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Decision Support Systems Effect on Reengineering Field Research on Jordanian Tourism Companies

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Abstract

This research aimed to recognize the cause and effect of decision support system on reengineering the Jordanian tourism companies .In order to achieve the research aims , researcher developed a questionnaire and distributed it to a 43-individual sample randomly. The research results in that the extent of interest in decision support systems and reengineering work systems doesn't get that high , and clearly there was a cause and effect relationship between decision support systems and reengineering work systems . This research recommended increasing the interest in decision support systems and generating full consciousness of the staff in the principles and stages of reengineering work systems.

Key words: Decision Support Systems (DSS) , Reengineering .

Introduction

The hasty changes and challenges in business organizations environment made them compete to adapt and search for any new creation of administrative entrances that fulfill efficiency and adequacy to support their existence and continuity . This is not going to happen unless organizations' administrations get over traditional styles and concepts, and construct administrative entrances and new applications which will be a clear identity for these organizations and make them distinguished . Perhaps one of those revolutionary entrances is the work systems reengineering entrance .

This entrance is based on the radical and rapid redesigning , and adding value to the administrative and organizational operations , policies and structures through the best support for work flow and productivity in the organization. This requires the availability of both quantity and quality suitable information and the appropriate cost and timing , so the decision support systems are considered , in this case, the power of suitable support for the success of the re-engineering systems work .

The Jordanian tourism companies are considered to be one of the organizations that have faced and are still facing a huge change in its own environment , which requires that you reconsider the existed means and methods concerning the work to conform to the environment and invest what information technology produced like support decision to complete the reengineering systems work properly.

Research Problem

Difficult regional conditions affected the Jordanian tourism companies whether they were political , economic or concerning security. If these companies wanted to survive and grow, they had to reconsider all of their activities and events, and their methods of management and organizational structures as well . This will be done only through the presence of support decision system which is able to provide information properly in form, size and timing necessary to deal with the vast amount of diverse data. Therefore, the current research is trying to answer the following questions:

1 .Is a support system decision efficiently and effectively available in the tourism companies of Jordan ?

2 .Is there a clear perception among managers in these companies about the stages of reengineering ?

3 .What is the nature and type of correlation and impact between the decision support system and the stages of reengineering ?

The importance of research

The Jordanian tourism companies are one of the important interfaces to the outside world ; the more well done performance they reflected the more civilized Jordan is and affected the Jordanian economy, by inserting foreign currencies which will reflect positively on the national economy. So the search gets its importance from dealing with a field of great importance, and the well planned variables of decision support systems and re-engineering work systems are considered one of the modern administrative variables, which if used properly led to the success of organizations.

Research Objectives

The research aims to identify the degree of availability of basic suitable characteristics for decision support systems in the companies studied in this research, and the diagnosis of the degree of interest in the stages of re-engineering . It also aims to study the relationship and effect between these two variables and provide a number of recommendations serve the tourism sector in Jordan.

Research hypotheses

The first hypothesis: There is a significant correlation between the decision support systems and administrative process reengineering .

The second hypothesis: There is a significant moral effect of decision support systems in the administrative process reengineering.

Society and study sample

Research has focused on Jordanian tourism companies category (A) ,and they are (31) companies. A random sample of (25) companies, representing 80% of the overall community was pulled . (50) questionnaires on (Director, Deputy Director or Assistant Director) were distributed , (45) questionnaires have been returned , (2) questionnaires were excluded, and the analysis was performed on the(43) questionnaires.

Search Tools

The theoretical side of the research has been crystallized through books of literature related to the research variables . As far as the field side of the search is concerned , a questionnaire has been designed based on the views of a group of researchers and writers about the research topic to get the raw data . The questionnaire included questions with multiple choice. The first section, which was about decision support systems, had four major dimensions (simplicity , ease of control , flexibility , and ease of communication) , and had (20) paragraphs distributed evenly over the four dimensions .The second section included five dimensions represent the stages of re- engineering e.g. (planning , determination , vision , solution , and application).

Statistical tools used

A number of appropriate statistical tools has been used to test the research hypotheses, as follows :

1. Rank correlation coefficient (SPEARMAN) to measure the type and degree of the relationship between the variables .
2. Simple regression coefficient is a parametric method to measure the impact of an explanatory variable in the responder variable .
3. Test (F) to test the moral equation of simple linear regression .
4. Test (T) to test the significance of the correlation coefficient and moral decline

The theoretical side

First: the concept of decision support systems

Despite of the passage of decades on the emergence of decision support systems, there is a difference in identifying this concept among writers and researchers. (Power, 2005, 3) pointed out that the decision support systems are a broad category of information systems that supports and guideds the decision-maker In order to speed up and improve communication processes and decision-making, It works to assist the director in making tactical decisions and provides support in three areas (data collection, models analysis, and results). (Post & Anderson, 2000, 342) and (Gupta, 2000, 274) see them as a set of interactive software that provides the manager with data, tools and models for the purpose of decision-making. The researcher sees that the decision support system is an interactive system employs a computer in the process of data collection, analysis , representation and presented to the beneficiary (director) in order to make decisions with diverse structures.

This leads us to classify decisions, as reflected in the administrative literature, into two classes (Haag et al, 2007, 182) : **First:structured decisions:**they are the taken decisions to treat the problems of routine. Here, do not psychological and emotional aspects interfere in decision-making, because this kind of decisions can be programmed using input and specific treatments.

The second decision is unstructured decisions that bear several solutions and there is no specific method to get to the correct answer, it is not followed always, and the decision maker can use different criteria each time choosing the perfect alternative.

Justifications, characteristics and roles of decision support systems

(Truong & Azadivar, 2005, 2107) have pointed out that the justifications for the existence of decision support systems are because the computer began heading toward the user, instead of moving the user toward the computer and appropriateness so that they can design the system that decision-maker wants to, it also changes interest of seeking to enhance the efficiency of the process of making the decision to seek to improve the effectiveness of the decision-making process and expanding the reach of rational limited decision-maker of the computer, and; finally, the high flexibility in the use of information technology.

(Truong & Azadivar, 2005, 2107) have identified the main roles of decision support systems in the following :

First: the user of the decision support systems or the decision-makers who get the support required or expected of the decision support systems for decision-making .

Second: the role of the mediator who mediates between the beneficiary and the support systems decisions (adviser or assistant) .

Third: the constructive role which represented in the recruitment advertising available in the generators to build special applications.

Fourth: the role of the rich assistant who works on the proposals necessary to make adjustments or improvements to decision support systems **.**

Finally: the role of innovator who created a new technology or new languages or new software sets.

There was a common denominator among many writers and researchers that the tools of decision support systems consist of four tools :

First: data warehouses which is a response to the failure of information technology in creating integration between data distributed in different processes systems which are used in the organization , and form an ideal environment to take advantage from these data in analytical processes and support decision in various administrative levels (Ralph, 2003, 1), and levels of data aims to improve data quality through consistency , durability , accuracy and documentation (Yuan, 2004, 6) , and to achieve the integration of the sub-units of the organization (Goldberg, 2004.2) and to store data for a long time and adjust the response time (Walter & Goldenstein, 2004,4)

The second tools is the exploration data tool which is an analytical process designed to convert data into business information that can be used to improve the performance and profitability of the organization through the construction of mathematical models to help organizations make better decisions (Saarenvirla, 2001, 1) and those who are in charge of the strategic and continuous exploration (Ramachandran, 2001 0.2) two types of data mining can be determined, namely the exploratory analysis which is an understanding of the data set to form reasonable and new models and predictive Analysis which is a link between what is known and what is unknown . At that level it is to predict the value of output in the future depending on the examples of the past (Ahola & Esa, 2001.3).

And the third tool of analytical processors is On line Analytic Processes which is a technique linked strongly with data warehouses and has been used synonymously with it , the concept of

data warehouses became common by machine of successful database (Computers store database) and that have the ability to store such a large amount of data (Sean, 2001, 9) .

The fourth tool is the technologies associated with the internet . The Internet has become a global network hub for the activities of the development of decision support systems, the software companies offer information to support the decision or tools for supporting decision of the beneficiaries using a web browser like internet explorer as it is linked to a computer (a server that contains DSS applications with a user's computer via the network subject to clear agreements (PROTOCOLS) and valid (Schim tet al, 200, 62).

Second: the concept of business re-engineering

business re-engineering is the initial and basic re-thinking and redesigning of administrative processes radically in order to achieve high substantial improvements which are not marginal or incremental in performance standards (Hammer & Champy, 1995, 31), something which must be faced by all organizations when they are serious in their attempts to meet the needs of its customers in a competitive way and to achieve profitability goes with the requirements of the next time (Paul & Copedes, 1995) (Hoff ,2000, 33) pointed out that he messed the re-design of a radical and rapid processes of strategic interest and the target is making leaps achieve strategic benefit even achieve a dramatically leap in performance with a redesign of processes and everything associated with the procedures , rules and regulations of the company. Depending on the above, Researcher finds business re-engineering a model of a new management to rebuild the organization based on the principle of re-thinking what is existed for this construction in order to bring radical changes to the level of strategic operations of the organization through the provision of the success factors necessary to achieve fast and efficient response to meet the requirements of different environmental changes in order to reinforce the effectiveness of the organization.

Stages of business re-engineering and requirements

The researchers emphasize that the process of change in general is supposed to be fulfilled through several stages, so the task of identifying the process of change and then the order of succession of these stages to achieve harmony with each other down to the goals of the process of change is one of the most complicated and important tasks which attributed to a set of reasons : first of these reasons is the length of the change and the necessary supplies to hold them and the problems arising from them . Its importance is linked to resulted consequences of the process of change. in spite of differences in the views of researchers regarding these stages, there is a common ground gathered most researchers around these stages, which will be adopted in this research , as follows :

1 .The planning stage : at this stage, a sense of the problem appears and shows the need for re-engineering because of the environmental changes and what come out of the opportunities and threats in the external environment and the strength points and weaknesses in the internal environment .

2 .Selection stage : at this stage, existed and potential customers of the company are identified and the performance of the company is measured for the purpose of meeting

the needs and desires of customers as well as determination of the nature and elements of the company i.e. workers and products and activities which will be done.

4 . Stage of future vision , at this stage, they are going to put the vision in determining the qualities , characteristics and objectives for measurable future operations . This stage connects the company's strategy with the performance of the business, and identifies opportunities and restricts them and how to use them . It identifies the important performance measures in making a comparison with the performance of processes (Daveuport, 1993, 118)

5 . The solution stage , and this stage includes technical solutions from which the technical and social dimensions of the new processes to be re- engineered are determined (Klein, 1993, 40).

6 . Application stage , at this stage , the implementation of plans , testing new designs , evaluating the performance of individual workers in terms of their competence and their abilities to take responsibility are done (Klein, 1993, 41)

As far as the special requirements for re-engineering and its success factors is concerned, there are necessary requirements and factors must be considered when applying re-engineering and they vary from a company to another according to their nature of growth and the degree of reliability. (Saunter, 1997, 304, Wheelon & Hunger, 2000, 197) have agreed on a number of requirements:

First: organizing activities according to outputs and not on the basis of tasks
Second: the participation of workers in decision-making
Third: putting the right person in the right place
Finally : the final results must be in the hands of the high management.

The relationship between decision support systems and re- engineering

The success of administrative organizations depends on the availability of the delicate information . The success of organizations also needs organized Information which can be used by the administration and benefited from. The ability of organizations to provide the necessary and fast information is a prerequisite to direct decision-making processes. Decisions related to re- engineering work systems must get the highest degree of attention because their failure means that the organization's ability to survive and continue is over. Decision support systems are important tools to improve the decision -making strategy , for example , the work systems re- engineering decision

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Previous studies

Ahmad, Francis & Zairi (2007) study aimed to examine the critical factors in the success of the administrative process reengineering in Higher Education. An experimental study by examining the three institutes of higher education in Malaysia adopted the application of administrative process reengineering. The study found that there are several important and critical factors in the success of the administrative process reengineering:

a team spirit, quality education, qualitative system administration, satisfying reward system, active change and participatory management, information technology and active management of the projects, and the efficiency of financial resources.

(Tennant, 2005) study aimed to identify the key factors of the success of applications of Administrative Process Reengineering in the UK companies that have used this approach . The study found that the reasons for the use of administrative process reengineering are the external competition, the desire of reducing the internal cost and the improvement of products . The use of short-term plans is one of the leading obstacles to apply the systematic administrative process reengineering.

(Mihyar Hesson & Hayder AL-Ameed, 2007) study focused on identifying the steps involved in the planning of the city, prepared by staff and existing buildings and roads electronically, after the use of the style of administrative process reengineering. The study concluded to reduce costs related to planning, time , and the human resources required.

(Misdolea, 2010) study aimed to analyze the role of information systems represented in decision support systems and their components to strengthen the relationship with customers. The study sample consisted of 33 companies operating in the software industry in France. The most prominent results show that decision support systems enhance the relationship with corporate clients because of the role of these systems in transferring requests and needs of customers.

(Steiger & Steiger, 2007) study aimed to clarify the role of the decision support system . The sample which consisted of (82) directors working in the information technology sector in Singapore has proven that the decision support system has a role in improving decisions .

(Misdolea, 2010) study aimed to analyze the role of information systems represented in decision support systems and their components to strengthen the relationship with the customer. The sample consisted of 339 companies operating in the software industry in France. The study found that decision support systems have a role in strengthening the relationship with the company's customers, since these systems provide the company's requests and needs of customers.

Practical framework

the dimensions of decision support systems

The data listed in Table (1) points out that the general average of all the paragraphs is identical with supposed average by (3) .The dimensions of simplicity and control is higher than the average, while the dimensions of flexibility and communication were lower than the supposed average.

Table (1)
Mathematical means to push decision support systems

DSS	Average	Deviation
Simplicity	3.1	0.1
Control	3.2	0.2
Flexibility	2.8	(0.2)
Communication	2.9	(0.1)
General average	3	

the stages of re-engineering

Data listed in Table (2) shows that the general average was lower than the supposed average by (3) and that is because there are three paragraphs averages less than (3), and it is the stage of the vision, solution, and application.

Table(2)
Mathematical means to push stages of Re- engineering

Stages Re- engineering	Average	Deviation
Planning	3.4	0.48
Determent	3.2	0.28
Vision	2.8	(0.12)
Solution	2.7	(0.22)
Application	2.7	(0.22)
General Average	2.92	

testing the cause and effect among the variables of search

The relationship between the variables of decision support systems and variables of administrative reengineering appears in table number (3). Table (3) shows the results of measuring the simple and multiple correlation betweens variables of decision support systems and variables of administrative re- engineering on the general level of the sample . The results indicate the presence of a statistically significant moral and positive relationship between decision support systems and administrative process reengineering , thus correlation coefficient at total level of the sample was (0.72) which is a positive value indicating that there is a moral positive relationship at a significantly level (0.01) and the results of the variables of decision support systems and variables process Reengineering were as the following :

1 .There is a positive significant moral correlation (0.01) between the sub-decision support systems variable- (simple)- and all the administrative sub-process reengineering variables, and it was with the planning (0.36) and specificity (0.49) and vision (0.53) and the solution (0.63) and the application (0.36)
2 .There is a positive significant moral correlation (0.01) between the variable sub-decision support systems (control) and all the decisions of the administrative process reengineering which reached with planning (0.43) and specificity (0.53) and vision (0.41) and the solution (0.63) and the application (0.36)
3 .There is a positive significant moral correlation (0.01) between the sub- decision support systems variable (flexibility), and all the sub- process reengineering variables, and it was with the Planning (0.52) and specificity (0.66) and vision (0.67) and the solution (0.47) and the application (0.44)

4 .There is a positive significant moral correlation (0.02) between the sub- decision support systems variable (contact) and all the sub- process reengineering variables , reaching with planning (0.38) and specificity (0.47) and vision (0.42) and the solution (0.54) and the application (0.26)
5 .Depending on the above, the main hypothesis of the research is the first to accept and state that (there is a significant correlation between moral decision support systems and administrative process reengineering) .

Table(3)

Values of correlation Coefficients (spearman) between decision support systems and process reengineering

Variables reengineering / Variables dss	Planning	Determent	Vision	Solution	Application	Sig	Impressive total
Simplicity	0.36	0.49	0.53	0.63	0.36	0.00	0.53
Control	0.43	0.53	0.41	0.56	0.33	0.00	0.58
Flexibility	0.52	0.66	0.67	0.47	0.44	0.00	0.65
Communication	0.38	0.47	0.42	0.54	0.26	0.02	0.42
The level of the moral and effective impressive total						0.00	0.72

The effect of decision support systems in administrative process reengineering

Table No. (4) points to the effect of decision support systems variables on the administrative process reengineering since the results were as the following :

1. The coefficient of determination (R2) Indicates that the proportion of explained difference in the administrative process reengineering is due to the effect of decision support systems variables which will not be less than (0.76) and it is a good percentage. The value (F) is (64.27) which is the value of a moral statistically significant at the moral level of significance (0.01) and it indicates that the regression curve is good at interpretation the relationship among the variables of the research.

2. The significance of moral regression coefficient, which explains the relationship of the effect of (simple) in re-engineering operations at (0.38) which is a good value in the interpretation of the relationship between the two variables in addition to a significant regression coefficient if the value (T) reached (3.29), and it is a moral value at the level (0.05)

3 .The moral significance of the regression coefficient, which explains the relationship of the effect of (the referee) in the value of re-engineering processes at (0.76) which is a good value in the interpretation of the relationship between the two variables and the value (T) was (5.45), which is a moral value at the level (0.01)

4 .the moral significance of the regression coefficient, which explains the effect of (flexibility) in re-engineering processes, in addition to the moral regression coefficient at the value of (T) was (12.62), it is a moral value at the level (0.01)

5 .the moral significance of the regression coefficient explains the effect relationship (communication) in the re -engineering processes , and the value of (T) was (21.15),it is a moral value at the level (0.01).

6 .the coefficient of determination (R2) Indicates that the interpreted difference percentage in re -engineering processes due to the effect of decision support system in total is not less than (0.74) which is a good percentage and the value (F) was (148.06) which is the value of significant differences at the level (0.01) and it indicates that the curve regression example is good at explaining the relationship between decision support systems and administrative process reengineering , and the significance of moral regression coefficient , which explains the relationship between the two variables was (4.66)- a value indicates that the curve is good in explaining the relationship between the two variables , and the value (T) was (28.14), and it is a moral value at the level (0.01).

And thus the second hypothesis of the search which indicates that (there is a significant moral effect of decision support systems in the administrative Process Reengineering) approved to be right .

Table (4)
The results of the analysis of the impact of DSS and Variables in the Reengineering

Variaple DSS	R^2	f	P.Value	Regression coefficient	T	P.Value
Simplicty				0.38	3.29	0.02
Control	0.76	54.27	0.00	0.76	5.45	0.00
Flexibility				1.10	12.62	0.00
Communication				3.22	21.15	0.00
DSS TOTAL				4.66	28.14	0.00

**P<0.01 *P<0.05 N=43

Conclusions and Recommendations

It is clear that the degree of attention to the availability of decision support system did not get up to high levels , because there is 50% of the dimensions of the decision support system represents flexibility, whereas, communication didn't exceed the supposed average , and 50 % of the dimensions of the decision support system did not exceed the supposed average but within tight limits.

60% of the stages of re- engineering did not go beyond the supposed average represented in the vision stage, application stage and solution stage . This means that the degree of awareness of the re- engineering process in its comprehensive framework was not available , and it is limited to individual immature opinions.

There is a statistically significant relationship between the decision support system and work re- engineering systems, which means that an increase in the degree of interest in decision support systems leads to the promotion and success of the work re- engineering systems. it was clear that there was an effect of the decision support system in the work re-engineering systems.

Depending on what was mentioned previously , researcher recommends to increase attention of decision support systems, particularly in two of its dimensions, namely flexibility and communication. He recommends to work to consolidate the other dimensions, namely simplicity and control. The work re-engineering systems need more effort and hard work and attention at all levels, concerning this aspect, with an emphasis on the three stages of vision , solution application.

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