RES MILITARIS
REVUE EUROPEENNE D ETUDES EUROPEAN JOURNAL OF MILITARY STUDIES
Social Science Journal

The impact of information technology on human resource performance: an applied study

By

Maitham Abbas Ibrahim
[1] College of Arts, Department of Libraries and Information Technology Mustansiriyah University /Iraq
Email: matham.iq22@gmail.com

Kholoud Ali Oraibi
College of Arts, Department of Libraries and Information Technology Mustansiriyah University /Iraq
Email: dr khuloodalialazawi@yahoo.com

Abstract

Information technology can affect the performance of human resources, as it provides assistance to raise performance and provide the best, For the purpose of clarifying the impact of information technology on the performance of human resources, a number of research forms were distributed in this research, (140) forms included the(information technology)variable represented by three variables(physical Components, software and human components) ,the dependent variable (human resource performance) included two sub-variables (Efficiency and Effectiveness). Numerical results showed the strength of the relationship between all research variables. The results also showed a significant effect of all information technology variables on performance variables. The effect of mediating variables such as (competition, economic factors) can be found as mediating variables that affect performance.

Keywords Information technology, human resource performance, efficient operations, Effective management, Physical components, Software, human components

1) General introduction

The strong relationship between information technologies and performance can lead to an accelerated development in the performance of human resources and provide the best by taking advantage of the advantages offered by information technology.

On this subject, many studies have been presented such that:-

The research presented by the researcher (Mishra A) and others in (2010), which included the study of the impact of information technology on performance through the study of (106) opinion polls for a group of IT managers in Turkey, the research included presenting the theoretical aspects to trends in the use of information technology in Human resources also include the uses and types of information technology. The results showed the clear impact of information technology (Choi, 2010, pp. 855-870)

The research presented by the researcher (Vrontis .D) and others in (2022), which included the study of robotics and artificial intelligence, which is growing rapidly, and the study aims to understand the regulation of intelligent input and automation, the study included research in (13,136) possibilities, the results showed that automation constituted a new approach Enhances the company's performance.

The presented research included a study of the relationship and impact of information technology on the performance of human resources by putting up a questionnaire that included the variables of both information technology and human resources performance**.** (Vrontis, 2022, pp. 1237-1266)

2) Aim of research

The research aims to know the strength of the relationship between information technology and performance. The research also aims to know the impact of information technology on performance.

3) Importance of research

There is an increasing importance of information technology, as it provides assistance to human resources and thus helps in achieving the best performance of human resources, which leads to the development of work in various fields.

4) Research proposal

There is a strong statistically significant relationship for information technology represented by the variables (physical Components, software and human components) with all human resources performance variables represented by the variables (Efficiency and Effectiveness).

There is a statistically significant effect of information technology represented by the variables (physical Components, software and human components) o all human resources performance variables represented by the variables (Efficiency and Effectiveness).

5) Information Technology

1-5) Definition of information technology

One of the tools used by leaders and decision-makers to adapt the changes, which represents the technological infrastructure of the institution and consists of software, communication networks, devices and databases approved in building an information system for the institution

2-5) the benefits of information technology

Information technologies have an effective role in the success of institutions of various orientations (educational, economic, administrative, political ... etc.) because of their significant impact on the performance of the institution and its human resources. The institution derives its benefits from modern technologies as it provides (Aral, 2012, pp. 913-931)

a- Efficient operations

As most institutions seek to achieve a general policy of obtaining the highest benefit at the lowest costs.

b- Effective management

The effective management of most institutions results in the ability to produce useful outputs that achieve the satisfaction of the beneficiaries of the human resources working in them and the beneficiaries from outside the institution.

c- Competitive advantage

The process of using information technologies to produce operational and management activities in an efficient and effective manner to improve business management, as well as following a policy of reducing costs to have an advantage compared to competitors.

The following figure shows the benefits derived from information technologies

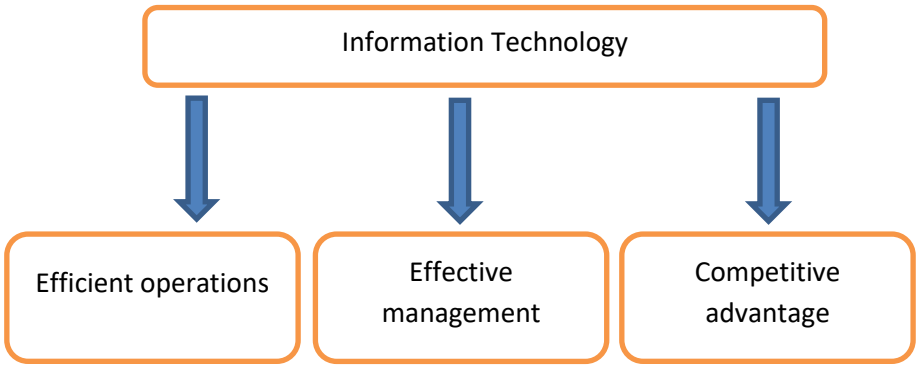

Figure (1) *The benefits derived from information technologies (the source is prepared by the researcher)*

The researcher believes that the information is a prominent role for the institution in terms of determining its position in relation to its competitors in order to maintain the outstanding performance of its human resources.

3-5) Information Technology Jobs

Information technology functions vary according to the nature of the purpose of its use, which is:

a- obtaining information

By collecting and storing information about subordinates in institutions, or information related to outside the institution.

B-Information processing

The processing process takes several forms according to the type of information (audio, visual, text) so that it transforms into different, more detailed forms.

c- Information generation

It means organizing information and data in a useful way, whether in its original or new form.

d- Information transfer and transfer

It means the process of transferring information between two or more parties using various traditional devices (oral or written transfer process) or using electronic devices (fax, calculator using the website, mobile phone).

E-Storage

It means the method of preservation, either on magnetic disks or on memory.

F-Retrieval

It means the retrieval time, ease and accuracy, on which the efficiency of the system depends.

g- Modernization

Which results from the change in information needs.

4-5) Information Technology Components

There are several components of information technology that can be summarized as follows ((Sanin, 2021, pp. 277-282)

a- Physical components

represented by devices and equipment, which are divided into three sections (input devices, output devices, processing devices) and their accessories from the devices associated with dealing with information, knowing that the main objective of dealing with these devices is to complete the tasks assigned to them with high accuracy and speed, including Ensures minimizing effort and eliminating red tape within the institutions.

b- Software

One of the intangible components in the world of technology and is divided into two parts: system software and application software, both of which depend primarily on human skills.

c- Human components

They control the work, operation, and management of other components of information technology, and it is not possible for any institution to be devoid of this group, which is represented by experienced people.

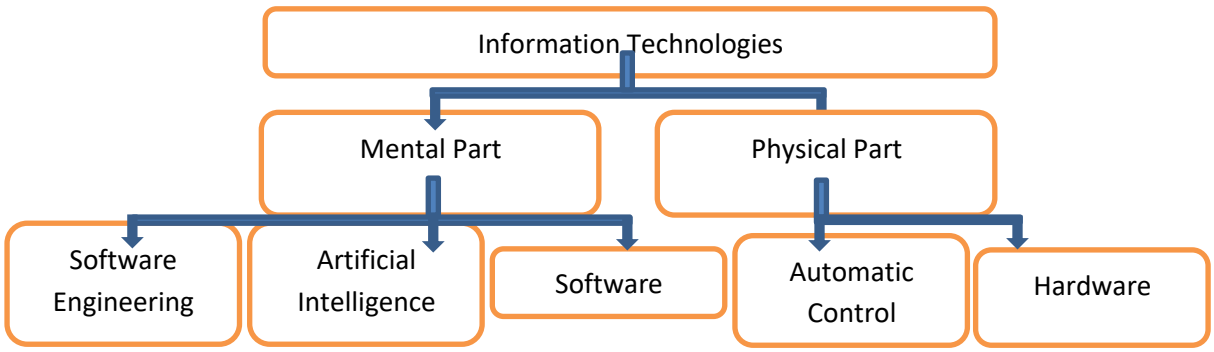

Figure (2): *Information Technology Components (the source is prepared by the researcher)*

The researcher believes that any process related to the technical aspect of information basically consists of two parts, material and intellectual, one of which complements the other in accomplishing the tasks entrusted to it. The Internet of Things Until now, machines are powered by human-made software

5-5) Information technology tools

There are many technical tools for information circulation, including these tools (Alami, 2015, pp. 251-254)

a- E-mail: It is a system in which information is transmitted in various forms of messages, recommendations and others from one side to another through an electronic box stored on the computers of individuals and institutions, through which it can be read, stored and answered.

b- The electronic exchange of information or data (by means of hard disks, external hard drives or flash) and it is considered one of the common means of transmission between computers and those working on them.

c- The intranet network, which allows the responsible managers (in the training process) to know plans such as production work programs for all other departments, and thus realistic and consistent plans can be developed to implement these programs.

d- The Extranet: It is a network for linking the networks of research centers with the beneficiaries that bring them together in joint work and aims to strengthen participation and ensure the exchange of information while preserving the privacy of the local intranet of each center.

6-5) importance of information technology:

The importance of information technology comes from the following points ((Aral, 2012, p. 919)

a. The process of transmitting information independently and quickly over distances.
b. b-Simplify the use of complex analytical methods to support operations.
c. Provides many and detailed information about operations.
d. d-Achieves changes in results by enabling multiple tasks to run automatically.
e. e-Allows coordination of operations through knowledge and experience.

The researcher believes that the importance of information technology in administrative work comes through its impact on the moral side of employees towards increasing loyalty and belonging to the institution, as well as the opportunities it provides for easy access to information, which contributes to enhancing their participation in the decision-making process.

7-5) Use of information technology to support the performance of information management ((Mishra, 2010, pp. 271-290)

Information and communications technology significantly supports information management by collecting data and information, generating reports smoothly and easily, as well as transferring and storing them in databases, retrieval on demand, reusing them, and transforming them into various applied aspects upon reuse, and the resulting broadcasts, media and delivery in information management. As an administrative unit in the institution, and what is reflected in it from the applications related to the follow-up of the implementation of the work, as shown in the table below.

Table (1) Methodology of using information technology in information management

Monitor results	**Objectives** **Results**	**improvement and development** **Effects of the results on the beneficiaries**
implementation monitoring	Output Activities Input	Services provided Assigning inputs to outputs Financial, human and equipment output

8-5) Information technology and its role in administrative processes

Communication processes within the organization have many forms, and this is due to the reasons, including (the size of the organization, the type of technology used, and the degree of association of the organization with the external environment). The organizational units are

in the same organizational level and the other are vertical communications: ascending and descending, which are between the organizational levels within the organization from top to bottom and vice versa, and verbal informal communications (Altınay, 2016, pp. 663-667)

9-5) Information technology dimensions

There are several dimensions of information technology, which have a role in developing the performance of human resources and enabling them to perform their jobs by providing them with data and information using telecommunications networks, devices and equipment (computer, scanner, printers) as well as databases. Staff management stores a huge amount of data With so-called databases and through special repositories for the huge data that occupies a large storage capacity, where the databases are known as a set of relevant facts, and accordingly, the dimensions of information technology were limited to [2]

Devices and equipment:

They are of two types - computer and its accessories (printer, scanner, LCD display)

b- Digital devices and mobile phones.

Software: There are types of programs called the text, tables, and graphs program, and it works to create work-related documents, which facilitate the completion of administrative work.

c- Databases:

The staff management stores a huge amount of data in the so-called databases and through special repositories for them due to the huge data that occupies a large storage capacity.

D-Networks:

Local and global, including LAN and WAN.

6- Human resource performance

1-6) detention of Human resource performance it is the interaction between achievement and behavior, that is, it is a set of measurable actions and results

The importance of determining the performance of human resources **(** (Nura, 2013, p. 295)

Most institutions seek to determine the quality and quantity of the performance of their employees and to determine the capabilities and capabilities that each employee possesses, and the extent to which an employee needs development and improvement. In view of the importance of human resources in organizations, it requires the preparation of a system to determine the level of performance of this precious resource, as the importance of determining the level of performance of human resources is represented in:

a- A continuous organizational process through which the performance of human resources is measured.

b- By determining the level of performance of its human resources, the organization can identify the strengths and weaknesses and their negative and positive repercussions on the effectiveness of the organization and the productivity of the subordinate.

c- Raising the morale of the employees, and that the main objective of determining the level of human resources performance is to address the weaknesses in their performance in the light of what the results of the performance evaluation show by creating an appropriate atmosphere of relations between the leader and the subordinate.

d- Contributes to revealing the untapped latent competencies of employees, useful in identifying the unstable sufficient energies and competencies, as well as the performance evaluation information provides information that is used to determine each of the training and later development needs of the individual and management to know the strengths and weaknesses of the institution

The researcher believes that the importance of determining performance is very important in the process of human resource development, as it maintains the good level of performance of the employee and keeps him within the competition cycle in good performance and stimulates the spirit of creativity and innovation in him, which leads to the achievement of the goals of the institution.

2-6) measuring and evaluating the performance of human resources criteria's

There are two types of criteria (elements, and performance ratings (adjectives such as sincerity and dedication to work)) Elements are of two types (Osman, 2011, pp. 41-48)

a- Concrete elements that can be easily measured by the individual, such as perseverance in work, and accuracy.

b- Intangible elements, which the evaluator finds difficult to measure, since they are one of the personal qualities of the individual. This requires continuous observation in order for the assessor to be able to notice them, such as honesty, intelligence, personality, cooperation ... etc., and by comparing his attributes and performance with them is measured.

7- Quantitative & Non-quantitative criterias

1-7)-Quantitative standards

Which can be measured in numbers and proportions, such as units of service and working hours [8].

2-7) -Non-quantitative standards

These are standards that cannot be measured in numbers and ratios, such as employee motivation and performance measurement models include key elements ((Rao, 2009, pp. 236-245)

a- The degree of knowledge of the work and its demands: What is meant is the degree of knowledge of the subordinates with the details of the work.

b- Production quantity: the extent of production quantity and its coverage of the employee's responsibility.

c- Production quality: It includes the extent to which the worker has mastered his work, working conditions, and the available capabilities.

d- Cooperation: It means the degree of cooperation between the worker and his contacts, whether they are from the organization or outside

The researcher believes that the main purpose of evaluating the performance of human resources is a developmental purpose that aims to use the results of the evaluation in order to develop human resources competencies, and to eliminate weaknesses in their performance, and thus improve performance and develop it continuously.

3-7) recent trends in human resource management:

(Dava Urlich), one of the most prominent human resources experts, believes that it is necessary for the administration to be interested in helping its human resources in achieving their goals and creating an effective and contemporary management that cannot be achieved with security through the application of several roles, which are as follows (Lucas, 1997)

a- Strategic management of human resources: It means the management's participation in the implementation of the strategy.

b- Managing change and transformation: It means that human resources play a major role in managing the change and transformation that occurs in the organization resulting from intense competition.

c- Infrastructure application management: It is intended to prepare an infrastructure for the institution of policies, procedures and rules that are well written and available to human resources.

d- Employee Contribution Management: It is intended to prepare appropriate policies and procedures to know the needs of human resources.

4-7) Performance indicators

They can be divided into four groups (Vrontis, 2022, p. 1235)

A. Indicators related to the effectiveness of achieving the objectives that the institutions are working on developing, and this set of indicators depends on the nature of the activity and objectives of each organizational unit.

B. Indicators related to the efficiency of using the resources used in each institution, as this group includes the ratio of the total costs to some specific outputs provided by the Agency. This mainly reflects the cost of the service provided by this device.

C. c- Indicators related to the productivity of enterprise units. Through the relative relationship between the outputs and inputs of those units.

D. d- This includes an analysis of the basic dimensions that make up the quality of service in general and the quality of government services in particular.

Where the use of the effectiveness and efficiency indicator is related to indicating the level of quality achieved in information management. Institutions, quality goals, and others, which makes quality control and its multiple dimensions the desired goals.

8-Practical side

The practical side of the research includes answering the following main hypothesis

There is a significant effect of information technology on human resource performance

The independent variable (information technology (x)) included three sub-variables (physical

Components (x_1) , software (x_2) and human components(x_3))

The dependent variable (human resource performance (y)) included two sub-variables (Efficiency (y_1) and Effectiveness (y_2))

The data was collected from the Research centers of the University of Baghdad, number of research centers is (8), and the number of research forms was (140).

9-Analysis of results

The following tables and figures represent the analysis of the results

Table (2) the correlation coefficient between (information technology &human resource performance)

Correlation type	Correlation sign	Correlation value	Correlation significant level

information technology	r_{x_1,x_2}	0.570**	.003
	r_{x_1,x_3}	0.409*	.042
	r_{x_2,x_3}	0.581**	.002
human resource performance	r_{y_1,y_2}	0.743*	.000
	r_{y_1,x_1}	0.664*	.000
	r_{y_1,x_2}	0.533*	.003
information technology & human resource performance	r_{y_1,x_3}	0.707	.000
	r_{y_2,x_1}	0.539*	.003
	r_{y_2,x_2}	0.606*	.000
	r_{y_2,x_3}	0.528*	.003

From Table (2) it becomes clear to us that there is a strong statistically significant relationship between the variables represented to information technology, because the value of most correlation coefficients is greater than (0.5) and that the positive correlations indicate a direct relationship between the variables represented to information technology

As for the value of the level of significance, which were all less than (0.05), it indicates the rejection of the following null hypothesis

$H_0: r_{x_i,x_j} = 0$
$\forall\ i \neq j$ and $i = 1,2,3$ $j = 1,2,3$
And

From Table (2) it becomes clear to us that there is a strong statistically significant relationship between the variables represented to human resource performance, because the value of all correlation coefficients is greater than (0.5) and that the positive correlations indicate a direct relationship between the variables represented to human resource performance

As for the value of the level of significance, which were all less than (0.05), it indicates the rejection of the following null hypothesis

$H_0: r_{y_i,y_j} = 0$
$\forall\ i \neq j$ and $i = 1,\ j = 2$

From Table (2) it becomes clear to us that there is a strong statistically significant relationship between the variables represented to information technology & human resource performance, because the value of all correlation coefficients is greater than (0.5) and that the positive correlations indicate a direct relationship between the variables represented to information technology& human resource performance

As for the value of the level of significance, which were all less than (0.05), it indicates the rejection of the following null hypothesis

$H_0: r_{y_i,x_j} = 0$
$i = 1,2,\ j = 1,2,3$

Each of the following models was formed
The first model
$y_1 = \beta_{10} + \beta_{11}x_1 + \beta_{12}x_2 + \beta_{13}x_3 + e_1$

With
y_1 represent the Efficiency
β_{10} represent the Efficiency when all (x_1, x_2 andx_3) equallto zero
β_{11} represent The value of changes in Efficiency when physical Components (x_1) changes one unit

β_{12} represent The value of changes in Efficiency when software (x_2) changes one unit
β_{13} represent The value of changes in Efficiency when human components (x_3) changes one unit
e_1 represent the effect of other factors

The second model

$$y_2 = \beta_{20} + \beta_{21}x_1 + \beta_{22}x_2 + \beta_{23}x_3 + e_2$$

With

y_2 represent the Effectiveness
β_{20} represent the Effectiveness when all (x_1, x_2 andx_3) equallto zero
β_{21} represent The value of changes in Effectiveness when physical Components (x_1) changes one unit
β_{22} represent The value of changes in Effectiveness when software (x_2) changes one unit
β_{23} represent The value of changes in Effectiveness when human components (x_3) changes one unit
e_2 represent the effect of other factors

The third model

$$y = \beta_{30} + \beta_{31}x_1 + \beta_{32}x_2 + \beta_{33}x_3 + e_3$$

With

y represent the human resource performance
β_{30} represent the human resource performance when all (x_1, x_2 andx_3) equallto zero
β_{31} represent The value of changes in human resource performance when physical Components (x_1) changes one unit
β_{32} represent The value of changes in human resource performance when software (x_2) changes one unit
β_{33} represent The value of changes in human resource performance when human components (x_3) changes one unit
e_3 represent the effect of other factors

The following table shows the effect of each of the variables of information technology on human resource performance

Table (3) the numerical results of three previous models

The model	R	F	Significant	The estimators			
				Estimator| notation	Estimator value	T	Significant
Model1	0.798	40.266	0.000708	β_{10}	2.333464	5.843172	0.000145
				β_{11}	0.249252	2.360301	0.019681
				β_{12}	0.768671	2.850341	0.039663
				β_{13}	0.480942	3.159824	0.045067
Model2	0.645	5.814	0.023327	β_{20}	2.986262	6.474846	0.000533
				β_{21}	0.342725	2.799506	0.020463
				β_{22}	1.602592	3.708083	0.040482
				β_{23}	1.258075	3.646592	0.045426
Model3	0.832	42.435	0.000912	β_{30}	2.929348	6.697823	0.000989
				β_{31}	1.097249	3.140349	0.020477
				β_{32}	1.185182	3.680158	0.039728
				β_{33}	0.585261	3.552705	0.04532

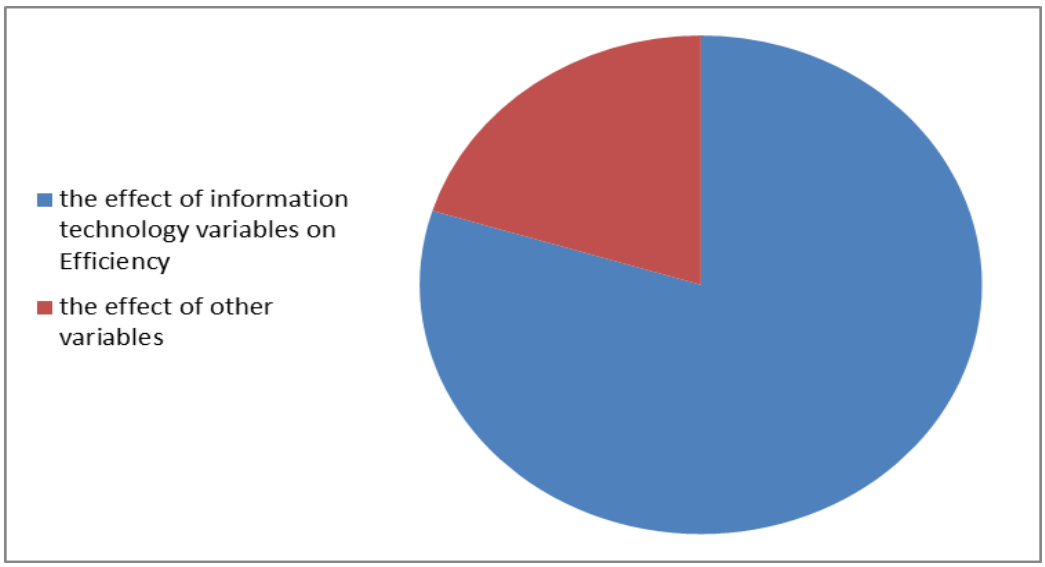

Figure (3) the effect of information technology variables on Efficiency

From Tableau (3) and figure (3) the (R) values show that the effect of information technology variables ($x_1, x_2\ and x_3$) on the variable Efficiency is (0.798)

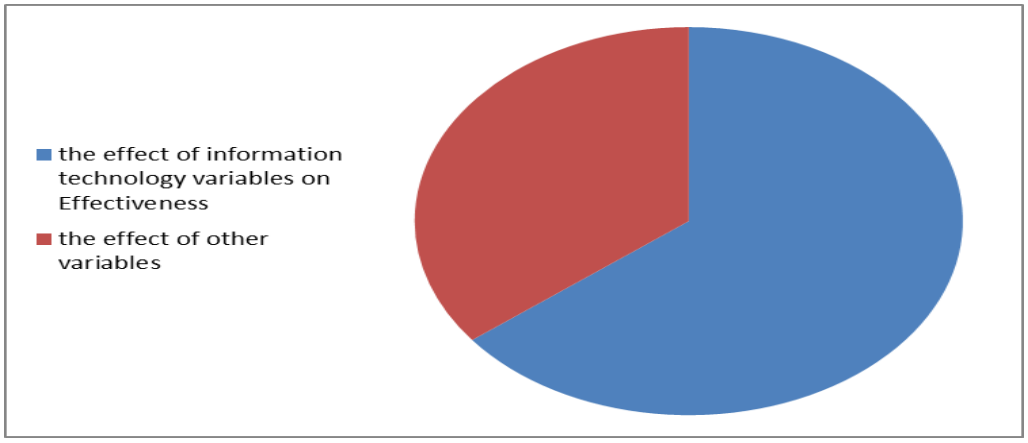

Figure (4) the effect of information technology variables on Effectiveness

From Tableau (3) and figure (4) the (R) values show that the effect of information technology variables ($x_1, x_2\ and x_3$) on the variable Effectiveness is (0.645)

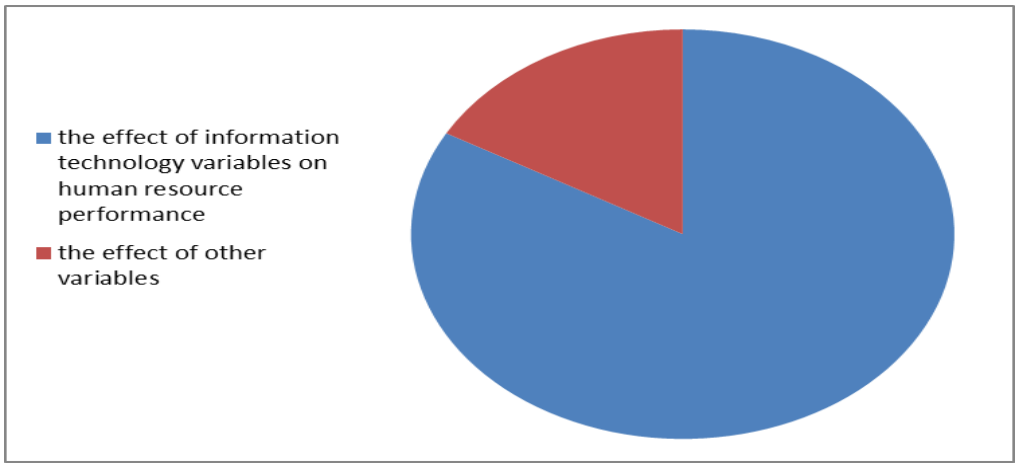

Figure (5): The effect of information technology variables on human resource performance

From Tableau (3) and figure (5) the (R) values show that the effect of information technology variables ($x_1, x_2\ and x_3$) on the variable human resource performance is (0.832).

The greatest effect is due to the third model.

From Table (3) the (Significant) values show that

All three models are valid for estimation and prediction because all values of (Significant) are less than (0.05).

The following hypotheses were rejected

$H_0 : \beta_{10} = \beta_{11} = \beta_{12} = \beta_{13} = 0$

$H_0 : \beta_{20} = \beta_{21} = \beta_{22} = \beta_{23} = 0$

$H_0 : \beta_{30} = \beta_{31} = \beta_{32} = \beta_{33} = 0$

From Tableau (3) the three estimated models will be

$y_1 = 2.333464 + 0.249252x_1 + 0.768671x_2 + 0.480942x_3$

$y_2 = 2.986262 + 0.342725x_1 + 1.602592x_2 + 1.258075x_3$

$$\boldsymbol{y = 2.929348 + 1.097249x_1 + 1.185182x_2 + 0.585261x_3}$$

10- Conclusions and recommendations

After the results came out, a number of conclusions and recommendations emerged

1- There is a strong relationship with statistical significance between all information technology variables and all human resource performance variables.
2- The strongest relationship is between (Efficiency and Effectiveness) Where the correlation coefficient is (0.743*)
3- The weakest relationship is between physical Components and human components Where the correlation coefficient is (0.409*)
4- There is a significant effect and statistical significance of information technology variables on the performance of human resources.
5- The relationship between information technology and performance efficiency can be studied
6- The impact of information technology on performance efficiency can be studied

References

Alami, R. a. (2015). The effectiveness of human resource management on improving the performance of education staf. International Journal of Business and Social Science, pp. 251-254.

Altınay, F. D. (2016). The role of information technology in becoming learning organization. . Procedia Computer Science, pp. 663-667.

Aral, S. B. (2012). Three-way complementarities: Performance pay,human resource analytics, and information technology. Management Science. is journal article is available at ScholarlyCommons:, pp. 913-931.

Choi, S. Y. (2010). The impact of information technology and transactive memory systems on knowledge sharing, application, and team performance: A field study. MIS quarterl. JOURNAL ARTICLE, pp. 855-870.

Lucas, H. C. (1997). Information technology for management.

Mishra, A. &. (2010). Information technology in human resource management: An empirical assessment. Public Personnel Management. journals.sagepub, pp. 271-290.

Nura, A. A. (2013). Gauging the effect of performance management and technology based human resource management on employee retention: The perspective of academics in higher educational institutions in Sokoto State Nigeria. Asian Social Sc, p. 295.

Osman, I. H.-4. (2011). The relationship between human resource practices and firm performance: an empirical assessment of firms in Malaysia. . Business Strategy Series, pp. 41-48.

Rao, P. S.-3. (2009). Personnel and human resource management . Himalaya Publishing House, pp. 236-245.

Sanin, A. &. (2021). Performance of supply chain management and digitalization of human resource information in SMEs. Uncertain Supply Chain Management. pp. 277-282.

Vrontis, D. e. (2022). Artificial intelligence, robotics, advanced technologies and human resource management: a systematic review. The International Journal of Human Resource Management, 3, pp. 1237-1266.