tradable projects, completed work unit, trend of variables expected function, and frequency of software packages that enhance institutional performance. The availability of advisory services and the ability to perform future service, as well as the availability of functions that

meet specific needs, and whether the system supports its users with confidence and accuracy. This study measured the content of the axis, according to the answers of the respondents and found that the arithmetic average was (3. 10), which slightly greater than the neutral value.

This high value indicates that Yemeni universities are interested in providing software and related information better than other information systems requirements as shown in table. Again our study found that the proportion of respondents to this axis was approximately 95%, while the proportion of those who did not agree with the context of the term was 5%, and according to the Standard Error Mean Inde and Standard Deviation was low (.740) as shown in table.

3.Network: This dimension includes many questions with a view to measuring the efficiency and availability of networking, improving information exchange with increasing vulnerability, and the availability of assisted desktops with automated systems to enhance communication and the availability of multiple outlets to access the network. In addition to the online analysis, publishing reports and linking to remote areas, and the number of users were able to access information through network.

In present study, Its reported that the average arithmetic reached around (2. 83), which is less than neutral value (4) indicating that networks and related ones are not widely available, and that the proportion of respondents to this term was about 94% of the study sample, However, the proportion of people who do not agree with the context of this term is 6%, according to the Std. Error Mean index, and Std. Deviation is low at approximately (.880) as shown in table.

4.Human Resources: Within the Organization's human resources group, which is responsible for providing information that is relevant and capable of expressing the Organization's operations as well as the preparation of clear and timely reports for the purpose of providing users with the differences in their categories, information that meets their information needs to meet the University's goals. In this aspect and under this dimension (8) are defined as questions to measure the effectiveness and performance of human resources, the questions are about the experience and skills of staff, the level of change of team members as well as the team's incentives to support the project, support and oversight of senior management as well as aspects of training and output measurement.

In this study it`s found that the arithmetic average of responses was (2. 87), which is slightly lower than the neutral value (3), and the percentage of responding who agree to this term was 95%, while those who don't agree was 5%, with a low standard deviation which found (800) as shown in table.

5.Procedure: This dimension includes questions that measure the degree of devolution of powers from senior management to lower administrative levels and define functions and duties in written and specific terms, and has included a group questions including job descriptions, documenting performance, review, update, organizational structure that is being developed, reviewing instructions, negotiating with supporters, and evaluating the needs and reports permanently. In the present study its found the arithmetic mean of the answers was (2.76) which was less than the neutral value, and the percentage of the respondents in the study sample is approximately 94% while those who do not agree with the term was 6%, according to the Std Error Mean Index and Std. Deviation was minimal at about .830 as shown in table.

Second: Information Systems Structure

The organizational structure of the management of information systems in Yemeni universities is the framework in which work will be arranged and coordination of efforts between personnel working in administrative levels to implement the various tasks and activities to achieve the objectives defined efficiently and effectively to measure the effectiveness of the organizational structure and its role in upgrading the system and strengthening the relationship between system requirements and performance in its final form. To measure this dimension through knowledge of the needs of the organizational structure of universities at different managerial and organizational levels of information and expressed through departments, departments and the rest of the administrative process, 10 levels have been identified for the various activities and functions of the universities. This dimension is also considered as an intermediate variable. this study includes the names of ten main departments and sections, which measured the need for those administrative levels against their computerized information activities, found that the arithmetic mean values of all departments and sections vary from (3. 78– 4.03), and found that the arithmetic mean values of the most likely axis was (3.90) which greater than the neutral value (3), and is closer to the value (4). Which indicated that the needs of managements and departments in Yemeni universities for information systems are very high. Regardless of the name and activity of those departments and managements, the percentage of respondents to those responses from the sample was about 95% and the percentage of those who did not agree with the term was 5%, according to the Std Error Mean Index and Std. Deviation was low (0 .730) as shown in table16.

Table.16: Descriptive Analysis of the Study of Sample Responses to the Organizational Structure.

Organizational Chart	Mean	Standard Deviation	Standard Error of Mean
Management and planning	3.85	1.125	.075
Services	4.00	.921	.062
financial management	3.96	1.050	.070
Technology Development	4.02	.982	.066
Customer Management	3.84	1.007	.067
Purchases	3.78	1.017	.068
Student records	4.03	.888	.059
Academic records	3.85	1.035	.069
Research activities	3.81	1.113	.074
Personnel	3.83	.959	.064
Average gross	3.8982	.73117	.04885

Third: Performance Information Systems

The ultimate objective of computerized information systems is to achieve efficient and effective performance that is capable of meeting the specific objectives of the Yemeni universities as well as to meet the diverse needs of the end user in a satisfactory and adequate manner. Whereas performance is indicative of the compatibility of information technology with complementarity of work in the information systems management structure. Four axes of this dimension have been neutralized (confidentiality, integrity, convenience, accountability), which include in its entirety (16) questions. This dimension is considered a variable to be used to measure the output of the system, through the answers obtained.

In the present study it`s found that the arithmetic mean values of the four axes vary between (3.25–4.12), and arithmetic mean value of the most axes was (3. 61), which is higher than the neutral value (3). This answers indicate that the performance of the information systems is high. The percentage of respondents to this evaluation was 96% while the percentage of respondents who do not agree with the context of this term was 4%. According to the Std. Error Mean index, and Standard Deviation was low at around (.620) as shown in table17.

Table.17: Descriptive Analysis of Performance Samples Responses

In details the study can explains each axes separately as follows:

1.Confidentiality: Ensuring the confidentiality of the information involves protecting it so that it is not available to unauthorized users. Therefore, sensitive information is not disclosed and the confidentiality of authentication, data monitoring, coordination and monitoring of computer network resources and users are ensured. To verify the procedures followed in this aspect, the axis includes four questions, namely access to all data, providing users with control mechanism, priority for logical protection, and the information on the server is placed on the Network.

In this study its found that the arithmetic mean of the answers, for this axis was (3.31), which is greater than the neutral value, a little which means that the secrecy is achieved on Average. The proportion of respondents on this axis was approximately 94%, while the proportion of those who disagreed with the context of this term was 5%, according to the Std. error mean, and the standard deviation was low at around (0.84).

2.Integrity: Information integrity is the crucial issue in the security of information exchange and integration. and prevent their destruction in the organizations. Safety is crucial in the Organization to gain confidence enough and give it credibility and integrity. In this context four questions are the preservation of reliable information, the protection of data from change and damage, the protection of the user's privacy access to all systems by authorized persons.

In our study found that the arithmetic mean, for this axis was 3.26, which is slightly greater than the neutral value, slightly meaning confidentiality is achieved on an average. The percentage of respondents to this focus was 94% while those who did not agree with the term context reached 5%, according to the Std error Mean, and Std. Deviation was low which was 84.0 as shown in table.

3.Availability: It is to ensure that the information is needed as the user needs as well as quantifiable and scalability of their informational systems if they are required and allow the user to obtain the required information whenever he desires and wherever he is. Such characteristics can be made available through proper planning of information systems management to maintain sufficient capacity so that in the event of a possible failure of certain devices the system is not affected. In this context, four questions were set for measuring convenience, and whether the server is continuously available to customers, is the data stored and distributed and does malfunction of certain devices do not fail the system and is there backups of the stored and distributed data.

This study found that the arithmetic mean, for this axis is

| Performance of information systems	Mean	Standard Deviation	Standard Error of Mean
Confidentiality	3.3092	.84613	.05653
Integrity	4.1228	.90619	.06055
Availability	3.2545	.93240	.06230
Accountability	3.5703	1.02290	.06835
Average gross	3.5642	.64711	.04324

about 3.25, which is slightly greater than the neutral value, slightly meaning that convenience is achieved on an average. The proportion of the respondents of the study sample is approximately 94% and who do not agree with the term context of this term, according to the Std. Error Mean index, and Std. Deviation was low at approximately 0.93.

4.Accountability: It is important that there is a group of individuals within the organization responsible for any negative consequences, such as the losses incurred by the organization, as well as the deterioration of the system's performance or loss of customer confidence, for various activities with regard to security issues. The assumption is that the user will be subject to control and accountability for their actions. The focus included four questions: the protection of the system with antivirus software and the use of its surveillance equipment and the consideration of authentication, registration and data protection by authorized users.

The present study showed that the arithmetic mean of this axis was about 3.57 and is slightly greater than the neutral value, meaning that accountability is highly realized. The proportion of respondents to this assessment was 94%, while the proportion of those who violated the context of this term was 5%, according to the Std. Error Mean index, and the Std. Deviation was low at approximately (84.) as shown in table.

Second: Examining the hypothesis of the study:

The model specified for this study is based on the fundamental assumption that there is a mediating relationship between the independent variable and the dependent changed through a third variable called the intermediate variable and the default relationship of this model can take the following picture:

X — Independent variable   M — Mediator   Y — Dependent
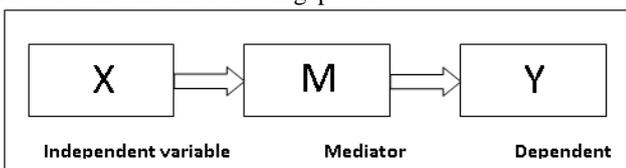
X.   STUDY METHOD

To verify the basic premise of this study, there is an essential broker (the organizational structure of information) for the relationship between the independent variable (information technology), and between and the dependent variable (information systems performance).After looking at a wide range of similar researches and studies, and reviewing the statistical methods that can be used to test the impact of the intermediate variable with a view to choosing the most practical statistical method in this study, it has been selected A simple, linear regression method is the most appropriate statistical method, which can be used to

express the relationship between the variables defined for this study through four consecutive phases as follows:

Stage 1: The impact of the independent variable is measured on the dependent variable.

Stage 2: The relationship between the independent variable and the intermediate variable is measured.

Stage 3: The relationship between the intermediate variable and the dependent variable is measured.

Stage 4: The last stage is the measurement of the multiple relationship between the independent variable and the variable and the dependent variable on the other.

The above four stages of testing the hypotheses of the study may be formulated according to the model of sequent equivalents for each phase, as follows:

1- $Y = B_0 + B_1 X$

2- $M = B_0 + B_1 X$

3- $Y = B_0 + B_1 M$

4- $Y = B_0 + B_1 X + B_2 M$

Where:

Y: The dependent variable that represents (the performance of information systems).

X: Independent variable representing (Information Systems Technology) .

M: The variable intermediary that represents (the organizational structure of information).

B_0: The fixed limit of the form.

B_1: The relative effect of the variable in the right side of the form is the variable on the left side of the form.

B_2: Relative effect of the intermediate variable on the dependent variable.

XI.   STUDY HYPOTHESES

First hypothesis: There is a positive correlation between the independent variable (information systems technology), and dependent variable (information systems performance).

Second hypothesis: The independent variable (information systems technology) affects positively the variable (the need for information).

Third hypothesis: The intermediate variable (organizational structure of information) affects a positive effect on the dependent variable (information systems performance).

Fourth hypothesis: There is a mediate relationship between the independent variable (information systems technology) and the dependent variable (information systems performance) by the intermediate variable (the organizational structure of information).

Determining the Study Variables:

Until the hypotheses of the study are tested it is necessary to specify the names of the variables in the forms as follows:

 X: Independent variable (Information Systems Technology).

Y: The variable's affiliate (performance information systems).

M: Variable Intermediate (Organizational Information Structure).

Test Study Hypotheses Procedures :

To test the main hypotheses of this study there must be three preliminary tests, which represent introductory hypothesis for the main hypothesis, and the fourth test is the main premise, which is the four stages. which is already explained in detail.

The first hypothesis: There is a positive correlation with a statistical significance between the independent variable (information systems technology) and the dependent variable (information systems performance). To test the previous hypothesis, the simple linear regression model was applied to measure the relational and the hypocyrical relationship between Information Systems Technology as the independent variable (X) and information systems performance as the dependent variable (Y). After analyzing the data based on SPSS, the model's parameters were obtained as shown in table18.

Table.18: Regression Analysis Summary.

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.522[a]	.273	.269	.55033
a. Predictors: (Constant), X				

Table.19: Regression variance analysis summary.

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	**Regression**	25.209	1	25.209	83.234	.000[b]
	Residual	67.236	222	.303		
	Total	92.444	223			
a. Dependent Variable: Y						
b. Predictors: (Constant), X						

Table.20: Results of model estimated.

Coefficients[a]					
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	**Constant**	2.027	.178		11.413	.000
	X	.544	.060	.522	9.123	.000
a. Dependent Variable: Y						

XII.   ANALYSIS AND INTERPRETATION OF THE RESULTS

1.Relational and procedural model:

The statistical analysis explained that the relationship formula between the independent variable (information systems technology), which takes the X symbol and the dependent variable (information systems performance), which takes the Y Symbol.

$$Y = 2.027 + 0.544 \ x$$

2-selection coefficient (R2):

The value of the selection factor has reached ($r2 = 0.522$) and this value reflects the percentage of changes in the dependent variable (information systems performance) that are interpreted in terms of the independent variable (information systems technology), either the rest of the deleted variables and the variables not included It interprets the remaining percentage (47%).

3. F-Testy test:

Through a generally regression moral test shows the calculated value of the test (Fcal=83.234). The semantic level that came (Sig = 0.000) is lower than the moral (5%) level as shown through the table above. These findings therefore confirm the existence of a linear moral relationship between the independent variable (information systems technology) and the variable (information systems performance). The relationship model is highly efficient in reconciling the data used in the study and can be adopted to represent the relationship between the study variables.

4.t-test:

A test (t) was used for the purpose of moral knowledge and the strength of the relationship between the independent variable and the model, and the test results as shown in table number (19) explained the moral fixed limit of the model as well as the regression factor of the independent variable, and the ratio of the effect on the dependent variable was estimated 544), and it has a moral significance (Sig Level=0.000) and is less than the error value (α=0.05).

5-Interpretation of the model:

Our result showed that the form obtained has exceeded all statistical tests, and that the relationship between the independent variable (information systems technology) and the dependent variable (information systems performance) came positive, as the relative impact of the independent variable on the dependent variable reached about (B1=0. 544) With a positive signal, which means that an increase in the value of an independent variable

(X) (Information Systems Technology) by about one point, this increase will be reflected in the dependent variable (information systems performance) of the relationship by (0.544). The relationship model explains (0.522) through the value of the selection factor (R2=0.522), and it can be said that the results of the analysis came to the realization of the hypothesis of the study in this aspect, depending on the forecast already established.

Second hypothesis: It has a positive and statistically significant effect between the independent variable (information systems technology) and the intermediate variant (the information organizational structure). The above hypothesis is applied the simple linear regression model, to measure the relational and impact relationship between each information system technology as a an independent variable (X), between the information organizational structure (M) as a dependent variable, and after the analysis and extraction of data.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.340[a]	.115	.112	.68920
a. Predictors: (Constant), X				

Table (21) regression analysis summary.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.770	1	13.770	28.989	.000[b]
	Residual	105.450	222	.475		
	Total	119.219	223			
a. Dependent Variable: M						
b. Predictors: (Constant), X						

Table(22) Regression variance analysis summary.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	Constant	2.727	.222		12.262	.000
	X	.402	.075	.340	5.384	.000
a. Dependent Variable: M						

Table (23) Results of model estimated.

XIII.   ANALYSIS AND INTERPRETATION OF RESULTS

Analysis and interpretation through previous tables shows that the formula of the relationship between the independent variable (X) information systems technology and the intermediate variable Organizational structure of

information (M) takes the following format: M=2.727+0..402X.

2-Selection factor (r2):

The selection coefficient is about 12% as the value obtained (R2 = 0.115), and this value represents the percentage of changes in the median variable (the organizational structure of the information) that is interpreted in terms of the independent variable (information systems Technology) and the variables not included in The study, which is not included in the model, interprets the remaining value at 88%.

3-f-test:

The regression morale test for the model generally shows that the calculated value of the test (fcal = 43.474) and the level of indication (Sig = 0.000) are less than the level of the specified morale (5%) As shown in table (22), It is inferred that there is a linear moral relationship between the independent variable (information systems Technology) and the intermediate variable (the organizational structure of the information).

The relationship model therefore has efficient data reconciliation and can be used to represent the relationship between the study variables.

4-T-test test:

When using a test (t) to identify the morale and strength of the relationship between the independent variable and the median variant of the previous model, the test results as shown in table (23) show the coefficient of the regression factor for the independent variable (X) where the effect ratio (B1 = 0.402) and the value Moral (Sig Level = 0.000) is less than the error value (α = 0.05).

XIV.   INTERPRETING RESULTS

Previous findings show that the model obtained exceeded all statistical tests and that the relationship between the independent variable (X) information systems technology, the intermediate variable of the organizational structure of the information was positive, and that the impact ratio of the independent variable on the median variant amounted to (0.402) with a positive indication, which indicates that an increase in the value of the independent variable (X) of information systems technology by about one point, this increase will result in the intermediate variable (the organizational information Structure) by (0.402).

The relationship model explains about 88%, which has been identified by the value of the selection factor (R2 = 0.115), So it can be said that the results of the analysis are to be achieved by the PRE-FORECAST study Hypothesis.

Third hypothesis: There is a statistically significant positive relationship between the intermediary variable (the organizational structure of the Information) and the dependent variable (information systems performance), and by reference to the results of the analysis of the applied study data through the use of the simple linear

model To know and measure correlation and effect by variable.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.451[a]	.203	.199	.57607
a. Predictors: (Constant), M				

Table (24) regression analysis summary.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.772	1	18.772	56.566	.000[b]
	Residual	73.672	222	.332		
	Total	92.444	223			
a. Dependent Variable: Y						
b. Predictors: (Constant), M						

Table(25) Regression variance analysis summary.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	2.065	.209		9.868	.000
	M	.397	.053	.451	7.521	.000
a. Dependent Variable: Y						

Table (26) Results of model estimated.

XV.   ANALYZING AND INTERPRETING RESULTS

1-Relational and impact model:

It has been shown through previous tables that the relationship model between the median variable and the organizational information structure (M) and the dependent variable of the performance of the information systems, which takes the symbol (Y) was as Next: Y = 2.065 + 0.374 m

2-Coefficient of determination (r2):

The results of the analysis showed that the value of the selection factor has reached (r2 = 0.203) and reflects the amount of impact on the dependent variable (information systems performance) that is interpreted in terms of median variable (the organizational structure of the information), while the remaining deleted variables are not included and not covered in The study explains the remaining percentage (80%).

3-f-test:

The regression morale test generally showed the calculated value of the test (fcal = 56.566) and the level of indication (Sig = 0.000) and less than the level of morale 5% as shown in table (25).

One of these results is the existence of a linear moral relationship between the median variable (M) and the dependent variable (Y).

The model obtained could be adopted to reconcile the relationship between the limited study Variables.

4-t-test:

When testing (t) to identify the morale and strength of the relationship between the median variable and the dependent variable in the model as evidenced by the test results in table (26) that the regression coefficient of the median variable reached (B1 = 0.374) and that the calculated moral value (Sig Level = 0.000) is less than the error value (α = 5%).

5-interpretation of the model:

based on the results obtained in the study form, it is clear that the model has exceeded all statistical tests, and that the relationship between the intermediate variable (M) of the organizational structure of the information, and the dependent variable (Y) the performance of information systems, has been positive, and the effect rate of the variable The median (M) is about (B1 = 0.374). We take the positive signal, which means that any increase in the value of the median variable results is an increase in the dependent variable, in other words, if the rate of change in the median variable increases by one unit, the result is an increase of the value of the dependent variable by 37%.

The relationship model explains about 20% since the value of the selection coefficient is (R2 = 0.203) and it can be said that the results of the analysis achieved the hypothesis of the study according to the specific Expectation.

Fourth Hypothesis: This is the main hypothesis that will now be tested after the previous three Tests have already been prepared. The intermediate variable (The Organizational Structure of Information) has a positive impact on the relationship between the independent variable (Information Systems Technology) and the dependent variable (Information Systems Performance).When the median variable (Information Regulatory Structure), The independent variable (Information Systems Technology) on the one hand, and the dependent variable (Information Systems Performance) on the other, and using the multiple linear regression are subject to the results shown in the tables

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.598[a]	.357	.351	.51860
a. Predictors: (Constant), M, X				

Table (27) regression analysis summary

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.007	2	16.503	61.363	.000[b]
	Residual	59.437	221	.269		
	Total	92.444	223			
a. Dependent Variable: Y						
b. Predictors: (Constant), M, X						

Table(28) Regression variance analysis summary.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	Constant	1.285	.217		5.930	.000
	X	.434	.060	.417	7.275	.000
	M	.272	.051	.309	5.385	.000
a. Dependent Variable: Y						

Table (29) Results of model estimated.

XVI.   ANALYSIS AND INTERPRETATION OF RESULTS

1-Correlation relational model:

After conducting the necessary analyses, it became clear that the relationship formula between the median variable (The Organizational Structure of Information M) and the independent variable (Information Systems Technology X) on the one hand and the dependent variable (Information Systems Performance Y) on the other hand, Takes the following figure: Y = 1.285 + 0.434 x + 0.272 m.

2-selection coefficient (R2):

In the dependent variable (Information Systems Performance Y) is interpreted in terms of the variables specified in the form, the median variable (M) and the independent variable (X), and the remainder of the variables that are not included in the form represent the remaining approximately 64%.

3-f-test test:

Through a multi-regression morale test in general, it turns out that the calculated value of the test (fcal = 61.363) and that the indication level (Sig = 0.000) is less than the level of morale (α = 5%) As shown in table (28).

Therefore, these results support a mediating relationship between the independent variable (Information Systems Technology X), and the dependent variable (The Performance of Information Systems Y) through the intermediary variable (The Organizectional Structure of Information M).

The relationship model is efficient in aligning the data used in the study and can be adopted to represent the relationship between the study Variables.

4- t-test:

A test (t) was used to determine the morale and strength of the relationship between the model variables, and the results recorded in the table (29) showed the morale of the regression coefficient for both the independent variable (X) and the median variable (M) were (B1 = 0.434) and (B2 = 0.272) respectively. The values of relative influence were moral.

5- Model Interpretation:

A balance, and that the mediating relationship of the median variable (the Organizational Structure of Information M) between the independent variable (Information Systems Technology X) and the dependent variable (The Performance of Information Systems Y) has been achieved, since the relative effect of the independent variable in the last multiple model was about (27%). and that The relative effect value (for The independent variable x) in the first hypothesis has reached (B1 = 0.544) and is greater than the value of the effect in the last multi-model, which confirms that there is a mediation of the partial median variable between the independent variant (x) and the dependent variable (Y). The effect ratio of the median variable on the dependent variant was (0.272).

Results and recommendations Findings and Suggestions:

The study concluded a number of results, which were most notable:

First: Information Systems Technology:

Information Technology System Turns out that the weighted average values of the availability of information systems technology components, expressed in the five arenas (equipment, software, networks, human resources, actions), ranged from 2. 76–3.10), the highest average value (3.1038) was software, which means more abundant than its IT constituents while the lowest average value of the average reached (2.7623), the actions are less abundant and the average arithmetic value of the most likely axles (2. 92), which is less than the neutral value (3), This means that the responses indicate that the Yemeni universities have an average of IT components and that the proportion of respondents to the study sample is about 96% and the proportion of those who do not agree with the term is 4%, according to the Std index. Error Mean , and the Std. Deviation Low standard deviation is about .620.

Second: Information Systems Structure:

When measuring the need for the Information Regulatory Structure, which includes the names of ten main departments and sections, namely (management and planning, services, financial management, technology

development, customer management , procurement, student records, academic records, research activities, personnel affairs) It is clear that the weighted average values of all departments and sections vary between (3. 78–4.03). The high value of the average reached (4.03), which meant that it was the most urgent and the need for the system compared to other departments, with a minimum of average value of 3.78, which was also a high value, although it was the lowest among other departments. The total weighted average of arithmetic value of departments was 3.90, greater than the neutral value (3), and closer to the value (4), which suggests that the needs of departments and departments in Yemeni universities for information systems are very high . Regardless of the name and activity of those departments and sections, the percentage of respondents to those responses in the sample was about 95% and the proportion of those who did not agree with the term was 5%, according to the Std index. Error Mean, the Std. Deviation standard is low at about .730.

Third: Performance of information systems:

It has reached the weighted average values of the performance of information systems in its own components (confidentiality, integrity, convenience, accountability), ranging from 3.25 to 4.12, and the weighted average arithmetic value of total axes (3. 61), higher than the neutral value (3), which means that the answers indicate that the performance of the information systems is high. The percentage of the evaluator of the study sample was approximately 96%, while those who did not agree with the term context reached 4%, according to the Std. Error Mean index and The Standard Std. Deviation is low at around (.620). And that safety got the highest value of the average, reaching (4. 12), which means that they are more abundant than their information systems performance banks, with a minimum amount of average of 3.25, and the convenience of convenience, which means that they are less abundant.

Fourth: Examining the study hypothesis:

With regard to hypotheses, the most important results can be summarized as follows:

1. All findings are consistent with the research hypotheses and the intermediate variable must be entered as an additional variable in the regression equation.

2. The inclusion of the regression model is an intermediate variable that will improve the performance of the model and becomes more accurate and realistic in representing the relationship between the variables and the most ability to illustrate the entire direct and indirect effects.

3. The following table illustrates the test case-sequential hypotheses that are up to the fourth model of the brokerage hypothesis.

No. Hypothesis	Model
1	Y=2.027+0.544X
2	M=2.727+0.402X
3	Y=2.065+0.374M
4	Y=1.285+0.434X+0.272M

Table (30) test of the sequence hypothesis

Where:

Y: The dependent variable that represents (Information Systems Performance).

X: Independent variable representing (Information Systems Technology) .

M: The variable intermediary that represents (the organizational structure of information).

The above table is illustrated by the examples:

First hypothesis:

The relative impact of the independent information systems technology has reached around (0.544) the variable dependent on the performance of information systems.

Second hypothesis:

The relative impact of information systems technology is about (0. 402) The intermediate variable has the organizational structure of the information.

Third hypothesis:

The relative impact of the intermediate variable has reached the organizational structure of information about (0.374) the variable dependent on the performance of information systems.

Fourth hypothesis:

A model that connects the independent variable (information systems technology and the intermediate variable organizational structure of information on the one hand and the variable affiliate performance information systems (0.434) and (0.272) respectively.

Through the previous results, it is clear that the model has exceeded all statistical tests and that the models confirm and verify the mediation hypothesis that exists between the independent variable (information technology and the dependent variable (performing system of colorings) through the intermediate variable (the organizational structure of information), as the relative impact of the fourth model of the independent variable reached (0. 373) This effect on the dependent variable is less than the effect of the first model and is (0.481) and thus this relationship is called an imperfect mediation of any partial mediation.

1- RECOMMENDATIONS

1. Intensifying the effort in building information systems for Yemeni universities as a key and indispensable tool in the University's tasks is indispensable and the necessity of the times.

2. Need to pay attention to the structure of information systems and provide the necessary inputs for this, as it has a substantial impact on activating the performance of information systems in general.

3. To try to understand and understand the factors that are interlocking with information systems, including regulatory factors that will promote positive integration of information.

4. The use of variable-broker technology in the control of performance of information systems enables careful diagnosis and knowledge of the mutual influence between the system components and grants through feedback reinforce whatever is positive and avoid the deficiencies that exist.

5. It is important to eat every Yemeni university with the same approach to this study, compare the results to make sure the model is more safe, as well as the possibility of using it in the stages of exchanging information between Yemeni universities.

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