

The Extent of the Effect of Information System on the Quality of Executing the Information Technology Strategy from the Perspectives of the Managers of the Steel and Aluminum Corporations of Hormozgan Province

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Abstract

With the rapid development of information technology, introducing innovative strategies tailored to them has become an important research subject and a focal point. The aim of the present research is to investigate the role of the capabilities of information technology (IT) in the quality of implementing the strategies of IT from managers' perspectives. The statistical population of the study consisted of the managers of two large aluminum and steel corporations of Hormozgan Province in 2013. In order to collect necessary data for testing research hypotheses, a questionnaire was used. To analyze the data, the Kolmogorov-Smirnov test was used for determining their normality or abnormality; moreover, the correlation coefficient test and multivariate regression analysis were utilized in a stepwise manner using SPSS as the analysis of the course of action was conducted using AMOS22 for testing research hypotheses. The results indicate that there is a significant relation between the capabilities of the information system and the quality of executing information technology. Among these sharing capabilities, knowledge assumes the major role.

Keywords: The strategy of information technology, information systems, the capabilities of information system

Introduction

Focusing on knowledge and human reasoning and its ideas with a view to making use of idea and entrusting repetitive and non-creative affairs to machine as well as raising the efficiency and emancipating human skills,

Information technology has attracted special attention in recent decades. In recent years, a wave of using information systems has struck our country. Many organizations are inclined to use the information systems; conversely, what are increasingly coming to the fore are the growing development of technology and the development of super industrial societies by means of information and its significance in making strategic decisions. The information technology allows for the usefulness and effectiveness of information. The application of information technology has made the transmission of data, documents via computer and communication lines facilitated (Ibrahimi, 2001). With groundbreaking innovations in IT and the rapid development of information systems, companies stressed the development of technology strategies with a view to developing business. Many companies have come up with the strategies of innovative information technology and the applied programs of business so as to improve competition and the evolution of their own companies (pai and Yeh, 2008).

On the contrary, the term "ability" refers to the potential of a company for using the processes of companies concerning on the allocation and application of resources (Yeh *et al.* 2012). If an organization is devoid of institutional competence or the capabilities of information systems, the implementation of the IT strategies have side-effects.

A vast array of studies revealed that organizations put an emphasis on directing production via the strategies of IT in order to use a strategic planning for information systems (Barney, 1991). Today, managers cannot disregard the effects of technology and information systems on organizations. Information technology has a great impact on all dimensions of organizations. The raise of information technologies has made the information sys-

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tems of organization and the technologies used by them take a decisive role in fulfilling organization obligations. Although many companies avail themselves of robust programs to use information systems, few of them are able to convert the strategies into practice. Therefore, implementing the strategies of information technology is a focal point as to information management in industry and universities, so capability is regarded as a crucial source; yet few studies have approached the implementation of strategy based on capability view. Thus, the article addresses the consequences of implementing information technology and it sets out to review the existing studies and programs relevant to the capabilities of information systems with respect to discovering the capability of a continuous relation between information system and the quality of implementing the IT strategy.

Review of the literature

Implementation of IT strategy

Information technology is a combination of communicational achievements, methods, and the strategies of problem solving, and the strategic abilities using computer knowledge. Moreover, it consists of subjects related to the advanced discussions of technology science, computer design and its applications. Additionally, it is an overall term used for expanding products and electronic services derived from communicational and computer innovations. The IT strategy is to build up a design for introducing information systems and coordination related to investment in IT in order to delineate programs, information resource, human source, organizational management and the subjects related to presenting information systems (Yeh *et al*, 2012). In the past, companies often used a method of developing an information system strategy as applied it to establishing information system and the strategies of information technology. For example, Pan and Lee (2000) developed a five-stage management model of information system strategy, which consisted of the stages setting up strategies for companies, finding strategic opportunities for using the design of the information system framework, establishing and implementing system, evaluating the strategic effects of information systems on competition. Chan (2005) came up with a framework for big companies to promote strategies and the programs of information system; it is primarily based on the integration of business needs and optimization of the value chain. The limit of electronic activities involve electronic business, planning for investment resources, managing supply chain, managing customer relationship, managing knowledge and the like. Therefore, when implement-

ing business, a company should bear in mind the major abilities and its domestic resource to complete programming and implementing IT strategy so as to enter new economic courses (El nehas, 2006). Our results indicate that user participation and responsibility in implementing the strategy is a key factor in executing the IT strategy. Theo and Ang (2001) stated that the programming of the information system involve three stages: commencement, program development and its implementation; as for the implementation, the problems with the strategic programming of information system include the one with taking on management commitment at top level to execute the strategy, the mastery program of information system which is currently developed, and the failure to use one program as one standard of evaluating management performance. Salma and Spill (2002) stressed the importance of strategic implementation and strategic formation of information system and implementing the method within four courses. The quality of executing the IT strategy greatly impacts on the function of business. Furthermore, companies paid attention to the factors such as IT, budgeting, and allocating resources in order to achieve strategic goals. They regard IT strategy as overall maps of resources, creating architecture of organizational IT for constructing information systems. Therefore, organizational competition has gained momentum to some extent. If the IT strategy can be executed effectively, it leads to a better performance of an organization (Pie and Yeh, 2012). In short, it is essential for the programs of information systems to come up with a thorough information technology cover. Meanwhile, effectively executing the IT strategy calls for a help to achieve business goals. As a result, the improvement of the IT strategy implementation and discovering factors affecting the quality of executing the IT strategy are incorporated into the central discussions of the research.

The capabilities of Information System

Considering the view based on resources, companies are a combination of assets and capabilities. The competitive advantage is achieved by the accumulation of assets and strategic capabilities. Therefore, the view indicates that the exclusive possibility of assets and companies' capabilities allow them to take over their own competitive advantage in this regard. All the successful companies use the exclusive capabilities and resources effectively only when the organization grows as well as creating rooms for them in the market (Barney, 1991). To execute the IT strategy, companies should be able to allocate sufficient resources for executing the strategy and make sure that the programs can be effectively fol-

lowed. Ravichandran and Lertwongsatien (2005) believe that the firms with the higher capabilities of information system are able to offer the IT services to the entire organization. With respect to business, companies are designing suitable strategies due to the direction and trend of the future development completion. Executing a strategy is associated with market changes; however, it depends on the ability of the whole organization. Therefore, the capabilities of the organizational development of the information technology are one of the vital duties of a business (Patrakosol and Lee, 2009).

The results explained by researchers are indicative of an effect that the capabilities of the information system on the competitive advantage of an organization and the central competency and the function of business. However, a few research-based studies have conducted on the quality of executing the IT strategy and the effect of the capabilities of information system on the strategy. As a result, the study is a combination of measuring the ability of the information system capabilities and the effects of these capabilities on the quality of executing the IT strategy.

Research background

In their study, Yeh *et al* (2012) stated the abilities of information systems in six items; leadership, resource allocation, cooperation, knowledge sharing, system development and project management—these strategies have great and positive effects on the implementation of information technology with respect to the E-business of Taiwan's largest companies as they substantially increase the competition for the organization. Peppard *et al* (2000) came up with a conceptual framework to set the capabilities of an information system including strategy, a description of the contributions of information systems, a description of the abilities of IT, utilization, providing solutions. Pepard and Ward (2004) developed the item related to the organizational capability of information system, which used six structures as the basis for integrating firm resources. Their studies stressed the importance of information system ability to execute the IT strategy with a view to conducting business. Other researchers reviewed the organizational capabilities of information system from the perspective of information resource management, knowledge management, the IT project management, and its leadership (Ciney and Johnson, 2005; Khatri, 2006). The literature shows that a wide range of factors overshadowed by the capabilities of information system. When an organization begins to transact business, it taps into the IT related to coordination, inte-

gration and sharing information for carrying on various business tasks (Langdon, 2006).

In addition to this, companies should employ the programs of project management and the ability of developing system for successfully presenting the programming of investment resources and companies should make a decision whether they can engage in outsourcing and/or they can develop their systems (Nah *et al*, 2007, Nah and Delgado, 2006). Lee and Bai (2003) suggested that we can employ interactive learning at individual, group and organizational level to improve the effectiveness of planning when conducting the strategic planning of the information system in the digital age. Effective organizational learning process, business integration, programs, processes, and vast organizational structures for creating operational models, and eventually the improvement of innovation and the capability to respond within an organization allow the organization to move toward e-business (Cegarra *et al*, 2007).

Research hypotheses

Gottschalk (2002) believed that chief information officers are much the same the project managers engaging in the strategic planning of information system, they are responsible for developing programs and assume major role in the process of planning. In fact, chief information officers are much the same senior managers responsible for information systems and information technology in an organization. Therefore, when organizations conduct the strategic planning of an information system, the chief information officers take on a duty to help the major elements of a section understand the fulfillment of a strategic role via information system/information technology in a competitive environment. Indeed, they need to equip the predicted effects of presenting new information system/information technology on the architecture of organization information technology, creating self-confidence for users to manage information systems and build up a sense of trust (Yeh *et al*, 2012). As a result, we come up with the first hypothesis as follows:

H1: The capability of information system leadership has a significant relation with the quality of executing information technology. With the promotion of e-business and increasing importance of IT, the configuration of IT resources such as hardware information, communicative networks can have a significant impact on the strategic planning of the information system (Chan, 2005).

In the process of a strategic planning of information system, senior director has planning in order to make

sure that the information technology resources are properly allocated. In addition to this, managers should be able to prioritize the investment in information technology and spread potential risks (Bird *et al.*, 2006). In short, managers should not only be able to understand the allocation of an organization's information technology resources, they also should view IT as an investment in and evaluation of business interests.

H2: The capability of allocating resources has a significant effect on executing the IT strategy.

The group level capability: In a high competitive environment, organizations stressed the division of work and specialization with a view to improving the overall performance and practicing individual duties. Nonetheless, when self-operating segmentation begins to expand its position across the different departments, the organization would incur damage. As a result, the coordination and adjustment of the mechanisms is meant for encouraging partnership between departments, and even it is more important than the development of e-business (Sanders and Primus, 2005). Therefore, besides controlling and integrating and allocating organizational resources, businesses with better coordination capability are able to use their resources which are appropriate to improve organization performance.

H3: The capability of the cooperation has a significant effect on the quality of executing the IT strategy.

With an interaction with the strategic planning of the information system, organizations may engage in planning using team training, focused interviews and special reports by a representative in each department, besides setting up short-lived planning team. Pai (2006) pointed out that the strategic planning of the information systems requires the integration of different types of knowledge about information systems/information technology and the knowledge of doing business. Therefore, it is essential to share the knowledge among the members involving in planning. The transfer of optimized operational capabilities is necessary in order to create competitive advantages for companies. To achieve the objectives of the IT strategic planning, sharing knowledge is very crucial. Moreover, it is of importance to effectively transfer knowledge to different parts of an organization.

H4: the ability to share knowledge has a significant impact on the quality of the implementation of the IT strategy.

The organization level capability: Developing an information system is a fundamental task in determining the quality of information systems. When developing an information system, organization needs to expand

its suitable information system with respect to its needs for developing limited resources. As e-business is conducting, an information system can be either developed internally or through outsourcing. Both methods have the pros and cons. It depends on the capability of developing an information system in each business as to which method should be chosen (Yeh *et al.* 2012).

H5: the capability of developing system has a significant impact on the quality of the IT strategy implementation.

An increase in the complexity of information system has been conducive to a change in demand and the involvement of external variables and made the business projects failed. Therefore, the implementation of project management is a critical factor for the success of an information system (Yeh *et al.*, 2012). The factors such as people, technology, resources, timetables and risks need to be prioritized in order to make sure that the objectives can be achieved as the plans are being implemented; for this aim, the need to perform an effective project management matters most.

H6: The capability of project management has a significant impact on the quality of executing the IT strategy.

Materials and Methods

Research methodology, data collection instrument and information analysis

The research method used in this study is of an applied nature based on its objective, so the researchers sought to employ strategies for the improvement of the quality of the IT strategy implementation. Based on how data collection was conducted, the research method is to survey, i.e. the researcher intended to explain the role of the information system capabilities in the quality of the IT strategy implementation by collecting necessary data. The statistical population involved the entire managers of the Steel and Aluminum Corporations of Hormozgan Province in 2013; it involved 88 persons. Because of the limitation of the population, there was no need to do sampling. In this article, former research and library studies were utilized to collect theoretical principles and the research literature. The questionnaire consisted of six questions pertaining to demographic variables and 25 closed questions with likert responses (1= strongly disagree to 5= strongly agree) and pertaining to the research hypotheses. The questions 1 to 6 are related to demography, the ones from 7 to 13 are pertained to the quality of the IT implementation, dependent

variable, and the questions 14 to 31 are related to the capabilities of information systems.

In order to validate the questionnaire in this research, the researcher handed out it to a number of Management professors as well as the researchers and managers in the organization and applied their comments to it. Therefore, the questionnaire used in this research is endowed with necessary validity. As for the assessment of the questionnaire reliability,

the Cronbach alpha was used along with SPSS 19. The Cronbach alpha extracted for the present questionnaire stood at 0.80, which indicates an acceptable reliability.

Results

Table 1 shows the frequency and frequency percentage of the research demographic variables.

Table 1. Descriptive statistics for demographic information

Demographic Variable	Subgroup	Number	Frequency	Frequency Percentage
Sex	Male	88	71	80.7
	Female		17	19.3
Age	Up To 30 Years Old	88	9.1	9.1
	30 To 40		34.1	25
	40 To 50		68.2	34.1
	50 And Above		100	31.8
Education	Diploma And Associate Degree	88	7	8
	Undergraduate		33	37.5
	Graduate		35	39.8
	Doctorate		13	14.8

Testing research hypotheses

The data were, in the first place, collected and distilled and then its normal state (or abnormal

state) has been examined. To test the normality, the Kolmogorov – Smirnov test was employed. The results are presented in table 2.

Table 2. The results of the Kolmogorov – Smirnov test for the research data

	Information technology	leadership	Resource allocation	cooperation	Knowledge sharing	System development	Project management
Kolmogorov-Smirnov Z	1.671	2.431	1.876	2.037	1.721	2.120	0.005
Sig.	0/008	.000	.002	.000	.005	.000	

Considering the results of table 2, the significance level (Sig.) of all the variables was less than 0.05. Therefore, the null hypothesis is ruled out and the opposite hypothesis is confirmed. Hence, we can say that the distribution of the data obtained from the research questionnaire is abnormal. As a result, the Spearman correlation coefficient was used.

The path analysis diagram

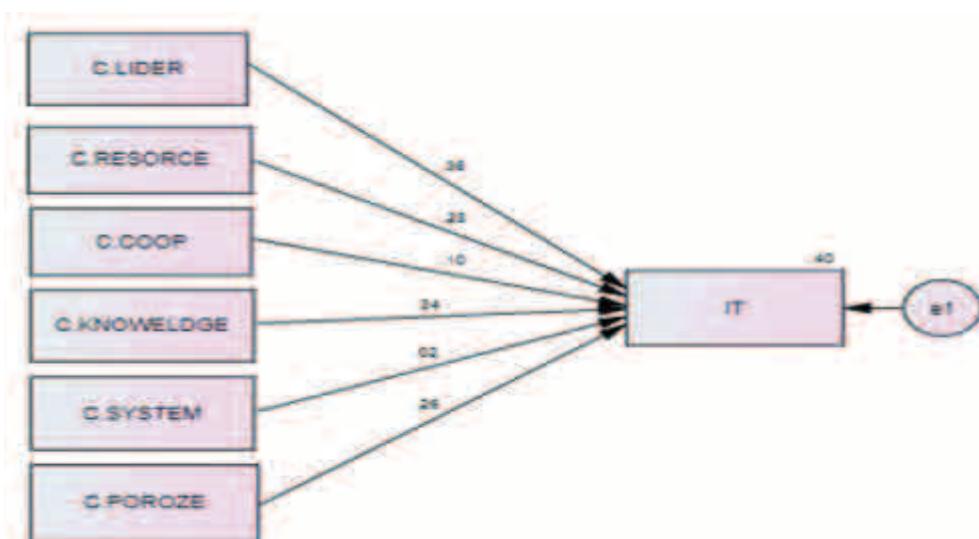
In this research, in order to test the research hypotheses and clarify the role of each capability

of an information system in the quality of the IT strategy implementation, the path analysis diagram was used through AMOS 22 software and multiple regressions in a stepwise manner. In this analysis, the capabilities of an information system were considered as predicting variable and the quality of the IT strategy implementation was taken as standard variable. It should be noted that the order of variable insertion is based on correlation coefficient in the stepwise regression.

Table 3. The Spearman correlation coefficients between the research variables

	1	2	3	4	5	6	7
Strategy implementation	*						
Leadership capability	0/551**	*					
Resource allocation capability	0/571**	0/337**	**				
Cooperation capability	0/508**	0/422**	0/336**	*			
Knowledge sharing capability	0/651**	0/464**	0/502**	0/565**	*		
System development capability	0/481**	0/387**	0/508**	0/544**	0/423**	*	
Project management capability	0/532**	0/215*	0/450**	0/442**	0/537**	0/440**	*

The correlations at the levels 0.01 and 0.05* are significant

**Figure 1. The path analysis diagram**

Given the path analysis diagram and the information of table 4, H_1 and H_2 , at the individual level revealed that the capability of leadership and managers resource allocation has a significant effect on the quality of the IT strategy implementation. Therefore, the study suggests that managers are able to combine information technology with the strategies of the organization as well as understanding and using the organization information resources with a view to facilitating executing programs with the aim of a better management of information system and a better allocation of resources concerning the process of planning and executing the IT strategy. At the group level (H_3 and H_4), the results of the analysis indicate that the capability of sharing knowledge has a remarkable effect on the quality of the IT strategy implementation in the organizations in question. Yet the capability of cooperation has no significant effect on the dependent variable. Therefore, an integration of ideas as well as boosting the unit interrelationship in organization is necessary. The planning and executing the IT

strategy via a single person cannot be accomplished and organization should emphasize the cumulative efforts and sharing knowledge among people. In the end, at the organizational level (H_5 and H_6), the results of the research demonstrate that the capability of the project management has a substantial effect on the quality of executing the IT strategy.

The results of the stepwise regression

The results of the stepwise regression show that the independent variables entered into the model explain a total of about 61% (R^2) of the changes of the dependent variable. Given the statistics of table 5, it can be claimed that the multiple correlation coefficient (R) equals to 0.611, so the variables of the sharing knowledge capability, leadership capability, project management capability and resource allocation purely explain 61% of the variance of the quality of IT strategy implementation, the remaining variance can be explained by external and unknown factors excluded from the research. In this

regression model, the most important factor which is the most contributing one than other ones is the sharing knowledge capability. Additionally, the results of the variance analysis given the value of F statistics and the

significance level (less than 0.05) show that the explanatory variables are significantly able to forecast and explain the changes of the dependent variable, the quality of the IT strategy implementation.

Table 4. The output summary of the path analysis diagram using the software AMOS 22.

Hypotheses	Sig	C.R(T)	Standard Deviation	Path correlation	Interpretation
H1: leadership capability → the quality of the IT strategy implementation	0.000	4/27	0/05	0/36	Confirmed
H2: Resource allocation capability → the quality of the IT strategy implementation	0.000	3/32	0/053	0/28	Confirmed
H3: Cooperation capability → the quality of the IT strategy implementation	0.209	1/25	0/065	0/10	Not confirmed
H4: Sharing knowledge capability → the quality of the IT strategy implementation	0.000	4/04	0/062	0/34	Confirmed
H5: System development capability → the quality of the IT strategy implementation	0.797	0/25	0/058	0/02	Not confirmed
H6: Project management capability → the quality of the IT strategy implementation	0.002	3/13	0/053	0/26	Confirmed

Table 5. The stepwise regression of each share of the information system capabilities of the quality of the IT implementation

Stage	variables	Model summary		Anova		Coefficients	
		R	R ²	F	sig	T	sig
1	Sharing knowledge capability	0/657	0/431	65/20	.000	8/07	.000
2	Sharing knowledge capability Leadership capability	0/714	0/510	44/32	.000	5/94 3/71	.000 .000
3	Sharing knowledge capability Leadership capability Project management capability	0/759	0/576	38/03	.000	3/80 4/14 3/60	.000 .000 .001
4	Sharing knowledge capability Leadership capability Project management capability Resource allocation capability	0/782	0/611	32/57	.000	3/26 3/93 2/81 2/72	.002 .000 .006 .008

Discussion and conclusion

Generally speaking, the results of the research hypotheses indicate that the leadership capability and the resource allocation capability at the individual level, the sharing knowledge capability at the group level and the project management capability at the organizational level take on the most roles in this regard. That is to say, at the individual level, managers are better able to combine resources with organization informa-

tion technology by a better management of information systems and a better allocation of resources with respect to the process of planning and executing the IT strategy. At the group level, the interrelationship and cooperation as well as the integration of ideas are necessary. In fact, organizations rely on cumulative efforts and sharing knowledge among members.

In the end, at the organizational level, companies should develop and introduce different information systems with respect to the process of system develop-

ment. A company, in the process of doing business, may confront a variety of problems including the high cost of presenting, long-term planning, and the failure to integrate systems and/or the flexibility of the system process. Therefore, to avoid the foregoing circumstances is to give priority to project management in companies.

The results of the study can help managers understand the current status of executing the IT strategy for the activities of the Corporations, Hormozgan Steel and Aluminum, and even in terms of doing business with a view to reviewing the different effects of the information system capabilities on the process of executing the IT strategy at the individual, group and organization level. The information can facilitate the programming of the strategic development of IT through businesses on a track to execute the IT strategy in the future. The article comes up with three suggestions for all companies; the first, which is revolving around the individual level capabilities, states that the promotion of the leadership capability and resource allocation capability by managers will be effective in a company performance. The second, the sharing knowledge at the group level can bring in innovation for company knowledge, in which case, it should be reinforced by companies. In the end, given the abilities at organization level, the capacity of developing system and the project management capability are among the key factors in business when it comes to presenting electronic systems. As a result, the strategy of information system can substantially improve the performance of an organization if effectively implemented in companies.

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