THE USE OF INFORMATION TECHNOLOGY IN IMPROVING MUNICIPAL PERFORMANCE _ CASE STUDY IN A NUMBER OF MUNICIPAL DIRECTORATES IN THE MUNICIPALITY OF BAGHDAD

Noor Basil Hameed[1] , Ali Mawat Al,Sudany[2]
Baghdad University, Faculty of Management and Economics[1]

An assistant Professor in strategic management at the University of Baghdad, Business management department, consultancy bureau manager[2]

ABSTRACT

This research sought to diagnose the role of IT using GPS in improving municipal performance. To achieve this, the elements and components of information technology (hardware, software, databases, communications networks, human resources) were adopted as an independent variable and dimensions of performance measurement (internal processes, growth and learning, financial dimension) dependent variable, and the standard checklist was adopted as the main measurement tool in This search, the members of the research sample were selected at the level of senior and middle leaders, where the total number of (44) employees, and for analysis and processing of data and information, and test research hypotheses, has been used statistical analysis program (SPSS V 23), (Amos v 23), and the adoption Descriptive Statistics Methods , (Arithmetic mean, standard deviation), the results showed the important role of information technology by using GPS to improve municipal performance.

Keywords: Information Technology, Global Position System GPS, Learning and growth, Internal processes, municipal performance.

INTRODUCTION

The world today is witnessing a new reality characterized by dynamic and rapid scientific and technological change, especially the revolution of information and modern communications, which led to increased attention to the methods and methods adopted by the organizations and the development of new working methods that enable them to adapt to new technology, including service organizations, especially the municipal sector, and out of the importance of using technologies Modern means and their direct relationship with the performance of municipal departments on the one hand, and the importance of the municipal role played by those departments on the other, and to ensure the central

490

control and continuous control in the completion of these works Reducing time, reducing human and automated effort,

eliminating time and space constraints and obtaining the required services in easier and faster ways at reduced costs, the Global Positioning System (GPS) technology was used as a system to track the specialized service mechanisms of the municipal departments, and their activities such as (cleaning, roads, sewage, water, agriculture), as the tracking devices were linked in their own and leased mechanisms and activated and followed up centrally by the competent authorities.

- **Information Technology**

All forms of technology used to create, store, exchange and use information in its various forms (business data, voice conversations, still and animated images, multimedia presentations) and other formats.**(Schultz,2006:5),** It also describes it **(Wallace, 2015: 11,12)** as one of the four components of the information system (individuals, technology, data, processes) and includes hardware, software, networks, communications, all desktop and laptop computers, tablets, navigation devices, digital cameras, scanners and sensors.

- **Global Position System GPS**

It is a wireless radio system used for global positioning, usually called Global Position System (GPS), referred to by the US military as (NAVSTAR GPS), and is a satellite navigation system, used to accurately locate a person and provides a very accurate time reference anywhere in Earth orbit, and uses a circular orbital constellation (ICO) of at least 24 satellites, which supports it, and is shared around the world. The Global Positioning System (GPS) is a constellation of low-Earth orbit Continuously into terrestrial receptors, the system provides coded information to GPS receivers, allowing the receiver to accurately calculate the current time, location and speed, and can convert the user's latitude and longitude into electronic maps.

(Mcnamee,2005: 65) (Shaakir,2006:1) (Rainer&Cegielski,2011:246)

The Dimensions of information Technology

- **Hardware:**

Computers are defined as physical equipment used for input, processing, and output activities in an information system. **(Laudon&Laudon,2014:51)**

- **Software**:

Software is the generic term for a myriad of programs used to operate and process computers and their peripherals or to perform a specific task using a computer as a means. One common way to describe hardware and software is to say that software can be considered the variable part of a computer and hardware as a fixed part.

)   Markas & O'Brien, 2013:135(

- **database**

database is an integrated collection of logically related data elements. database consolidates records previously stored in separate files into a common pool of data elements that provides data for many applications. The data stored in a database are independent of the application programs using them and of the type of storage devices on which they are stored. **(O'Brien&Markas,2010:173-174)**

- **Communication networks**

consisting of both physical devices and software, links the various pieces of hardware and transfers data from one physical location to another. Computers and communications equipment can be connected in networks for sharing voice, data, images, sound, and video. a network links two or

491

more computers to share data or resources, such as a **2018: 49) (Laudon & Laudon ,**printer.

- **Human Resources**

These include technical and managerial skills of IS employees, such as programming, systems analysis, network administration database management, project management, co-ordination and leadership ,interaction with use community and effective management of IS. These skills are highly firm specific and difficult to imitate - hence they serve as a source of competitive advantage. **(sirbel,2012,17,18)**

- **Municipal performance**

is defined as the organization's ability to attain its goals by using resources in an efficient and effective manner**. (Daft & Marcic ,2017:12)**, the accumulated results of all the organization's work activities. It's a multifaceted concept, but managers need to understand the factors that contribute to organizational performance.**(Robbins&Coulter,2018:601)**

The Dimensions of Municipal performance:

A. The internal business processes

This perspective identifies the processes that create and deliver to the customer a value proposition. These processes should ensure that the firm's products and services are meeting customer needs, and is considered the most critical for the success of an organization. Some key performance indicators are process improvement and cooperation with suppliers. Khan& Halabi (2009) Kaplan and Norton (1996), also the key measures of this perspective include product design, product development, post sales services, and manufacturing efficiency. Hoque and James (2000). **(Rahhal &Darabee,2014 : 194),** A strong, adaptive corporate culture and positive work climate , operational efficiency, such as using minimal resources to achieve outcomes , undistorted horizontal and vertical communication , Growth and development of employees. **(Daft,2008 :77)**

B. Learning and Growth Perspective

The learning and growth perspective determines the infrastructure that an organization must build to create long-term growth and improvement. Customer perspectives and internal process determine the most important factors for current and future success. Companies are unlikely to be able to achieve their long-term goals for customers and internal processes using current technologies and capabilities. Also, intense global competition requires that companies continually improve their capabilities to deliver value to customers and shareholders. Organizational learning and growth come from three main sources: people, systems, and organizational procedures. **(Kaplan&Atkinson,1998: 374**) This perspective focuses on innovation, creativity, competence, and capability. It also focuses on people—their attitude, culture, knowledge, development, etc., and their ability to learn and grow for managing and sustaining change and improvement. The learning and growth perspective, thus, emphasizes employee training and building a corporate culture that facilitates individual self-improvement and corporate development and growth. An organization must provide funds for the training and development of employees and managers should ensure that they pay adequate attention to employees' learning and development. **(Pandey,2005 : 56)**

C. RESEARCH METHOLOGY

a) **Search problem**

The problem of the current search for verification of the availability of information technology components is based on the application of GPS (vehicle tracking) in the departments of municipal departments in the Municipality of Baghdad, and reflected in the performance of those departments for the purpose of improving the status of municipal services provided to citizens.

Based on the above, the research problem can be summarized by the following questions:

492

1. What are the locations of the use of information technology in the municipal departments that apply GPS in the Municipality of Baghdad?

2. Is there a relationship between information technology using GPS and municipal performance?

3. What is the level and nature of the relationship related to the application of information technology based on GPS and employment ranges to improve municipal performance?

4. Is there a relationship between the components and the elements of information technology in the municipalities studied and their municipal performance?

b) Research Hypotheses

In order to achieve the objectives of the research and based on the nature of the problem and variables, the hypotheses of the research based on the hypothesis chart of the research, which represents the relationship of correlation and influence between the research variables and the following:

H1: There is a significant correlation between the dimensions and components of information technology and municipal performance in the municipal departments.

H2: There is a significant impact relationship of the dimensions and components of information technology in the municipal performance of the municipalities studied.

c) Research Sample and community

The research community included the selection of municipal departments, which is one of the formations of the Municipality of Baghdad and the number (15) distribute within the geographical area of the city of Baghdad and according to the specific area of each, where (8) located on the side of Rusafa and (7) on the side of Karkh, the selected samples were characterized by accuracy and comprehensiveness in the representation of the research community fully, which constituted (27%) of the total municipal departments, and two municipal departments were selected on each side for a total of four municipal departments (Al-Adhamiya Municipality, Sadr First Municipality) in the side of Rusafa and (Holy Kadhimiya Municipality, Mansour Municipality) in the side of Karkh, The members of the research sample were selected at the level of senior and middle leaders and are experts, as they have expertise and competence in the field of municipal work, where the total number of (44) employees, distributed by (11) employees for each municipality researched.

d) Measurement

For the purpose of extracting the research variables, the researcher relied on measures obtained from the use of a set of international indicators related to the research problem, which fall under a set of main axes for both the independent variable (information technology) and the dependent variable (municipal performance), as shown in table (1). It was used as much as possible to suit the environment in which it was prepared and built on the basis of Arab and international sources, as well as other views of a group of writers and researcher, the 7-Likert scale was adopted in the sample responses to the checklist, which falls according to the answers (not applicable at all 1, somewhat not applied 2, not applied 3, neutral 4, applied) (5), applied to some extent (6), fully implemented (7)), and contains each of the main themes of the checklist, he researcher adopted the results of the stability test through the correlation coefficient (Alpha Cronbach), as shown in Table (2), which confirmed the internal consistency of the paragraphs of the scale at all dimensions after the values of correlation coefficients (Alpha Cronbach) exceeded the minimum acceptable (0.70) and including Confirms the internal consistency of the

493

scale and therefore the required stability in case of
repeated testing.

Table 1: Variables, sub Variable, the number of paragraphs, their numbers in the checklist , the source adopted in the Sale

Variables	Sub variable	No of items	Source
Information Technology	Hardware	5	(O'Brien &Marakas,2010 : 73) (Marakas &O'Brien,2013 : 81)
	Softwares	7	
	Database	7	
	Communication Networks	6	
	Human Resources	4	(Van Grembergen &De Haes ,2009:145) (Reynolds,2016 :4)
Municipal performance	The internal business processes	6	(Kaplan &Norton ,1996:12)
	Learning and Growth Perspective	7	

Table 2: The value of the stability coefficient (alpha-Cronbach)

The Questionnaire Axes	value alpha-cronbach
Information Technology	0.913
Municipal performance	0.922
All axles	0.931

Table 3: shows the results of the statistical analysis of responses sample

	Variables & Sub variable	Mean	Std. Deviation
Al-Adhamiya Municipality	Information Technology		
	Hardware	6	0.704
	Softwares	5.520	0.729
	Database	5.818	0.813
	Communication Networks	5.546	1.148

	Human Resources	6.136	0.745
	Municipal performance		
	The internal business processes	5.727	0.932
	Learning and Growth Perspective	6.078	0.879
	Variables & Sub variable	Mean	Std. Deviation
	Information Technology		
	Hardware	6.546	0.507
	Softwares	5.805	0.597
	Database	6.234	0.704
	Communication Networks	5.97	0.493
	Human Resources	5.932	0.623
Sadr First Municipality	Municipal performance		
	The internal business processes	5.727	0.569
	Learning and Growth Perspective	5.818	0.542
	Variables & Sub variable	Mean	Std. Deviation
	Information Technology		
	Hardware	5.946	0.886
	Softwares	5.701	0.594
Holy Kadhimiya Municipality	Database	5.974	0.928
	Communication Networks	5.288	0.91
	Human Resources	5.909	0.692
	Municipal performance		
	The internal business processes	5.5	0.532
	Learning and Growth Perspective	5.61	0.495
Mansour Municip	Variables & Sub variable	Mean	Std. Deviation
	Information Technology		

Hardware	6.218	0.695
Softwares	5.714	0.469
Database	5.961	0.676
Communication Networks	5.379	0.435
Human Resources	6.182	0.489
Municipal performance		
The internal business processes	5.303	0.208
Learning and Growth Perspective	5.312	0.382

Correlations of variables

Table (4) shows that the correlation coefficient between information technology and municipal performance was (0.581 **) at the level of (0.000) which is less than the level of (0.05), which means rejecting the null hypothesis and accepting the alternative hypothesis which states (there are There is a significant correlation between information technology and municipal performance).

Table (4) Correlations of variables

Information Technology (X)		**Correlation value and significance level**	
Hardware	**Municipal performance(Y)**	**Correlation value**	**0.372***
		sig	**0.013**
Software		**Correlation value**	**0.564****
		sig	**0.000**
Database		**Correlation value**	**0.419****
		sig	**0.005**
Communication networks		**Correlation value**	**0.655****
		sig	**0.000**
Human Resources		**Correlation value**	**0.529****
		Sig	**0.000**
Information Technology		**Correlation value**	**0.581****
		Sig	**0.000**
Correlation is significant at the 0.01 level (2-tailed).**			
Correlation is significant at the 0.05 level (2-tailed).*			

Table (5) Results of the regression of variables

496

The value of (F) calculated among information technology in municipal performance is (21.428), which is greater than the tabular value (F) of (3.94) at the level of (0.05) and therefore we reject the null hypothesis and accept the alternative hypothesis which states (there is a significant effect) The significance of information technology in the municipal performance (at the level of significance (5%) or a confidence level (95%), and through the value of the coefficient of determination (R²) of (0.338) shows that information technology explains the rate (33%) of the variables that occur in Municipal performance, indicated by the value of the marginal slope coefficient (47) of (0.547) that the increase of information technology by one unit will lead to increase Municipal performance by (54%).

Table (5) Results of the regression of variables

Information Technology (X)		Fixed limit A	Regression parameter Beta	Value (F) calculated	Selection factor (R2)
Hardware	Municipal performance(Y)	3.793	0.298	6.737	0.138
Software		2.485	0.554	19.573	0.318
Database		3.744	0.315	8.943	0.176
Communication networks		3.053	0.465	31.477	0.428
Human Resources		2.698	0.486	16.326	0.280
Information Technology		2.416	0.547	21.428	0.338
The value of the tabular F =3.94					

e) Results

- There is a significant correlation between the components and elements of information technology and municipal performance, as each positive change in information technology is directly offset by a similar change in municipal performance.
- There is a significant influence relationship to the elements and components of information technology in municipal performance, as any increase in information technology leads to a direct increase in municipal performance by a certain amount.
- The dimension of software is one of the most influential dimensions in the performance of municipal departments, compared to other dimensions.

f) Resources

1. Schuitz ,Robert A, (2006) **Contemporary issues in Ethics and information Technology** , IRM Press.
2. Wallace, Patrica ,(2015), **Introduction to Information Systems** ,2ed, pearson education ,Inc, New Jersey.
3. Mcnamee,A,(2005),**Ethical Issues arising from the Real Time Tracking and Monitoring of People Using GPS-based Location Services**, Honours Thesses, Faculty of Engineering &

Information Sciences, University of Wollongong.

4. Shaakir,Qais Khaleel,(2006) ,**Investigation, Design, and Simulation of Microstrip Antenna for GPS Applications** ,Thesis Master in Electrical and Electronic Engineering /Al-Rasheed Collage of Engineering and Science,University of Technology .

5. Rainer , Kelly R & Cegielski , Casey G ,(2011) , **Introduction to Information systems : supporting and Transforming Business** ,3 ed , John Wiley & Sons , Inc.

6. Laudon, Kenneth C & Laudon, Jane P, (2014) , **Management information systems: managing the digital firm**, 13 th ed , person Edu,Inc,New York.

7. Markas,George M & OBrien' , James A,(2013) ,**Introduction to information systems** ,16 th ed ,McGraw-Hill, Irwin.

8. O'brien , James A & Marakas, George M,(2010) , **Introduction to Information Systems**, 15 th ed ,Mc Graw-Hill.

9. Laudon, Kenneth C & Laudon, Jane P, (2018) , **Management information systems: managing the digital firm**, 15 th ed , person Edu,Inc,New York.

10. Sirbel, M., (2012). **The Effect of Information Technology (IT) Capabilities and Customer Relationship Management (CRM) on Marketing Performance: An Empirical Study on Commercial Jordanian Banks in Amman**. Middle East University.

11. Daft , L. Richard & Marcic ,Dorothy , (2017), **Understanding**

12. Robbins , Stephan P & Coulter, Mary , (2018) , **Management** , 14 ed, Pearson Education, Inc , New York, NY.

13. Rahhal, Akram, & Darabee, Tariq, (2014). **Adoption of Balanced Scorecard (BSC) in Palestinian Corporations**, 2 (5), pp. 193-203.

14. Daft, Richard L, (2008). **Organization theory and design**, 10 th ed , Cengage learning.

15. Kaplan, Robert S & Atkinson ,Anthony A,(1998) , **Advanced management accounting ,** 3ed, Prentice Hall.

16. Pandey, I. M. (2005). **Balanced scorecard: Myth and Reality.** Vikalpa, 30(1), 51-66.

17. Van Grembergen ,Wim ,De Haes, Steven ,(2009) ,**Enterprise Governance of information Technology: Achieving Strategic Alignment and Value** ,Springer Science &Business Media.

18. Reynolds, George W ,(2016) , **Information Technology for Managers** , 2 ed , cengage learning ,USA.

19. Norton, D. P., & Kaplan, R. (1996). **The Balanced Scorecard: translating strategy into action**. Institute for International Research.

Management , 10 th ed , Cengage learning.