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The Impact of Information Systems in Decision Making Of Pharmaceutical Industry

Emin Qerim Neziraj
University of Pristina, Economic Faculty, Albania

Aferdita Berisha Shaqiri*
University of Pristina, Economic Faculty, Albania.

Abstract

Background: In this article was dealing with the topic, which are closed with phenomenal of information systems and decision making process in Kosovo pharmaceutical industry. The theoretical background is based on theoretical approaches and contribute till now, according to the mention topics. Methodology: The topics information systems and decision making process are social category, as a social category in the article was applied the social quantitative research. According to quantitative method to deductive approach was concluded that the exit theory of information technology and decision making process are in line from theoretical and practical issue. Analyses: In the paper were analyses the influences of ICT to making decision process by econometric model Yc=B0+Bxperformance+Bxlevelof using information systems. According to mention model was concluded that the lack of integration of information systems in pharmaceutical industry affects the quality of decision-making where they using IS also there is a positive aspect of linked between business performance and quality of decision. This concluding is based on p=0,36 and if=0,46. Conclusion and recommendation: This article was realized research in the pharmaceutical industry of Kosovo regarding with mention topics. And there are many recommendations, which can put in one set the institution of pharmaceutical industry in Kosovo must adapt IS in their work and to respect legislative strategic plan of Kosovo. Because in the Kosovo, their companies using the IT in the low level regarding to the decision making process, also they are till about level of EU countries regarding with electronic business.

Key words: Pharmaceutical industry, Information Technology, decision making, information support systems,

INTRODUCTION

Every day, both personally and in Pharmaceutical industry, there is a need for a choice among possible solutions by making simple or complex decisions. The selection results may have a short-term impact, but can also be a long-term and far-reaching nature, depending on whether the decision was successful or unsuccessfully made at an appropriate time [1]. The decision-making process involves several interrelated steps, a choice among the available options is an essential part of the process that precedes forecasting solutions to the problem and the results of the final selection. Considering that decision selection affects the success, failure and the outcome of a future state, it's expected from a decision-maker to solve the problem for which steps were taken previously in the decision making process.

With the arrival of the market economy on the premises of the countries of Southeast Europe as is Kosovo and increasing presence of foreign capital behind has brought new ways of management or decision-making. Also, the educational process, especially universities, in their curricula in the field of economics and management pay special attention to quality business decision-making and develop management skills. Quality business decision-making is critical to the business success of the company [2].

Decisions may be different; from those that are repetitive and simple with the easy ability to change the outcome, to decisions where careful evaluation, placing increasing demands for detailed judgment and analysis is more important. If the outcome of decisions made doesn't cause greater harm or change [3], the decision is less important. However, if the outcome of the decision significantly affects the individual, group of people, organization, institution or environment it is necessary to carefully reflect the steps in the decision and in the decision-making process. The purpose of decision making is to achieve a positive outcome with successful, cost-effective and timely decisions, and if possible to avoid the wrong selection of negative outcomes and to reduce or mitigate the consequences.

Problems that the decision maker faces are not always uniform or straightforward. The environment is mostly dominated by uncertainty and risk situations, allowing the decision-making process to be more difficult, complex and demanding. The area is subject to frequent changes under the influence of new technologies and networking; modernization models, methods, tools and techniques in decision making; exchange of information and data to new forms of communication [4]; availability of raw data and data; opportunities that are available to the decision maker and so on. According to a forecast of changes, the decision-maker must be prepared to face the challenges and new trends and respond promptly to achieve a positive outcome of the decision [3]

The Pharmaceutical sector in South-East Europe respectively in Kosovo as a part of SE countries faced with many problems during the decision-making process. One of the main problem during mention process is using intuitions by CEO managers in companies [4]. As is know the user just intuitive during decision making may impact negative to the decision quality and take negative consequences for the business and business performance. In relation to making the best decision for the present problem in the firm the CEO managers using information systems. The information systems may help them to make best choices during the solving problem, the information systems in our self-has to many subsystems which help, simulate and demonstrate choices of alternatives which CEO managers can approve. So the aim of this paper is research of the influences of information systems to the decision quality in Kosovo Pharmaceutical sector. According to the aims of the research, the research questions in this study will be to find the level of information systems which used from the business during decision making in Kosovo Pharmaceutical industry and another R.Q. how the level of operative performance during IT using the influence decision making into operative performance. To achieve the first research in Kosovo according to with this phenomenon and give the opportunity for future research in this research area

MATERIALS AND METHODOLOGY

The research methods that used in this paper are methods which using in the social science, because the issue as decision making, information using is social categories, according to this social method of research also the results explanation will be provide with adequate method. In this research was use the quantitative, method with deductive approach, so we want to exist theory of decision making and information to confirm with analyses part regarding with quantitative data [6] Before application the

mention method and scientific approach it is important to explain the how the use and which sources was used for this research First of all, the t main secondary sources of information include foreign and domestic literature: books, scientific journals, and the Internet.

According to statistical report form ASAK2016 we can conclude that the number of medium and big manufacturing enterprises in Pharmaceutical industry in the Republic of Kosovo is 60, so for this research the selected samples is 54 (fifty-four) enterprises, of which 46 (forty-six) are medium and 8 (eight) large or biggest, accorded with a 95% accuracy of 0.05. So based on the enterprise sample we have selected 1337 respondents or 1337 managers of all levels. The next table will be present the respondent's opinion according to the statistical variability regarding with case of report between level of managers and making strategic decision.

The quantitative data in this research were taken from questioner of PhD thesis which is not published till now with the topics as is mentioned in the methodology research path. For testing the variables and hypothesis uses the regression model based on the econometric model as is shown in the part Operationalization of variables. So the variable performance and level of using information systems was tested by elements of statistical descriptive, as is Mediana, Variance and Standard Deviation of correspondents answer results. After those results in the relation to testing by regression equation model, it was using the factor analyses, which help to find which factors influence in the decision quality and in the making decision process quality, because this is explanatory research. And in the end, the hypothesis was tested by R square and p as the output of Anova analyses which give the regression analyses.

For instance, to explain and know which is level of using the information systems in Kosovo enterprises during in decision-making process in this paper will be present and using the variables such as: Decision quality, Performance, and level of using information systems. The variable decision quality is depended on variables, performance and level of using information systems are independent variables. The testing model will have based on factor regression equation.

$$Yc=B0+B_{xperformance}+Bx_{levelof\ using\ information\ systems}$$

The main equation was used for testing the hypotheses in this paper which is:

H1: The lack of integration of information systems in enterprises affects the quality of decision-making

H2: The performance influence in the decision quality in Pharmaceutical industry

H3: The information system may influence into the decision quality in Pharmaceutical industry

RESULTS

As we can see in the table 1, low managers make strategic decisions - little since,their average is 1.27 and the data distribution is 1546 with its coefficient of 20.59%, which means that the average is acceptable and reliable.

While middle managers make strategic decisions at a satisfactory level, their average is 2.86, with variance 1532, with a 10.25% coefficient of probability. As for senior managers, the results show that they make strategic decisions at a satisfactory level, as the average of their responses is 2.85 with the variance 1555 and the coefficient 0.08%.

The theory of decision making says and instructs that only top managers make strategic decisions and other levels of management made just participation on decision making, our research shows that in Pharmaceutical industry of Kosovo, besides top managers, strategic decisions also receive lower and middle managers, but at a lower level, which directly affects the ineffective and inefficient management of Pharmaceutical industry in Kosovo.

In the table 2 we will present data on ways of making decisions of Kosovar managers Pharmaceutical industry. Out of three forms of decision-making measured by the values of statistical variability measures, intuitive decisions, knowledge-based decisions, and decisions based on analysis or rational decisions. Following will be a table with results that show how the managers of the respective levels make decisions based on the intuition.

In table 2 the results show that the Low managers are based on little intuition while making decisions (more generally - see table no in the appendix), with average 1.75 and variance 2339, with a coefficient of 6.15%. Medium managers rely little on intuition when making decisions (more generally - see table no in the appendix of this paper), average 2.01 and variance 1539, with 8.23% coefficient. Top managers are based on a sufficient level of intuition when making decisions, average 2.01 and variance 1539, with a coefficient of 13.05%. In the following table we will present the relationship between management position and support systems during decision making.

Table 1: The average and statistical variability of the ratio between the level of managers in the enterprise and Pharmaceutical industry the making of strategic decisions by them

Managers Level	Strategic decision				
	Total	Me	Variance	SD	Coefficient Probability
The middle managers	382	2,86	1532,207	39,14	10,25%
The Low managers	764	1,27	1546,963	39,33	20,59%
Top managers	191	2,85	1555,105	24,17	0,08%
Total	1137				

Table 2. Average and statistical variability of the relationship between the level of managers in Pharmaceutical industry and decision-making based on their intuition

Managers Level	Intuitive decision				
	Total	Me	Variance	SD	Coefficient probability
The middle managers	382	2,01	1539,856	24,4	8,23%
The Low managers	764	1,75	2339,750	28,45	6,15%
Top Managers	191	2,64	1338,3218	20,28	13,05%
Total	1137				

Table 3. Relationship between Managerial Position and Support Systems in Pharmaceutical industry in Kosovo

Managers Level				No	Sometimes	Yes	Total
	The middle managers						
		%		20,0	20,0	60,0	100.0
		% of Total		5,3	5,3	15,8	26.3
	The low level of managers						
		%		0,0	100,0	0,0	100.0
		% of Total		0,0	5,3	0,0	5.3
	The top managers						
		%		16,7	50,0	33,3	100.0
		% of Total		10,5	31,6	21,1	63.2
Total							
		%		15,8	42,1	36,8	100.0
		% of Total		15,8	42,1	36,8	100.0

Based on the results from table no. we can conclude that: The 100% or 764 of low-level managers sometimes use support systems (SS-s) during decision-making, Secondary managers 20% of them, or expressed in number, 76 of them do not use SS during decision making, 60% of them, or, expressed in numbers 230 use SS during decision making and 20% of them, or, expressed with number of, 76 of them sometimes use SS decision-making. From this we can conclude that 80%, or, 296 of middle managers use SM during decision-making While 16.7%, or, expressed in numbers, 32 senior managers do not use SS during decision-making, 33.3%, or, 64 senior managers use SS every time, 50%, or, 155 senior managers use SS. Following figure 1 present the factor analyses between variables regarding with their categories As can see the derivate of factor analyses in this study is variabiles strategic group decision making, supporting systems and organizational performance

Table 4 will present the correlation between variabiles strategic group decision making, supporting systems during decision makinng and organizational performance. As far as theoretical support exists. There are some definitions by different authors regarding the meaning of the correlation analysis, but all those definitions have almost the same meaning. Therefore (Krasniqi, 2012) Correlation analysis is a measure of inter link ability between the two variables. According to Paul Newbold, 2010, with the correlation analysis, there is a finding of the existence of the connection between phenomena, its form, power, and cough without prejudice to the cause and consequence.

The correlation analyses show us the possitive correlation between variabiles with the high results ,951 ,984 ,899 and signifikance ,000 and ,003. The meaning of this possitive relation is that the testing model inside has the relative variabiles which influence between each other. The table no present the R value of testing regresion equtioan model.

Table 4 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.972[a]	.945	.918	.30339829

a. Predictors: (Constant), Organizational performance, Support ystems during decision making

b. Dependent Variable: Strategic group decision

The table 4 model summary present that the Adjusted R Square is very high ,918 that mean the support information systems both with operative performance indicate to quality decision and there are in dependent correlation. On the other way of view we can conclude that predictor variabiles organizational perfomance and support systems influence on strategic groupdecision. The next table 5 will present dhe regresion and resudual value of ANOVA model.

Table 5 ANOVA Reusults[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6,358	2	3,179	34,538	,003[b]
	Residual	,368	4	,092		
	Total	6,727	6			

a. Dependent Variable: Strategic gruop decision

b. Predictors: (Constant), Organizational performance, Support systems during decision making

So the significance of regression model is 0,003 that mean the performance and information system influence on decision making strategic process if we see the Hypotheses we can conclude that the H2 and H3 are approve. The model value of B coefficient can be seen in the table 6.

Table 6 Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	243	,152		1,605	.184
	Support systems during decision making	1,193	,690	1,126	1,728	.159
	Organizational performance	2,204	,698	2,059	3,159	.034

a. Dependent Variable: Strategic group decision

So the constant variable which is strategic group decision is 243 with the significance of 0,184 the independent variable support systems during decision making have the value of beta coefficient is 1.193 with sig = 0,159 and organizational performance 2.204 with sig 0,34. So, those value of variables can using for the model for testing hypothesis.

The problem in Pharmaceutical industry of Kosovo according to H1 is No integration of information system between management sectors and level and in the future the managers must work in to creation integrity in all enterprises the support system.

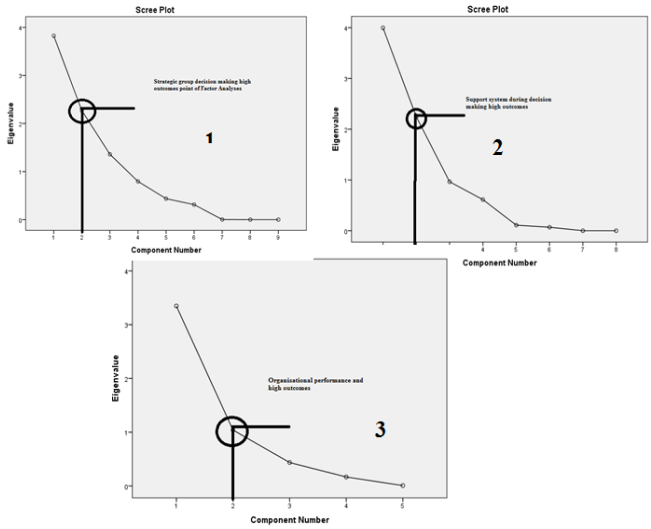

Figure 1. The Scree Plot of factor analyses for the variables

CONCLUSION

The decision maker, when deciding, faces unambiguous, dubious and risky situations, fear of decision-making and other restrictions that can make decision-making process difficult slow it down or disable it (For the quality decision-making in such circumstances a timely dispose of information is necessary, carrying out an assessment of potential solutions and analysis of the impact of the environment with a view to a positive outcome. Since every decision brings changes, timely decision selection among possible solutions will be reflected in the short term or the long term on the further course of actions of decision makers in relation to the outcomes.

Companies from Pharmaceutical industrz the countries of Kosovo are increasingly applying the concept of business decision-making because they themselves have realized the necessity of timely business activity. For this purpose, various business information systems that facilitate the decision-making process and thus profitable fixes are used. Investment in such systems should be seen as a cost-effective investment, although these systems are expensive [4].

Separation of important from less important data and information and the ability of timely and accurate decision-making differs the unsuccessful from successful decision makers. Therefore, the decision maker must be aware of new technologies and modern trends and be ready to face the challenges of today. The original role of computer systems is the collection, processing, storage and availability of data and information for future use and sharing [4] [7]. Data and information needed to determine the possibilities of available decision are available to the decision maker by simplifying choice by converting them into new opportunities, knowledge, future development opportunities among new values.

Since the decision maker makes the final decision, the new technology also plays an important role in the process of private and business decision-making by providing assistance in calculating a greater choice of possible solutions. By analyzing the problems and consequences of the selection, the forecast of future selection results, reducing fear in decision-making, simplification in the selection decision, the new capabilities in the mode of thinking and choosing solutions, creating new value. The role of new technologies in the private and business decision-making is repeated. [10]

As the new technologies primarily affect the development and emergence of new tools, models, methods, techniques and systems that are tailored to customer requirements, and decision makers, but also the types of decisions that need to be made, there is a requirement that the upgrade and use are continued in the future in order to improve and simplify the decision-making process. Furthermore, increasing success in decision making, achieving a positive outcome of decision-making, use of stored data and information, easier access to reports, the possibility of feedback from decision-makers, the research potential consequences of available decision are just some of the benefits arising precisely from the use of new technology in the decision-making process [9].

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