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Role of the Computerized Information Systems in Rationalization the Administrative Decisions: An Empirical Study in Babylon Tires Factory

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Abstract:
The study aims to investigating the role of computerized information systems in rationalization the administrative decisions. To achieve the study objectives, some indicators including (factory productivity, machines reliability, defect rate, machines maintenance costs, and machines depreciation rate) in Babylon Tires Factory during the period (1st July - 31 December, 2013) . The study reached to the following main results:

1. There was statistically significant, a positive correlation at the significance level (α = 0.05), between the factory productivity and the machines reliability, also there was statistically significant, a negative correlation at the same level between the factory productivity and both of the (defect rate, and machines maintenance costs).
2. There was statistically significant impact at the significance level (α = 0.05), for the (machines reliability and defect rate) on factory productivity of Babylon Tires.

The study recommended that necessarily up-dating the (fabric spreading machine) in fabric machines department, and made by advanced industrial origins because of its low reliability rate compared with other machines in the factory, as shown in the results of machines reliability analysis.
Key words: Information Systems, Decision Support Systems, Expert Systems, Intelligent Systems.

1- Introduction

The information revolution is taking place in today's world of flux rich in quantity and the concomitant complexity in their contents and undergone developments require preservation and to deal with them by scientific methods. It also signifies the civilization of the society in the first place and achieves economic development. According to the economic, social and technological development in the world nowadays besides the big changes in development and it's size, widely of dynamic environment, growing the probabilities of interlock the economic, social problems, it is difficult to the administration to tackle these problems by intuition and estimation at performing its main functions successfully depending on it's efficient in the rationalization decisions making. Thus, administrations realized the need to transform from an improvising administration (intuition and estimation) to an aware planning administration which represent by using a new quantitative methods of administrative decision making because of its effective role in rationalization decisions making.

According to the aforesaid, administrations badly need to use a proper scientific method in making decisions through on-shelf computer software. Computers had a big role in making decisions by facilitating the use of loads of data needed to be analyzed because of the interference of relations between variables. However, the lack of information provided by administrative information system of facilities makes usage of such software possible.

It turns out that the process of making decisions is the core and the most salient element of administration, by which a facility can achieve its intended outcomes. The more the facility business become complex and diverse, the more the process of making decisions will be important. All that happens in the middle of challenges faced by the facility alongside the acceleration of globalization . Since the process of making decisions is a relation of integration and interaction between a decision maker and computer to choose the optimal alternative among other ones.

2. Methodology

2.1. The Study Problem and it's Questions

The national economy must house all reasons required for development and modernization according to priorities allocated in all sectors, especially the priority of the productive sector, since productive foundations experience a state of obsolescence through upgrading technological and informational bases. Hence, it necessary to set up new scientific bases to measure possibilities of keeping and obsolescing certain kinds of machines through accurate scientific calculations of reliability and depreciation rates to all machines and their effect on the productivity of all departments of the facility.

This study discussed tires industry in State Company for Tires Factory, particularly Babylon Tires Factory. To solve the problem, quantitative and statistics methods were used to estimate the reliability of productive

machines and its effect, as well as the effect of other variables on the productivity of the factory concerned. Affirming all these things hereinabove, the problem of the study can be summarized by the following points:

1- Difficulty in gathering data and information about all machines reliability because there were no labels laid on machines including (machine work times, machine malfunction, maintenance done during machine work times)

2- Declination in documenting technical information in documents used at the factory, such as machine repair hours, malfunction repair cost, etc. is still in progress.

3- The lack of usage of scientific methods (quantitative method) and computer software for supporting administrative decision.

2.2. *The Study Importance*

Having developed and expanded its dynamic environment, the facility is seen as the outcome of related decisions made by managers. The permanency of any facility relies on the efficiency of decisions made by managers. Therefore, the importance of the study stems from the administration's realization to change from an improvising administration to an organized one that is aware of new quantitative methods of decision making. These methods have an important role in facilitating and rationalization the process of making decisions by the use of computer software. Also, the study highlights the most recent and important industrial facilities in Iraq presented by Babylon Tires factory.

2.3. *The Study Objectives*

The study aims to achieve the following objectives:

1- Investigating the concept of Information systems with its two sides (administrative information systems and decision support systems).

2- Investigating the concept of administrative decisions and it's guidance method.

3- Implanting quantitative methods in rationalization administrative methods in the light of information systems.

4- Measuring the relationship between factory productivity and other variables, such as (machines reliability, defect rate, machines maintenance cost, and machines depreciation rate).

5- Analyzing the impact of some variables including (machines reliability, defect rate, machines maintenance cost, and machines depreciation rate), on factory productivity.

2.4. *The Study Hypotheses*

To achieve the study objectives, it has been putting two hypotheses as a null form (H_0), as follows:

H_{01}: There was no statistically significant correlation, at the significance level ($\alpha = 0.05$), between the factory productivity and other variables, such as (machines reliability, defect rate, machines maintenance costs, and machines depreciation rate).

H_{02}: There was no statistically significant impact, at the significance level ($\alpha = 0.05$), for some variables including (machines reliability, defect rate, machines maintenance costs, and machines depreciation rate), on the factory productivity.

2.5. *The Statistical Analysis Methods*

The Statistical methods were used for data analysis as follows:

1- The Reliability function for the productive machines R(t), by the following form:

$$R(t) = [1- t_i / \sum t_i]^{n-1}$$

Where:

t_i: Machine work-times (hours) between falures.

n: Number of times the machines work.

2- Variance Inflation Factors (VIF), was used to check whether there is Multicollinearity between independent variables or not.

3- One-Sample Kolmogorov–Smirnov Test, was used to check whether the study data are distributed Normal Distribution or not.

4- Pearson Correlation Coefficient, was used to measure the relationship between the factory productivity and other variables, such as (machines reliability, defect rate, machines maintenance costs, and machines depreciation rate).

5- Multiple Linear Regression Analysis and Backward Elimination Procedure, was used to measure the impact of the independent variables on a dependent variable (factory productivity).

6- Efficiency Validation of Multiple Linear Regression Model using some typical and Statistical tests like (Beta, D.W., R^2, F, t).

2.6. *The Study Background*

After taking a look at some studies related to computerized information systems, a group of studies relevant to the study theme had been chosen. As-Sindi (1997) discussed the using of QSB computerized software to analyze the Linear Programming Model for studying the role of the sensitivity analysis in rationalization the productive plans at State Company for Wear Garments/Baghdad tents factory. She found some information, on which a decision maker at the concerned company can rely in order to plan for future productions and draft wise productive plans. Also, Al-Abboudi (1999) explained the using QSB computerized software to analyze the Linear Programming Model for deciding the optimal product collection at Ad-Diewaniah Cotton Textile Factory. He found some information which could decide the optimal product collection.

Hussein (1999) used a number of computerized software programs, such as LIDO, TORA, QSB+DSS and Engineering Series. QSB+DSS was chosen as the best computerized programs for setting up an effective information systems to support Ad-Diewaniah Cotton Textile Factory's administrative decisions regarding production, storage and humans resources. Also, Al-Ghazali (2000) used a number of computerized programs, such as QSB-DOS, QSB, and Auto-CAD for analyzing the products' record figures and upgrading them at State Company for Wear Garments in Iraq. She found that using Network Analysis increases profits of the concerned company.

Al-Hakiem (2000) discussed the computerized programs of estimating and evaluation the productive machines reliability and measuring its relation with quality, productivity, maintenance and depreciation at Babylon Tire Factory. The study investigated the intended product quality, the factory high quality, the establishment of an effective system for machines maintenance and the low rate of machines depreciation (machines productivity age increment). He found that the quantitative methods should be used in solving factory's problems by using an effective information system including all data provided in factory's documents for a brighter future of the Iraqi industry.

Some authors as (As-Sabbagh: 2000, At-Taa'i: 2002, Burhaan: 2003) explained the importance of using the computer software in solving many of the applications related to Management Information Systems, which leading to rationalize administrative decisions.

3. The Conceptual Framework

3.1. *The Concept of Automated Information Systems*

Nowadays, facilities are characterized by their diverse and expansive tasks, widespread business and complex surrounding environment. All this resulted in raising the circle of decisions that should be made under the condition of invalidation. As a result, facilities established Management Information Systems (MIS), in addition to other organizational bodies. MIS provide intended information in order to use it in making decisions. Since computers had developed rapidly and penetrated in all fields of life, facilities started to be interested in setting up Automated Information Systems (Computer Based Information Systems) because of its capability of data rapid processing and information providing which are necessary to decision makers (Touama, 2010: 21). On the other hand, the erection of on-shelf computer software programs is considered logical and organizational in terms of making decisions which provide necessary information to mangers. However, these computer programs are not decision makers but methods that can help managers make their own decisions and integrate Automated Information Systems, which are essential and systematic in the process of making decisions based on latest technology. Thus, most facilities started to depend on Automated Information Systems for gathering, providing, organizing and coordinating information related to decisions (Russell & Taylor, 1995: 47).

3.2. *The Types of Automated Information Systems*

Considering information systems is a simple method including gathering and processing data and then providing daily typical information and is called Transaction Processing Systems. As a result, there was a need for administrative reports that provide summaries about internal operations of facilities to help administrations in making decisions and this was called Information Reporting Management Systems.

The expansion and complexity of decisions circle made information provided by previous systems not adequate to decision makers. Previous systems are notorious for their high costs alongside the long time required for making information available. Therefore, many information systems which are different in their roles, technology provided in these systems and their domains of use, here are some of these systems (O'Brien, 1990: 40):

a. *Decision Support Systems – DSS*: these systems are known as an interaction among a group of systems to be used by managers in making decisions about structured and Semi-structured activities.

b. *Expert Systems - ES*: these systems are renowned for its capability of simulating human beings, who are expert and competent in giving consultations and advice, interpreting their behaviors and making decisions. These systems have the property of analysis and interpretation in fields where facts available are incomplete or weak or even both incomplete and weak. This can help in preserving rare human experience and republishing it

in places that don't have much experience or lack it. Thus, it allows to create relations which will definitely help beneficiaries get pieces of advice in order to solve problems in certain fields (Heizer & Render, 1999: 28).

c. *Strategic Information Systems - SIS*: these systems provide new availability of administration service since they are capable of dealing with that huge amount of data and providing higher administration with information about activities as well as main and secondary operations in facilities. They are also able to show data as information and statistics so as to provide the higher administration with brief and accurate information on time (Yasien, 2000: 34).

In the light of what was mentioned, Automated Information systems, presented by MIS and DSS, will be talked of in detail due to their importance at the level of application and their relation with the subject of the study.

3.2.1. *The Management Information Systems – MIS*

Information tends to be important to anyone, especially researchers, economists and businessmen, at all levels and particularly, nowadays. Thus, it can be said that a facility could never succeed, in the light of competition experienced by both developing and developed countries alongside the lack of resources, without a information system providing accurate information about its effectiveness and its internal and external activities. Since information is the lifeblood of effective and right decisions, facilities had the desire to design information systems looking forward to gathering accurate information from different sources, then submitting them to decision makers in the right time and place (Yasien, 2000: 22).

Management Information Systems can be defined as the integrated and interactive structured formation of machines, equipment, programs and working hands. These elements are important to gather and process data for providing necessary information (sending, preserving, updating and retrieving it to beneficiaries) about the internal and external environment of the organization on time for good price and quality. MIS are also concerned with the facility business in the past, predictions expected in the future and the services to be provided to all administrative levels when making decisions. This can be done by carrying out administrative jobs and utilizing information in the best way possible (At-Taa'I, 2009: 29).

Hence, MIS consists of main elements including (inputs – processing –outputs – feedback). Inputs are data, raw materials which don't give adequate significance to the variable to be used in making a decision because they may be incompatible, extra, contradictory or unorganized. Sources of data are primary, secondary or drawn from other sources, such as data base banks. In terms of gathering information alongside specifying data, methods and goals of gathering, individual control and improvisation should be avoided. To utilize gathered data, they must be transferred to information by processing. Processing data includes filtration method, which is the situation in which unnecessary data are isolated while useful ones are kept. Then, comes Data Condensation, where data get compressed, dense and brief so as the time taken for data to be checked by the higher administration become less. After that, each piece of data would be specified according to certain standards and then arranged by being given special characters in order to be put in certain places, and this is called Data Coding.

Completing all these stages hereinabove, data finally become information, which can be defined as data processed and transferred from nonsensical materials to useful information used in making right decisions (Kater, 1996: 25).

Information has different forms and shapes such as tables, charts, diagrams or even maps submitted as reports right to beneficiaries depending on their needs, according to Communication System presented by outputs, which precedes storage. Storage involves preserving information in files connected to Information Base. Because data are dynamic, information changes and tends to be unstable by being updated. Information also can be retrieved, if necessary, according to certain methods called Retrieval System. System effectiveness can be promoted through its results and outputs, and this is called Feedback. In other words, feedback involves comparing between system's actual outputs and planned outputs (At-Taa'I, 2009: 24).

3.2.2. *The Properties of MIS*

The properties of Management Information System can be fixed so it can be efficient in terms of making decisions as follows (Abdulfattah et al, 1994: 69):

1- Integration between the system elements, considering the outputs of every operation as the inputs of every latter one to avoid operation repetition.
2- Inclusion of quantitative or descriptive data needed by the unit or administration.
3- The use of advanced methods of data analysis.
4- Helping administration in routine daily activities as well as helping it in the shot-term and long-term planning.
5- Flexibility in making necessary adjustments to the system.
6- Balance among the goals to be achieved.

7- Objectivity and impartiality in preparing information.
8- Simplicity and compatibility of system and its outputs.

3.2.3. *Decision Support Systems – DSS*

The idea of Decision Support Systems came to existence in 1974 and took effect at the beginning of 18's as application of administrative decision enhancement and guidance. This kind of system had developed to become interactive and computer-based due to the deficiency of technologies used by MIS in different facilities (At-Taa'I, 2009: 95).

Khashabah sees that gathered information seems to be inadequate for decision makers because of the complexity of administrative problem and the development of computer and its software programs. This led facilities to use DSS in order to help decision makers, not to replace them, by compromising between their own estimations and the estimation of the system to support the decision made, taking into consideration the need to inquire about information while ordering (Khashabah, 1995).

Computer programs and data bases are also used for solving the problem. This means that decision support systems concentrate on providing managers with information interactively to support them at solving semi-structured and unstructured problems (O'Brien, 1990: 331).

3.2.4. *The role of DSS in making decisions*

Before studying the role of DSS in making decisions, the concept of decision making process, its stages and the mechanism of administrative decision guidance should be identified as follows:

3.2.4.1. *The concept of making decisions*

As for Simon and Barnard, the process of making decision is considered the core of administration and the scientific method of solving administrative problems.

A **decision** can be defined as choosing the best alternative among other given alternatives, while **the process of making decision** is making preference among all suggested alternatives and choosing the best one among them so as to solve a problem within a limited period of time (Touama, 2010: 20).

According to all aforesaid, the process of making decision is deemed the core of the administrative process, in which the best alternative is chosen, especially nowadays in light of many complex changes which a facility make and get affected by due to the advent of globalization, its diverse and expansive business as well as social and economic challenges faced by the facility.

Some writers said that the process of making decision is the scale of success or failure of administration according to the decision's truth value. It is known that there were a lot of wrong decisions which caused many organizations to destruction. Thus, bases and methods of making decisions must be focused on when talking about administrative process. As a result, the process of making administrative decisions is a state of integration and interaction between computers and decision makers using quantitative methods for choosing the best alternative and achieving the goals of the facility.

3.2.4.2. *The stages of making decision*

There have been numerous attempts over the years by management writers, philosophers and military leaders toward the steps and stages of decision-making, and these attempts resulted in several steps and stages was as follows (Touama, 2010: 21):

1- Diagnosing the problem.
2- Analyzing the problem's surrounding environment and determine their causes.
3- Developing the solution alternatives.
4- Evaluating the alternatives.
5- Choosing the best alternative.
6- Applying the decision and follow-up and the evaluation of application.

A manager tends to make a decision when:

1- Manager sense of the problem and admitting it .
2- Presence of pressures towards solving the problem.
3- There is more than one alternative.
4- Uncertainty from the preference any of the alternatives proposed.

In light of the previous motives, it is necessary to make a decision, to reduce or minimize the problem effects or cancellation it, where decisions are made in different conditions depending on the prevailing climate, among them the following (Touama, 2010: 31):

1- Decisions under Certainty.
2- Decisions under Risk.
3- Decisions under Uncertainty.

3.2.4.3. *The mechanism of rationalization administrative decisions in light of DSS*

The DSS role can be concluded by providing support to improve the quality of decisions, which in turn, rely on compatibility and adequacy of available information alongside given alternative solutions. DSS involve merging data, models and computer programs as well as connecting the three elements including data base, available information and quantitative models (mathematic and statistical models and operations researches) to the decision maker (Power, 1997: 113).

Therefore, DSS role in guiding administrative decisions can be shown by the characteristics of these systems summarized by (Turban et al, 2008: 574) as follows:

1-Helping decision makers carry out semi-structured tasks.

2-Relying on human-machine interaction by providing inquiry services for getting answers in order to find alternative scenarios to decision makers.

3-Providing help and support to decisions at all administrative levels, especially the higher administration. Decision support can be individual, or even unanimous to promote the spirit of cooperation among decision makers with different levels.

4-Providing help and support to independent decisions and dependent decisions with are made after a group of individuals interact among one another.

5-Helping decision makers find solutions for study's problems while giving them the right to carry out their main jobs of control and censorship on the process of making decisions.

6-Connecting data bases to mathematic and statistical models.

7-Providing help and support in any stage of making decisions, starting from specifying problem till the final stage of choosing the best solution. Decision support starts by searching for problems and the reason behind them as well as trying to solve them through a number of alternatives which could help decision makers choose the optimal solution among them.

8-Responding rapidly to all changes because they are flexible and can be adjusted depending on surrounding conditions.

4. The Statistical analysis and results discussion

4.1. *Results of the hypotheses testing*

Before testing the study hypotheses, some tests to be applied on study data, included in appendix (1), should be validated as follows:

a. Variance Inflation Factors - VIF Test

This test was used to validate Multicollinearity. Table (1) shows the results of the test:

Table 1. Results of (VIF) Test for validating Multicollinearity between variables

No	Independent Variables	Tolerance	VIF	Critical Value
1	Machines Reliability	0.195	4.138	5
2	Defect Rate	0.291	3.439	5
3	Machines Maintenance Costs	0.101	3.947	5
4	Machines Depreciation Rate	0.284	3.521	5

According to table (1), results showed that there was no Multicollinearity between the independent variables. This could be proved by VIF test values of (4.13, 3.439, 3.947, 3.521) of (machines reliability, defect rate, machines maintenance costs, and machines depreciation rate) respectively. In which all these values are less than the test critical value of (5).

b. One-Sample Kolmogorov–Smirnov Test

This test was used to check whether the study data distributed Normal Distribution or not, through the following statistical hypothesis:

H_0: The variables data is distributed Normal Distribution.

H_1: The variables data is not distributed Normal Distribution.

Table (2) shows the results of testing the normal distribution hypothesis using (One-Sample Kolmogorov–Smirnov) Test, as follows:

Table 2. Results of (One-Sample Kolmogorov–Smirnov) Test

Study Variables	N	Kolmogorov-Smirnov (Z)	Asymp. Sig. (P-value)
Factory productivity	17	0.789	0.562
Machines Reliability	17	0.588	0.880
Defect Rate	17	0.741	0.642
Machines Maintenance Costs	17	0.587	0.881
Machines Depreciation Rate	17	1.248	0.089

Critical value of (Z) is (1.96) at the significance level (α = 0.05).

According to table (2), results showed that all (Z) values of study variables were less than the critical value of (Z) which (1.96). The results also showed that all statistical significance values (P-value) were more than the significance level (α = 0.05). In the light of the previous results, the null hypothesis (H_0) was accepted, i.e. (The variables data were distributed Normal Distribution).

After assuring that there was no Multicollinearity between independent variables, and the variables data were distributed normal distribution, making it ready for having all analytical tests.

4.1.1. *The first hypothesis*

H_{01}: There was no statistically significant correlation, at the significance level (α = 0.05), between the factory productivity and other variables, such as (machines reliability, defect rate, machines maintenance costs, and machines depreciation rate).

To test the first hypothesis validity, Pearson Correlation Coefficient was used as showed in table (3):

Table 3. Results of Pearson Correlation Coefficients between the variables

The Variables	Machines Reliability	Defect Rate	Maintenance Costs	Depreciation Rate
Factory productivity	0.666 **	- 0.680 **	- 0.663 **	- 0.198
Sig. (P-value)	0.003	0.003	0.004	0.446

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

Table (3) showed the following results:

a. There was statistically significant relationship, a positive correlation, at the significance level (α = 0.05), between the factory productivity and machine reliability. This could be proved by the statistical significance value of correlation coefficient (P-value) which was less than the significance level (α= 0.05), between the factory productivity and both of the (defect rate and machines maintenance level (α = 0.05).

b. There was also statistically significant relationship, a negative correlation, at the significance costs). This could be proved by the statistical significance value of the two correlation coefficients (P-value) which were less than the significance level (α = 0.05).

c. There was no statistically significant relationship between the factory productivity and machines depreciation rate. This could be proved by the statistical significance of correlation coefficient value (P-value) of (0.446) which was more than the significance level (α = 0.05).

4.1.2. *The second hypothesis*

H_{02}: There was no statistically significant impact, at the significance level (α = 0.05), for some variables including (machines reliability, defect rate, machines maintenance costs, and machines depreciation rate), on the factory productivity.

To test the second hypothesis validity, Multiple Linear Regression Analysis and Backward Elimination Procedure were used as showed in table (4):

Table 4. Results of the Multiple Linear Regression Analysis and Backward Elimination Procedure

Model	Unstandardized Coefficients (β)	t-test	Sig. (P-value)	Standardized Coefficients (Beta)
)β_0 (Constant	- 2.003	- 1.381	0.189	-
Machines Reliability	3.620	2.205	0.045	0.433
Defect Rate	- 0.284	- 2.342	0.034	- 0.460
				Adjusted R-Square: 0.544
Multiple Correlation Coefficient (R): 0.775 , Adjusted R-Square: 0.544 Std. Error of the Estimate: 0.298 , Durbin-Watson: 2.102 F-ratio: 10.483 , Sig. of (F): 0.002				

{F table value, given degrees of freedom of denominator and numerator at the level of significance (α = 0.05)} = 3.74

Table (4) showed the following results:

a- The results showed that (F) ratio (10.483) was more than the critical value of (F) (3.74), also it showed that the statistical significance (P-value) which is (0.002) was less than the significance level (α = 0.05). Thus, the null hypothesis (H_0) was rejected. This means that the Multiple Linear Regression model is valid, while the impact of the variables such as (machines reliability, defect rate, machines maintenance costs, and machines depreciation rate) on the factory productivity can be measured at Babylon Tires Factory.

b- Results showed that the statistical significance of regression coefficients (β) were valid only for the (machines reliability and defect rate). Thus, there was statistically significant impact for the (machines reliability and defect rate) on factory productivity at the significance level (α = 0.05). This could be proved by (t) values of (2.205, -2.342), and the statistical significance values of (0.045, 0.034) which are less than (α = 0.05). Thus, the null hypothesis (H_0) was also rejected.

c. The Machines maintenance costs and machines depreciation rate were eliminated from the Multiple Linear Regression Model, because of their weal impact on factory productivity. This could be proved by their statistical significance values of (0.906, 0.736), respectively, which are more than the significance level (α = 0.05).

d- The determination coefficient (R^2) value of (0.601) indicates that the machines reliability and defect rate interpreted (60.1%) of changes in the factory productivity, while the remaining percentage of (39.9%) were referred to other variables which were not included in the multiple linear regression model.

e- The standardized coefficients values (Beta) of (0.433, -0.460) for machines reliability and defect rate, respectively, indicated that if machines reliability increased by one unit of standard deviation, the factory productivity would increase by (43.3%). Also, if defect rate increased by one unit of standard deviation, the factory productivity would decrease by (46%) .

f-The D.W. value of (2.102) indicated that the variables don't have autocorrelation. Also, D.W. value lies in an area where autocorrelation doesn't exist. Hence, the results showed that (du < D.W.< 4- du), in which (1.446 .<D.W.< 2.554).

According to the results of Multiple Linear Regression analysis, the predictive model was explained in the following formula:

$$\hat{Y}_i = -2.003 + 3.620\ X_1 - 0.284\ X_2$$

Where:

$\acute{Y}_i$: Factory Productivity , X_1 : Machines Reliability , X_2 : Defect Rate

The machines maintenance costs (X_3) and machines depreciation rate (X_4) were eliminated from the Multiple Linear Regression Model because they had not verify the statistical significance.

5. The Conclusions, recommendations and suggestions

5.1. *Conclusions*

The study reached to some important conclusions in light of the results, as follows:

a. The analysis results of the machines reliability showed that (layers cutter machine) had the highest reliability of (0.918), while the (fabric spreading machine) had the lowest reliability of (0.744), among all machines at the factory, knowing that those two machines are of Fabric Department.

b. The correlation analysis results showed that, there was statistically significant, positive correlation at the significance level ($\alpha = 0.05$), between the factory productivity and the machines reliability.

c. The correlation analysis results showed that, there was statistically significant, negative correlation at the significance level ($\alpha = 0.05$), between the factory productivity and both of the (defect rate and machines maintenance costs).

d. The correlation analysis results showed that, there is no statistically significant correlation between the factory productivity and machines depreciation rate.

e. The results of multiple linear regression analysis showed that, there was statistically significant impact at the significance level ($\alpha = 0.05$), for the (machines reliability, and defect rate) on factory productivity of Babylon Tires. These results confirm the importance of those two indicators on factory productivity, and the importance of information systems and it's role in rationalization administrative decisions.

f. Also, the results of the analysis showed that, there is no statistically significant impact at the significance level ($\alpha = 0.05$), for the (machines maintenance costs, and machines depreciation rate) on factory productivity of Babylon Tires.

g. The study confirmed that Babylon Tires Factory depending on a simple information system concerning by collection data and saving as well as providing the routine daily information. However, the factory doesn't have an independent information system as a unit in the organizational structure of the factory.

h. The previous studies affirmed that using computer programs help decisions makers to build an effective information system through out to rationalization administrative decisions about different activities within the project.

5.2. *Recommendations and suggestions*

In light of the results, the study recommended and suggested the following:

a. The study recommends that rubber spreading machines should be ungraded and made by advanced industrial origins of its low reliability rate compared to other machines in the factory as shown in the results of machine reliability analysis.

b. Financial allocations to design an efficient information or enhance the current system, which is based on the use of computer programs for administrative decision guidance, at factory must increase in conformity with factory activity as well as the quality and quantity of decisions made.

c. The study recommends that computer programs should be used at facilities because of its importance in designing the information system, in which decisions about different activities will be guided.

d. Creative employees at factory, especially administrative information systems employees, must be encouraged, given raises and motivated.

e. The study suggests that internship courses and workshops must be held for administrative information systems employees, discussing the most important recent concepts about administrative information systems alongside the use of computer programs because of its role in supporting administrative decisions.

f. The study suggests conducting future relevant studies including other factors, such as availability and malfunction average function alongside the factors included in this study to estimate the impact of these factors on administrative decisions guidance in different facilities.

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