

Studying the role of management information systems in improving organizational performance (Case Study: National oil rich regions Company)

Saeed Zeinalpour Ahrabi¹, Soroush Avakh Darestani²

1. *Master of science in Industrial Engineering, Islamic Azad University, Anzali International Branch, Iran*

2. *Assistant professor, Islamic Azad University, Qazvin Branch, Iran*

Abstract

Nowadays, information is the main factor of power and mastery of information is the true mastery. War between rich and poor countries is in fact the war of information and domineering countries that want to continue their exploitation of resources and wealth of backward countries have no interest in development of information infrastructure in these countries. Information management is a tool that helps managers make decisions. Managers achieve recognition by receiving information and processing it and identify possible options in problem solving through it and select the most appropriate of them. When manager starts to organize, he plans or hires human resources. Science of Information Management has been born and has grown with developments of the century and unfortunately, management in developing countries has a faded and an incomplete understanding of information management which results in abnormalities in the economic development and coordination of their activities.

Keywords: management information systems, organizational performance

Introduction:

Entering from industrial age to the information and knowledge age has affected all different aspects of human life. Organizations as institutions that have been the achievements of the industrial age have faced many changes with recent developments and entering the era of knowledge. Information management systems have been known as a new phenomenon and a driving factor in compliance with organization with modern developments (Azar et al., 3: 2011).

Globalization, the emergence of a service economy based on knowledge and information, Organizational transformation and method of managing successful organizations and the emergence of the digital agencies have changes the business environment and have made managers to pay more attention to information systems to face emerging challenges. Nowadays, managers have come to the conclusion that the proper leading of geographically dispersed organizations, establishing and maintaining the proper relation with suppliers and distributors, providing merchandise and services for 24 hours a day in national

and international environments, preparing required local and international reports merely by information systems and information technology have become a strategic factor for survival, creation of competitive advantage and improvement of profit margins and that is why developed countries have done the most investment in information technology in recent decades (Banaian, Mohammed, 2008).

Nowadays, the increasing spread of information and communication technologies has changed different areas of human life. One of the areas which has had fundamental developments with introduction of these technologies is the field of Education and management in a way that managers of the twenty-first century live in a constantly changing environment and presence in the competitive field and effectiveness in this environment is not possible without having cognitive, knowledge and attitude skills and this makes planning for teaching such skills necessary (Shafiee, Masoud, 11: 2005).

In today's world, information and communication are complements of insightful development. In fact, existence of enough information and its collections in professional classifications have made people be able to gain access to knowledge and its application. Theories such as Global Village, electronic government, e-commerce, electrical training, etc. indicate the growth of a new environment in which information technology and education are all around us and access to specific information makes people use it to solve problems (Tabesh, Masoud, 3: 2009).

In these circumstances, information along with factors such as human resources, raw materials, capital, energy and machinery play an important role as one of the factors of production and this role becomes more important from day to day and over time. Thus, as the efficient use of other resources needs management, information is also no exception and the proper use of it as a vital source requires proper and regulated management. Management information system is a science which is used for the same purpose which is information management. Undoubtedly, with the development of organizations and expansion of duties and responsibilities of the management, management decisions should always be based on technical and statistical studies and correct information and according to certain scientific principles and methods. So obviously, adopting any kind of appropriate decision requires access to right, accurate and timely information. Hence, the need for an adequate information system in organizations is inevitable. Unfortunately, the information and its importance do not have their real position in third world countries and that is why information infrastructure does not have satisfactory and efficient form in these countries. Traditional methods of managing information do not meet rapidly changing conditions of our times and we cannot solely rely on mentalities or limited reports or statements of those involved in dealing with the problems and challenges and important decisions and effective and efficient management requires collection, sorting and processing a multitude of diverse information which grows rapidly and this fact makes them more difficult to analyze. With the rapid advancement of information technology and the growth of knowledge and ability in different groups of society and increasing the level of their expectations, Government agencies should also seek for proper use of these technologies and increase the speed and quality of their services. The establishment and application of management information system for appropriate decision making and Careful planning in order to increase efficiency and productivity in government agencies can help managers and policy makers of government agencies. Thus, at the same time with increasing development of information technology in the world, more attention to this technology is required in national planning (Roodposhti, Fereydoun, 2010).

Poverty and lack of information not only makes Agencies and organizations not have correct and complete picture of the future, but also not be able to correctly and completely identify strengths and weaknesses and previous and current situations, thus, they cannot have proper goal setting and cannot design appropriate activities for these organizations and thus, there will not be optimal use of organizational resources. Hence, one of the major causes of inefficiency and failure of the administrative system of Iran can be Poor or wrong and untimely Management decision due to not having adequate and appropriate information and this can be due to not considering sufficient importance for relevant, accurate, precise, reliable, timely and complete information (Kerinj, FN, 2003).

Despite vast investment in information technology, accurate information obtained from these investments are not available for various reasons. Failure is more common than success in these investments and expected efficiency and effectiveness of investment in this area has not been achieved in organizational and national levels (Mansourfar, Karim, 2008), thus, evaluation of the reasons for failure of management information system is essential to identify barriers and adopt the necessary preventive measures to eliminate obstacles or to reduce their effect. On the other hand. However, studies show that failure to use information technology is contingency. In other words, this failure is considered as a function of the conditions of application of information technology (Dehning and Richardson, 2002).

It should be noted that Management information systems which is common with the concept of (MIS) in developed countries is not used in Iran, especially in departments and agencies and generally any information system even other types such as (TPS) which prepare and provide reports for managers of organizations are considered and named (MIS) while these systems do not have all characteristics of a real (MIS).

Nowadays, companies that have enter the competition in new markets become weaker due to existence of different ways of doing and understanding business. One of the factors which cause these changes is continuous and revolutionary changes in technology (Chalemta, 2006). Existence of Labor system and lack of expert Viewpoint in staff and workers and lack of accurate correct and timely information will cause many problems. Thus, improving efficiency and performance through the deployment of modern science and technology and management information system appears to be necessary (Tabesh, 2009: 5). On the other hand, since organizations are at different stages of life cycle of information systems and due to the diversity of their information needs, a fixed methodology cannot be given for the design of information systems of all organizations. Hence, experts of management information system suggest set of tools where design of information systems is done with the emphasis on contingency vision using one or more methods (Kalantari, Khalil. 2008).

Organizational performance shows how an organization reaches its mission and goals. Organizational performance indicates the start of a given situation and reaching a precise target which may include multiple target points such as market share, sales volume, employee motivation, customer satisfaction, quality, etc. (Skaran, Uma. 2009). Nowadays, due to increasing competition between organizations and in line with change in the organization, each organization is looking to have a more efficient performance. Understanding the issues affecting organizations leads to further effectiveness of them (Ali Babaei, Ahmed. 2005).

Information systems provide three types of advantage for the system: Improved productivity, improved efficiency and competitive advantage. Not only MIS supports managers in strategic affairs but it also provides the necessary information for the tactical managers in routine decisions and enables them to access information which help in their decisions. These systems can reveal images of contradictions and deviations from the set plans. Such information is given to the manager through the provision of reports in logical and justifiable templates and images. Management information systems of human resources, finance and accounting, production management and marketing and sales are among the subsets of MIS. Managers must be aware of the real world and systems in the organization using these systems in order to be able to play an effective role and that is why they need to have correct information. Management information systems are used in planning, organizing, leading and motivating, reporting and control due to advantages such as closer connection, more accurate control, more reliable data collection, faster processing of data and conversion of those to information of managers and these management practices are done with the utmost precision and efficiency in much less time in the organization. Since, governance system management information system is a vital necessity in the Iranian petrochemical industry, the main search question is expressed in this way that: what is the effect of management information system on the performance of national Companies of oil-rich areas?

The most important issue in the use of information technology which separates oil industry from other branches is the problem of integration which means method of exchanging information among designers, consultants, builders, clients and contractors. Most of the present information technology tools have been designed without proper attention to the whole process and the needs of the oil sector and in other words regardless of the status of a special program in the whole process and its compatibility with other software. By considering these problems and the fact that each oil project (drilling, exploration and reservoir) may in itself have a huge extent and purpose, information technology will remain in a supporting and not a strategic role in the near future. Information technology will be used to achieve production on a small scale - not for strategic advantage over competitors and to carry out low level activities - not at the level of senior management. Passing the era of data processing and using basic and strategic advantages of information technology requires the overcoming of current sustainable situation. Achieving strategic advantage with information technology requires revision of traditional rules of decision-making process. Each sector in the oil industry (mining, exploration and reservoir) has its own professional domain and the boundaries between domains are rarely broken (Endam, Farshad, 2009).

Research method

Research means evaluation process of one thing, matter, and phenomena to understand and control it. From this definition, it can be argued that scientific research is done for two reasons: understanding the nature, process and stimulants and consequences and causes of a phenomenon or identifying and controlling a problem if it exists, in both cases, the task of a scientific research is controlling and predicting a phenomenon. There are different classifications for a scientific research in terms of objective, the type of issue, tools and information used in data collection, data analysis method and

In terms of data collection approach, research is divided into three categories of quantitative, qualitative and combination of both. Research is divided into three categories of basic, applied, and developmental in terms of orientation. Research is divided into three categories of descriptive, analytical, and exploration in terms of objective. Also the research is divided into three categories of experimental, quasi-experimental and non-experimental in terms of implementation. Finally, there are numerous strategies for the research: Traversal, content analysis, Grounded theory, ethnography, and so on.

Evaluation of the research hypothesis

Inferential statistical includes procedures using which we can generalize the information contained in the sample to the whole society. The most important objective of Statistics is carrying out inferences about characteristics of the society according to the information contained in the sample. A few statistical problems in end at each stage of descriptive statistics but most of the statistical problems include inferences about characteristics of a society from the information contained in the sample.

Evaluation of normality of distribution of variables (Kolmogorov-Smirnov test)

If we want to find out whether two or more samples have similar unknown distribution or not, it seems normal that their empirical distribution be compared with each other so that the similarities are determined. Kolmogorov – Smirnov is among statistical methods in which the maximum vertical distance between the distributions is used as a measure for the method of similarity. Since most of the parametric tests are based on normality of data. Analysis is done with this assumption that data distribution in a society in selected sample surface follows the mentioned society with a normal distribution. Thus, before statistical analysis and evaluation of variables, type of their distribution should be determined. Normality of the distribution data have been evaluated for this purpose using Kolmogorov-Smirnov test.

The rule of decision-making: we reject H_0 at the level of 95% if the significance level (sig) obtained from

Kolmogorov – Smirnov test is lower than $\alpha=0.05$. The hypothesis of this test are as follows:

- H0: data distribution is normal
- H1: data distribution not normal

Table 1: Kolmogorov-Smirnov test results for data distribution

	Management Information System	Financial performance	Competitive performance	Quality of Service	Employee Satisfaction
Kolmogorov-Smirnov statistic	0.613	0.262	0.751	0.524	0.664
Significance level (sig)	0.058	0.083	0.077	0.057	0.082
Test result	normal distribution	normal distribution	normal distribution	normal distribution	normal distribution

The significance level (sig) for variables of Information Management System, Financial performance, competitive performance, service quality and employee satisfaction has been respectively obtained to be 0.058, 0.083, 0.077 and 0.82 which are greater than $\alpha=0.05$.

Evaluation of the research hypothesis

The first hypothesis: management information systems have positive effect on financial performance.

- H0: management information systems have no effect on financial performance
- H1: management information systems have effect on financial performance

Table 2: Summary of model in the first hypothesis

The correlation coefficient	The coefficient of determination	Adjusted coefficient of determination	Standard uncertainty	Durbin – Watson statistic
.74	.54	.50	.26	1.68

According to the above table, the obtained coefficients of determination (0.56) shows that the independent variable (management information systems) covers 54% of the dependent variable (financial performance). Durbin – Watson statistic is used to evaluate the independence of errors. If the amount of Durbin – Watson statistic is between 1.5 and 2.5, the hypothesis of correlation between reject errors is rejected and Regression can be used amount of which has been 1.68 in this hypothesis which is between this ranges. Thus, the hypothesis of independence of error is an accepted.

Table 3: analysis (ANOVA) in the first hypothesis

Source of changes	Root set of deviations	Degrees of freedom (df)	Mean square (MS)	F statistic	The significance level (sig)
regression	.40	1	4.98	3.61	.028
Errors	608.46	383	1.58		
The total amount	609.44	384			

Based on the significance level (sig) in the above table and since this amount is lower than the level of probability of error ($\alpha=0.05$), the suitability of regression model is accepted which shows the significance of the linear equation.

Table 4: regression coefficients in the first hypothesis test

model		Coefficients in non-standard mode		Coefficients in standard mode	T-statistic	The significance level (sig)
		Beta coefficient	The standard deviation	Beta coefficient		
1	Constant factor	3.38	.16	-	20.59	0.000
	Management Information System	4.04	.51	2.04	3.78	.032
The correlation coefficient		The coefficient of determination	Adjusted coefficient of determination		Standard uncertainty	Durbin Watson statistic
.62		.39	.38		.22	1.70

The standard beta coefficient is equal to 2.04 in the above table which indicates that change of one standard deviation in management information system causes a change with standard deviation of 2.04 in the Performance Management. The significance level of t test for variable of management information system is lower than the level of probability of error ($\alpha=0.05$). Thus, the independent variable can affect the dependent variable. Thus, management information systems have positive effect on financial performance.

The second hypothesis: management information systems have positive effect on competitive performance.

H0: management information systems have no effect on competitive performance

H1: management information systems have effect on competitive performance

According to the above table, the obtained coefficients of determination (0.62) shows that the independent variable (management information systems) covers 62% of the dependent variable (competitive performance). Durbin – Watson statistic is used to evaluate the independence of errors. If the amount of Durbin – Watson statistic is between 1.5 and 2.5, the hypothesis of correlation between reject errors is rejected and Regression can be used amount of which has been 1.7 in this hypothesis which is between this ranges. Thus, the hypothesis of independence of error is an accepted.

Table 5: analysis (ANOVA) in the second hypothesis

Source of changes	Root set of deviations	Degrees of freedom (df)	Mean square (MS)	F statistic	The significance level (sig)
regression	3.32	1	4.32	3.21	.045
Errors	577.87	383	1.50		
The total amount	578.19	384			

Based on the significance level (sig) in the above table and since this amount is lower than the level of probability of error ($\alpha=0.05$), the suitability of regression model is accepted which shows the significance of the linear equation.

Table 6: regression coefficients in the second hypothesis test

model		Coefficients in non-standard mode		Coefficients in standard mode	T-statistic	The significance level (sig)
		Beta coefficient	The standard deviation	Beta coefficient		
1	Constant factor	3.27	.16	-	5.80	0.000
	Management Information System	3.022	.048	1.02	3.46	.005

The standard beta coefficient is equal to 1.02 in the above table which indicates that change of one standard deviation in management information system causes a change with standard deviation of 1.02 in the competitive Management. The significance level of t test for variable of management information system is lower than the level of probability of error ($\alpha=0.05$). Thus, the independent variable can affect the dependent variable. Thus, management information systems have positive effect on competitive performance.

The third hypothesis: management information systems have positive effect on service quality.

H0: management information systems have no effect on service quality

H1: management information systems have effect on service quality

Table 7: Summary of model in the third hypothesis

The correlation coefficient	The coefficient of determination	Adjusted coefficient of determination	Standard uncertainty	Durbin – Watson statistic
.53	.26	.25	.277	1.80

According to the above table, the obtained coefficients of determination (0.26) shows that the independent variable (management information systems) covers 26% of the dependent variable (service quality). Durbin – Watson statistic is used to evaluate the independence of errors. If the amount of Durbin – Watson statistic is between 1.5 and 2.5, the hypothesis of correlation between reject errors is rejected and Regression can be used amount of which has been 1.80 in this hypothesis which is between this ranges. Thus, the hypothesis of independence of error is an accepted.

Table 8: analysis (ANOVA) in the third hypothesis

Source of changes	Root set of deviations	Degrees of freedom (df)	Mean square (MS)	F statistic	The significance level (sig)
regression	23.63	1	4.63	3.38	.014
Errors	624.70	383	1.63		

The total amount	625.33	384			
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Based on the significance level (sig) in the above table and since this amount is lower than the level of probability of error ($\alpha=0.05$), the suitability of regression model is accepted which shows the significance of the linear equation.

Table 9: regression coefficients in the third hypothesis test

model		Coefficients in non-standard mode		Coefficients in standard mode	T-statistic	The significance level (sig)
		Beta coefficient	The standard deviation	Beta coefficient		
1	Constant factor	3.13	.16	-	5.83	0.000
	Management Information System	4.03	.051	2.03	4.62	.001

The standard beta coefficient is equal to 2.03 in the above table which indicates that change of one standard deviation in management information system causes a change with standard deviation of 2.03 in the competitive Management. The significance level of t test for variable of management information system is lower than the level of probability of error ($\alpha=0.05$). Thus, the independent variable can affect the dependent variable. Thus, management information systems have positive effect on service quality.

The fourth hypothesis: management information systems have positive effect on employee satisfaction.

H0: management information systems have no effect on employee satisfaction

H1: management information systems have effect on employee satisfaction

Table 10: Summary of model in the fourth hypothesis

The correlation coefficient	The coefficient of determination	Adjusted coefficient of determination	Standard uncertainty	Durbin – Watson statistic
.64	.40	.38	.29	1.65

According to the above table, the obtained coefficients of determination (0.4) shows that the independent variable (management information systems) covers 40% of the dependent variable (employee satisfaction). Durbin – Watson statistic is used to evaluate the independence of errors. If the amount of Durbin – Watson statistic is between 1.5 and 2.5, the hypothesis of correlation between reject errors is rejected and Regression can be used amount of which has been 1.80 in this hypothesis which is between this ranges. Thus, the hypothesis of independence of error is an accepted.

Table 11: analysis (ANOVA) in the fourth hypothesis

Source of changes	Root set of deviations	Degrees of freedom (df)	Mean square (MS)	F statistic	The significance level (sig)
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regression	5.27	1	4.27	2.76	.025
Errors	642.06	383	1.67		
The total amount	643.33	384			

Based on the significance level (sig) in the above table and since this amount is lower than the level of probability of error ($\alpha=0.05$), the suitability of regression model is accepted which shows the significance of the linear equation.

Table 12: regression coefficients in the fourth hypothesis test

model		Coefficients in non-standard mode		Coefficients in standard mode	T-statistic	The significance level (sig)
		Beta coefficient	The standard deviation	Beta coefficient		
1	Constant factor	3.008	.18	-	16.28	0.000
	Management Information System	4.04	.052	2.04	5.87	.011

The standard beta coefficient is equal to 2.04 in the above table which indicates that change of one standard deviation in management information system causes a change with standard deviation of 2.04 in the competitive Management. The significance level of t test for variable of management information system is lower than the level of probability of error ($\alpha=0.05$). Thus, the independent variable can affect the dependent variable. Thus, management information systems have positive effect on employee satisfaction.

Conclusion

The present era is the era of information and communication. The advent of computers in today's world has led to the emergence of post-industrial revolution in knowledge and communication and has created fundamental changes in the business activities and has made borders and physical distance to be as minimum as possible. Creating enough capacity to use information technology achievements requires provision of necessary infrastructures including hardware and software for effective management of information at organizational and national levels. Since National Company of oil rich areas have an important role in economic and social life of people. Information systems should be implemented for better and more access of managers to information related to performance of the organizations and factors affecting the financial and competitive performance of organizations as well as factors affecting employee satisfaction and improvement of their quality of services so that these information can be given to organization for better adaptation with changes of organizations using the related technologies.

Management information system is a science which is used for the same purpose which is information management. Undoubtedly, with the development of organizations and expansion of duties and responsibilities of the management, management decisions should always be based on technical and statistical studies and correct information and according to certain scientific principles and methods. So,

an adequate information system in organizations certainly will assist the organization and improve its performance.

With the comparison of the results of this research with similar researches, it is determined that the results of this research have common factors with previous researches. Implementation of management information systems which has been mentioned in previous studies as a factor to improve financial performance, competitiveness, and service quality and employee satisfaction (such as researches of Afzal et al, 2013 and DavoudFeiz and ...) also applies in the case of national companies of oil rich areas.

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