The impact of management information system on organizational agility in Ilam Telecommunication Company, Ilam province, Iran

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Abstract- Introduction: today, globalization and transition from the businesses to the digital economy have made the use of information and information systems substantially more essential ever since. This study investigated the effect of management information systems (MIS) on agility. **Methods:** This study was cross – sectional (descriptive). 150 employees of Telecommunication Company of Ilam with bachelor's degree or higher entered this study. Data collection was done by using two questionnaires, MIS questionnaire and organizational agility questionnaire. Validity and reliability of these questionnaires were confirmed. Data were analyzed using descriptive and inferential statistics by SPSS, version 21. **Results:** according to this study, a significant relationship was found between all studied MISs and Competency and agility, and that there was a statistically significant relationship between strategic information and structured decisions systems in term of accountability, but this relationship was not significant between accountability and decision support systems. Also there was a positive significant relationship between accountability and structured decision support systems. However, no significant relationship between accountability and strategic information systems and decision support systems was observed. **Conclusion:** Information technology (IT) and its features such as MISs are tools which are used to improve company's overall efficiency in a highly unstable and competitive environment. Private and public organizations need to focus on this component in respect to (in regard) the unstable and competitive conditions within the organization.

Introduction

Today, many firms and organizations face increased competitiveness resulted from technological innovation and changing market conditions as well as changing customer requirements. This critical condition caused fundamental changes to the preferences, strategic perspectives and statements in a growing competitive market and the improvement of the organizational flexibility and Accountability (1). Under such unstable conditions, firms must be able to manage the changes, eliminate the threats and benefit from opportunities. Accordingly, organizational agility is defined as the organization capability to rapidly change or adapt in response to changes, unreliable environment and less predictive conditions (2). The key characteristic of an agile organization is to rapidly respond to events and environmental changes to an extent to which the integrity of information systems, technology, individuals,

commercial processes, and materials within the harmonic organizations are maintained. Hence, agile organization as a Paradigm of 21st century has attracted a lot of attentions, and as a successful strategy in competitive markets, it rapidly changes in response to the customer's needs (1). Organizational agility plays an important growing role in today's changing world. Many experts claimed that "the most successful companies are those that are faster and more agile" (3).

An agile organization is a fast, adaptable and informed business with fast adaptability in response to changes and unexpected and unanticipated events and the market opportunities and customer needs. .In such businesses, processes and structures will be found that can be facilitates speed, adaptability and strength, also it belongs a coordinate and ordering organization which has ability to achieve competitive performance in the business environment , and of course this

environment with current functions is not proportionate.

The main goal of an agile enterprise is to enrich and appreciate employees and customers by its unique capability to appropriately respond to the workplace changes. However, work conditions which involve most companies, are characterized by unstable and unexpected demands, and simply enforcing the need to pursue the agile. Thus, the most critical stimulus connected with agile is change. Even if the change is not a new issue, at the present, changes and evolutions happen excessively faster than in the past. Primarily, agile enterprises do not only focus on the adaptability to changes, but also they think bigger and tend to benefit potential opportunities in a chaotic environment, and consequently achieve a viable career success. To satisfy customers needs, agile organizations not only provide products/services, but also introduce mechanisms by which customers real needs are met. This keeps the agile organizations out of reach of other rivals (5).

Agile organizations are concerned with changes, lack of trust, and absence of anticipation in the workplace. These organizations need a number of various capabilities to investigate and manage the change, miss trust and absence of predictive capability in the workplace. These capabilities include four major elements, which are taken into account as contributors to properly maintain and develop agility. These elements are Accountability, Promptness, flexibility and Competency and eligibility(1).

On the other hand, at the present, globalization and business transition into a digital economy have made the use of information and information systems substantially more essential ever since. Until now, the value of information as a major property of the organization has been unknown and in most organizations and enterprises, information was thought of as an adverse and costly phenomenon. But today, managers barely ignore the way in which organizations confront to the information (6).

The important role of technology and information systems in supporting the current and future operations of organizations has been well understood. The key feature of an agile organization is to rapidly respond to events and environmental changes to an extent to which the integrity of information systems, technology, individuals, commercial processes, and materials within the harmonic organizations are maintained (7).

Information technology (IT) supports current programs, provides information communication and reduces the costs within the organization.

Information technology positively influences the organization performance, and also affects the potential performance of the enterprises and introduces a mechanism to effectively store; access and share information.MIS is one of the most important information systems in an organization. MISs is systems that assist the managers to monitor and pursue the current tasks and the sequence of the works performed within the organization, as well as predicting the future condition to take the proper action in the meantime.

Originally, MISsis classified into three categories:

1. Structured decision systems: Structured decision systems make structured decisions.

2. Decision support systems: Decision support systems mainly support semi-structured and structured decisions

3. Strategic information systems: These systems merely support unstructured and strategic decisions (9).

Given these measures mentioned above along with the social needs to have agile organizations which adapt themselves properly to changes, and the important role of information and information systems in competitive advantage as well as establishing an agile organization in both manufacturing and service areas, the present study examines the influence of information systems which are under control of managers, on the capabilities and features that make the term "agility" meaningful.

Methods:

This paper, objectively speaking, is a practical study, and could be considered as a survey, because it used questionnaires to collect data. The samples include employees of Telecommunication Company of Ilam. 250 employees work in this company from which 150 employees had BA or higher certificate. Since the target population was very limited, all 150 employees were chosen as the statistical samples of the present study. To collect data, two questionnaires, MIS questionnaire and organizational agility questionnaire were used. MIS questionnaire was a 19-item researcher-Made questionnaire and was validated by masters and Specialists and the reliability of this survey was approved after completing 30 questionnaires by 30 participants, and the Cronbach's alpha calculated for the questionnaire was 0.71. In this questionnaire, three measures were questioned including Strategic information systems, Decision support systems and structured decision systems. Organizational agility questionnaire was derived from Zhang & Sharifi questionnaire which was a standard 29-item questionnaire (10). In this questionnaire four measures were examined including accountability, promptness, flexibility and Competency. Data were statistically analyzed using descriptive and inferential statistics and SPSS, version 21. Finally, statistical methods showed whether there is a statistically

significant relationship between MIS indicators and agile indicators exists.

Results:

According to the results, we found that of the 150 samples, 10 subjects (6.7%) were Senior Managers, 40 (26.7%) middle level managers, 95 (63.3 %) experts, and 5 subjects (3.3%) were educators.

In term of education level, 15 (10 %) had PHD, 40 (26.7) M.S and 95 subjects (63.3%) had BA certificate. In term of gender, 115 subjects (76.7&) were male and 35 subjects (23.3) were female.

Before going further, things that must be taken into account most are issues concerning the formulation and examination of statistical hypothesis. Assumptions which are taken into account by correlation coefficient and regression analysis include hypothesis of normality by using Kolmogorov-Simonov statistical test. This examination was carried out on variables that entered the model (table 1).

Results represented in the table demonstrate that significance level measured by KS-test was less than p-value (0.05). We found that the distribution of examined variables was normal. Also we examined the research components by Pearson correlation coefficient and regression analysis.

Examining the relationship between MISs and accountability by multivariate regression coefficient, showed a significant linear relationship between independent variables and accountability (R=0.574). And independent variables predicted (33 %) the variation of the dependent variable, accountability. Also since the resulted significance level (p=0.0001) was less than the expected significance level (0.01), thus there was a linear significant relationship between these variables (99% confidence level).

Table 1. Investigate the assumption of the normal distribution of variables

Statistical index / Related variable	Kolmogorov-Simonov Z	p.value
Strategic information system	0.89	0.39
Decision support system (DSS)	0.55	0.92
Structured decision system	0.61	0.84
promptness	0.73	0.65
Competency	0.18	0.12
Accountability	0.71	0.69
flexibility	0.61	0.84
Organizational agility (total score)	0.73	0.65

Table 2. Result from multivariable regression coefficient (first hypothesis)

Statistical Index / Criterion variables	R	Coefficient of Determination R2	Adjusted R2	Significance level (P)
Accountability	0.574	0.33	0.316	0.0001

Table 3. Results from regression analysis test in regard to coefficient of each independent variable related to relationship between MISs and accountability

0.25(strategic information) - 0.24 (decision support) + 0.31 (structured decisions) +11.008 (accountability)= Y				
Explanatory variable	**Variable coefficient**	**T-statistic**	**P-value**	**VIF**
Residual value (a)	11.008	5.054	0.0001	
Strategic information system	0.252	3.464	0.001	2.378
Decision support system	-0.247	-1.603	0.111	1.583
Structured decision system	0.318	2.999	0.003	2.603
F-statistic	23.94			
P-value	0.0001			
Durbin-watson	1.92			

Results from VIF and Durbin-Watson statistic, support then on collinear hypothesis and non-autocorrelation hypothesis of the variables.

As it is illustrated in table 3, t-statistic for strategic information system and structured decision system variables was significant (p=0.05). Since the resulted significance level for each variable was less than criterion variables (0.05). F-statistic=23.94 and p-value= 0.0001 suggested that this association was significant (0.01). Adjusted R2 coefficient showed

that explanatory variables can explain 31.60 % of total variation in accountability. Moreover, results showed that the independent variable, decision support system may not predict the accountability (significance level=0.05). As a result, there was a significant difference between strategic information and structured decision systems and accountability (significant level=0.05).

Examining the relationship between MISs and accountability as shown in table 4, showed that using the multivariate regression coefficient, a significant linear association between independent variables and competency was found (0.764), and independent variables may predict 58.4 % of the variation in dependence variable, competency. Also as the observed significant level was less than criterion significant level (0.01), thus there was a significant linear association between these variables, and the confidence level was 0.99.

Table 4. Results from multivariate regression coefficient in second the hypothesis

Statistical Index Criterion variables	R	Coefficient of Determination R2	Adjusted R^2	Significance level (p)
competency	0.764	0.584	0.575	0.0001

Results from Durbin-Watson and VIF statistics presented in table 5, support the non collinear hypothesis and non-autocorrelation hypothesis of the variables.

T-statistic for strategic information system, decision support system, and structured decision system variables with competency was significant (p=0.05). Since the resulted significance level for each variable was less than criterion variables (0.05). F-statistic of 23.94 and p-value equal to 0.0001 suggested that this statistic was significant (0.01). Adjusted R2coefficient showed that explanatory variables can explain 57.5 % of total variation incompetency. As a result, there was a significant difference between MISs and competency (significance level=0.05).

Table 5. Results from regression analysis test by coefficient of each independent variable related to the relationship between MISs and competency

0.29(strategic information) - 0.52 (decision support) + 0.24 (structured decisions) +4.90 (competency)= Y				
Explanatory variable	Variable coefficient	T-statistic	P-value	VIF
Residual value (a)	4.903	2.617	0.01	
Strategic information system	0.293	4.673	0.0001	2.378
Decision support system	0.524	3.954	0.0001	1.583
Structured decision system	0.242	2.65	0.009	2.603
F-statistic	68.31			
p-value	0.0001			
Durbin-watson	1.90			

Examining the relationship between MISs and flexibility as shown in table 4, showed that using the multivariate regression coefficient, a significant linear relationship was found between independent variables and flexibility (0.343), and independent variables may predict 11.8 percent of the variation in competency. Also as the observed significant level was less than criterion significant level (0.01), thus there was a significant linear relationship between these variables, and the confidence level was 99 percent.

Table 6. Result from multivariable regression coefficient (third hypothesis)

Statistical Index Criterion	R	Coefficient of Determination R^2	Adjusted R2	Significance level (P)
Flexibility	0.343	0.118	0.10	0.0001

Results from Durbin-Watson and VIF statistics presented in table 7 support the non-collinear hypothesis and non-autocorrelation hypothesis for the variables.

T-statistic for structured decision systems variables was significant (p=0.05). Since the resulted significance level for each variable is less than criterion variables (0.05). F-statistic of 6.49 and p-value equal to 0.0001 suggested that this statistic was significant (0.01). Moreover, results showed that independent variables as decision support systems and strategic information systems were not able to predict the flexibility (significance level=0.05).Adjusted R2coefficient demonstrated that explanatory variables

may explain 10.0% of total variation inflexibility. As a result, there was a significant difference between structured decision systems and flexibility (significant level=0.05).

Examining the relationship between MISs and promptness, as shown in table 4, showed that using the multivariate regression coefficient, a significant linear relationship was seen between independent variables

and promptness (0.835), and independent variables may predict 69.80 percent of the variation in dependence variable, promptness. Also since the observed significant level (0.0001) was less than criterion significant level (0.01), there was a significant linear association between these variables, and the confidence level was 99 percent.

Table 7. Result from regression analysis test in regard to coefficients of each independent variable in the third hypothesis

0.05(strategic information) - 0.108 (decision support) + 0.279 (structured decisions) +24.94 (flexibility)= Y				
Explanatory variable	Variable coefficient	T-statistic	P-value	VIF
Residual value (a)	24.949	10.748	0.0001	
Strategic information system	0.055	0.712	0.478	2.378
Decision support system	-0.108	-0.657	0.512	2.603
Structured decision system	0.279	2.47	0.015	2.603
F-statistic	6.49			
p-value	0.0001			
Durbin-watson	1.95			

Table 8. Result from multivariable regression coefficient (the forth hypothesis)

Statistical Index Criterion variables	R	Coefficient of Determination R2	Adjusted R^2	Significance level (p)
competency	0.835	0.698	0.692	0.0001

Durbin-Watson and variance inflation factor (VIF) statistics results presented in table 9 support the non collinear hypothesis and non-autocorrelation hypothesis for the variables**.**

T-statistic showed a significant association between strategic information systems, decision support systems, and structured decision system variables and the promptness (p=0.05). Since the

resulted significance level for each variable is less than criterion variables (0.05). F-statistic of 112.32 and p-value equal to 0.0001 suggest that this statistical relationship was significant (0.01). Adjusted R2coefficient showed that explanatory variables can explain 69.20% of total variation of promptness. As a result, there was a statistically significant difference between MISs and promptness (significant level=0.05).

Table 9. Results from regression analysis test in regard to coefficients in each independent variable (4th hypothesis).

0.05(strategic information) - 0.108 (decision support) + 0.279 (structured decisions) +24.94 (flexibility)= Y				
Explanatory variable	Variable coefficient	T-statistic	P-value	VIF
Residual value (a)	24.949	10.748	0.0001	
Strategic information system	0.055	0.712	0.478	2.378
Decision support system	-0.108	-0.657	0.512	2.603
Structured decision system	0.279	2.47	0.015	2.603
F-statistic	6.49			
p-value	0.0001			
Durbin-watson	1.95			

Conclusion

According to the tables and analysis represented in this paper, we found that there was a significant relationship between all MISs discussed above and factors such as promptness and competency; however this relationship was significant between strategic information systems and structured decision systems in regard to accountability. But this relationship was not

significant between accountability and decision support systems. Also a positive significant relationship between accountability and structured decision support systems was observed. However, no significant relationship was seen between accountability and strategic information systems and decision support systems. Results suggest that, MISs can predict variations of agility components as follow:

Table 10. The prediction value of agile components by MISs

Raw	Organizational agility components	Multivariate regression coefficient	Adjusted R^2
1	Promptness	69.80	69.20
2	Competency	58.4	57.5
3	Accountability	33	31.60
4	Flexibility	11.80	10

The efforts made by researchers in this study suggest that a study, in which the MISs including strategic decision systems, decision support systems and structured decision systems in regard to four capabilities of the organization as Promptness, competency, accountability, and flexibility are examined, does not possibly exist. But some studies have been carried out in this domain that in part revealed same results. Some of these works are as follow.

Beyginia et al. proposed the relationship between IT acceptance and agility of the organizations in National Iranian Petrochemical Company. Goldman et al stated that, presence of decision support systems has a substantial effect on the agility of the organization (11). Gunnison AO and Mondragon suggested that it is critical to use modern information systems to eventually establish an agile firm (12, 13). Gunasekaran proposed that information systems need to design and develop decision support system software to plan, and monitor inventory of the organization including planning, product design, resource planning, and time management of manufacturing processes (14). Zanjirchi, also proposed that all aspects of technology are significantly linked with organizational agility (15). Alzoubi and lu found that there is a strong significant relationship between IT and information systems as one of the most important and efficient factors of organizational agility (16,2)

Mohamadi stated that tendency, lack of resistance, and commitment level of senior managers within the organization are considered as the most fundamental components to achieve organizational agility through application of Information technology (17)

A review of other studies showed that the strength of the association between agility capabilities and the application of IT in the organization was relied on Promptness, competency, accountability, and flexibility, respectively. These findings were similar to the present study (18).

Fathian & sheikh concluded that unlike the findings of the present study, within service organizations, the effect of IT on Effective communications inside and outside the organization as well as a rapid response to environmental and market

changes are stronger than other factors concerning agility (19).

This survey suggests that, IT and its features including diverse information systems are applied as tools to enforce organizations and firms to confront and deal with changes in an excessively competitive and changing environment. Although, there would be many measures for change management and exposure to diverse situations, but it is known that, the role diverse IT features and information systems are quite important in this information age. Private and public organizations need to focus on this component in respect to (regarding the) unstable and competitive conditions within the organization.

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