

The Role of Technology in Achieving to Agility in Electronic Company in Kermanshah

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ABSTRACT

In production management, agility as an appropriate response to the circumstances has been addressed and in some researches has attempted to identify the factors, although some of these factors can be a subset of technology into account, but study of all related factors to technology in research is not done. In this study, the concept of technology has been in three aspects of production technology, product technology, and information technology, and the impact of each component of these dimensions on agility in electronic industry of Kermanshah reviewed and discussed about their relationship with agility. Further more different component based on the two factors of importance and their distance has been ranked from their ideal situation that shown their priorities to them in the way of agility. in this grade “high-tech production” is located in the first place.

KEY WORD: production technology, product technology, information technology, agility

1. INTRODUCTION

Looking to 21st century can be realized that ensure the survival and success is being harder and harder. This fact has a root in appearance of new era that use changes as the main characteristic.

During 1980s in a response to the preference of different customers, companies were drawn to the quality management.

Some concepts were applied such as total quality management, stabilized process control, development of the proposed qualitative characteristics.

At the same time some kind of systems such as flexible manufacturing, pure manufacturing and production in the global class system were produced. (Lindbergh 1990) in 1990s, however, many companies were still struggling to implementation the concepts of lean manufacturing, industry leaders tried to formulate a new paradigm for successful manufacturing institutes in 10th century that took the name agility (R, Dove and R, Nagel, 1991) and in the short time raised as the most important aspirations of leading companies. Agility, enable the institution for success in a rich environment from the continues and unpredictable changes and severe changes, want a higher agility. For this reason, some researchers have called the fashion industry’s neediest agility industry (Pearson, M., 2008). Agility from vision of Goldman, et al is to provide value to our customers, preparing for changes, valuing the knowledge and skills of staff and forming virtual organizations (Goldman, SL, Nagel, RN and Preiss, K., 1995)

Researchers have attempted to provide pathways for achieving agility and have worked to identify some of the dimension of agility and factors of agile organizations. However, thanks to the universal image of this research, it is useful that macro programming in countries, recognize the proper factors with the current situation and strive the conditions of their native and crosscut pathway of their industries agile based on existing facts. Among this, one of the most important parameters in the role of technology has been noted in the inevitable electronics companies to achieve agility, technology. (Kidd 1994) knows the agility base as an organization, people and technology. Gunasekaran, (1998) notes that agile manufacturing needs system development that design, manufacture and assemble figuratively, some of the researchers also note technological capabilities as the main factor of agility in the same expression. (Sharifi and Zhang 2000) Kisperska-Moron and Swierczek (2009) emphasize on IT as an influencing factor on success in agility. Considering the importance of this factor, this question is raised that how dimension of technology affect the agility. How is the preference of technology factor in the industry of agility? In this study is tried to answer the above question with collecting data in two theme i.e. agility and technology in

* **Corresponding Author:** Mohammad Javad Boroomandfar, Department of Management and Economics, Kermanshah Science and Research Branch, Islamic Azad University, Kermanshah, Iran. J_boroomandfar@yahoo.com

electronic industry of Iran. The concept of agility has been caused to show various and wide explanation in recent years. Bottani (2010)

The excessive variety of provided definition for agility in this article, impede the investigation for all of them, thus, maybe Agility can be defined as the following:

“Agile organization is an IT organization which can create internal and external coherence and despite of the drastic changes in the market can provide the satisfaction of customer by offering customized products”. Researchers have used the various scale and component in order to measure the rate of agility in organization. The features of agility, enablers of agility and some enablers that allows the companies to immediately response to changes, are discussed widely in the theoretical foundations. Bottani (2010).

2-2 Technology

Today one of the most important challenges of countries, reaching more competitive at international level. The continues change of technology (the process of the process of creative destruction) commonly has seen as a background and the need for competitiveness and survival in a competitive world. In the late 1950s, Robert Solow stated that 1% of improving exploitation by technological changes and only 1% is justified by economic growth.

Production Technology

Production technology is defined as an equipment and processes used to manufacture the products. Importance of exclusive technology of either patent or copyright or otherwise should not be underestimated. Scale production technologies have been developed in the form below:

Ready for new technologies, technology assessment, forecasting of new technologies, the use of technology on production,

Monitoring equipment, working with suppliers in terms of technology and technology strategy. Heim and Pang (2010)

IT: information technology is used to break down communication barriers between corporate functions, in order to enable

Line workers and the ability to run the process reengineering. Attaran (2004).

Using the IT as one of the basic steps Leading organizations, had been an important part of IT research during two decades , and is predicted that companies which use IT, gain competitive advantage. Steven, Michael (2007)

3-3RESEARCH METHODOLOGY

The methodology of this paper is to answer questions, survey and collecting data and questionnaire and interview of the study. The purpose of this study was to define the indicators and measures to assess the implementation of agile concepts and technologies in the manufacturing companies. In this regard, the scale used by various researchers is collected and the proper classification of them with regard to their definition is provided. These scales in form of questionnaire are examined by using the opinion of 11 PHD students and professors of management comments and Industry

In addition, any needed corrections have been applied to validate on it.

Considering the importance of a full explanation of the research community, a list of companies producing electronic products has been provided by using the information of industry, mine and trade organization of Kermanshah and has been updated by using different resources such as Published reports and professionals Database and related institutions and questionnaire was sent for them. After validation of the content in the initial stages of research, in this phase by returning data, test of construct validity (convergent validity, divergent validity and reliability of the one-dimensional) and the reliability on the data were performed in order to provide the background for assured use of them for testing hypotheses. In this stage, the validity was determined based on factor analysis exploratory and confirmatory and reliability based on internal consistency, Cronbach's alpha coefficient. Then the valid and permanent data made assess of the research hypothesis possible by taking part in the regression test of agility based on the independent variable of technology and finally they formed the standardized regression weights with the gap in status of independent variables and grade of technology component by using the Topses technique.

4-4 Data Analysis

Different methods of data collection make the data of 10 electronic companies available that the number of personnel in these companies was 11 that according to Morgan's table 10 people were selected. With calculating the

agility index and technology by using the related variable, average and standard deviation were obtained from the table (1):

Table 1:Structural indices

structure	average	Standard deviation
agility	3/55	0/74
technology	3/43	0/81

Validity of research

The content validity was confirmed before the distribution of questionnaire. In order to do this work 8 members of the faculty in industrial Engineering and Management courses and also 15 manager or Engineers in the electronics industry with the bachelor degree were used in analyze the exploratory for agility and technology factors, with improvements in technology, having removed 5 variable of technology (trying to product, readiness to accept the new technology, Electronic systems for product tracking, Planning processes and the cost of hardware and software) and two variable of agility (using the opportunities in public and before and after-sales services) however it happened after reviewing the data

Table 2: The result of Exploratory and confirmatory factor

Structure	KMO	Bartlett significant	Variance agent	RMSEA	X ²	X ² /df	p-value	GFI	IFI
agility	0/64	0/000	0/70	0/0006	181/15	1/1	0/47	0/9	0/92
Technology	0/75	0/000	0/65	0/025	79/25	1/46	0/43	0/94	0/91

Stable factor of research

Internal Cronbach's alpha coefficient from collected data of electronic industry has been used, in order to evaluate the stable factor of research. Permanent of agility factors and technology which were obtained respectively 0.77 and 0.78 that shows the suitable stable for factors of research.

Analyses of regression

In the first stage of the study the normal status for distribution of main variable is checked out. Results showed that the theory of Normality of all structures and their dimensions are not rejected. In the first phase the Pearson correlation test was performed by using this approach in order to have connection between two agility and technology factor. The rate of correlation and significant levels shows the connection between agility variable that technology factor and all of its aspect have significant connection with agility and this result seems logical with regard to effect of technology to improve the speed. But the important thing is how to justify the changes of agility by these variables at a time when all of them are analyzed together. In order to this aim, linear regression analysis was used with dependent variable and independent variable of agility in technology dimension. And is generally recommended before performing the regression analysis, the relative linear relationship between the dependent variable and independent variables should be examined. This work was done by using the scatter plot. A linear and positive relationship with agility was observable In the case of both the technology and product

Production. However the relationship between the independent variable, i.e.

IT seemed slightly flawed but undeniably it is not linear. For this reason, in order to

Closer examination of these variables was also analyzed in relation to the review of the statistical tests. With this introduction, multiple regression models were calculated by using the stepwise method. As can be seen, all three independent variables of technology are approved as the effective variable on agility of organization. The amount of explanation for variable variance of agility by the variables IT in the final model (third model) was obtained more than 81% that shows the regression model has a very good explanation. It should be noted that the coefficient of determination on arrival variable of technology has No significant change and this can be a reason for changing the role of this variable than other variables. Analysis of variance to test the validity of a regression model showed the validity of the proposed model. At the end, the final model of multiple regressions is written according to table 5 by using non-standard and standard of regression coefficient (Beta coefficient). However, using this equation and regression model is because of the assumption that the multiple linear regression model were created based on them. These assumptions usually are reviewed after presenting the model because it is necessary to examine the residuals examined. The following assumptions are examined.

Table 3) correlation between agility and technology:

		technology	Product technology	Manufacture technology	Information technology
	Pierson correlation	0/93	0/65	0/75	0/55
agility	Significant level	0/000	0/000	0/000	0/01
	number	51	51	51	51

Table 4: the coefficient of correlation and regression

Model	Correlation coefficient R	Coefficient of determination adjusted	Change in determination coefficient	Significant level	Standard error estimate	Camera Watson
3	0/975	0/950	0/948	0/005	0/034	2/17

Table 5: regression coefficient

Final model			Non standard coefficient	Standard coefficient	t	Significant level
	Constant quantity	1/74	0/071		24/75	0/000
	Manufacture technology	0/33	0/015	0/73	21/47	0/000
3	Product technology	0/22	0/014	0/52	15/29	0/000
	Information technology	-0/035	0/016	-0/07	-2/18	0/03

5-5 DISCUSSION AND CONCLUSION

In 1996 Science and Technology Council of America in its report entitled with “Technology in the national interest” stated that Technological advances are the most important determinant of sustainable economic growth in the country. More than half of America’s long term economic growth in 11 years and is introduced due to the resulting technology. Meanwhile Khalil notes that the technology doesn’t create wealth perhaps using the technology in the effective and appropriate method makes wealth. (Tanka et.al.2007)

Porter also noted a similar expression that technology has not value by it self. This thing that the company is an industry leader in technology or is a technological competitor in technology industry Alone and by itself will not improve profitability. (Swafford, Ghosh, and Murthy, 2006)

So check how technology natively interact with industry performance standards, it can track the performance excellence Clarify and explain the technology platform. The purpose of this study, by using collected data from active companies in the failed of electronic industry of a country, taking account of organizational agility was examined by using the technology aspects. The results are approved the connection of all aspects of technology with agility. The connection between these dimension and agility had already been approved by different researchers.

Najel and Dove point out that required corporation for manufacturing the agility is possible only by using advanced technology. Hoper knows one of the elements for agile manufacturing is a leading. Some of the researchers have gone beyond a simple relationship and have introduced agility as the combination of different technologies. However, the important point is that, while two aspect of manufacturing technology and product technology explain the most part of the agility variance, but the communicate between IT and agility in this analysis were obtained negative.

The first hypothesis is that the influence of the size of the company (Number of employees) at the relationship between two variables of IT, the second hypothesis was based on the indirect connection of these two variables through the manufacturing technology and product. Companies are divided into the large group based on the number of their employees In order to test the first hypothesis. Reanalysis showed that in any of the following categories of information technology has no significant relationship with organizational agility.

Schroeder and Flynn pointed out those three dimensions of technology should be together and interact with each other, otherwise they like a gears that move separately and they are not turned each other. For example, computer integrated manufacturing as part of the produce system, without any information could not work well.

Product design and product of technology strongly influenced the production phase of the product in the production stage and determine the required product technology and design with computer aided tool to accelerate new product development process and provide design is better. Finally, Ranking variable affecting the agility of IT is proceed in order to provide the agility course in the context of technology. Advanced technologies that are available to developing countries for industrialization

Developing countries are essential. Many countries that are developing, have received benefits from the advanced technology imported. For example, some European countries and the United States of America imported many technologies from Britain, while Japan and Korea achieved their required technologies from Western countries.

(Schroeder, Roger and Flynn, Barbara, 2001).

Thus, in this context can be proceeding by using the appropriate method of transfer technology, to equip the electronics industry in the modern technology. The next step is to consider the quality of the design phase as a variable within product Technology that can remove the costs and rework existing in the industry of country. The related variable with IT as well as expected have set at the end of the priorities. This is not because of the low significance of these variables, but according to what the results revealed to experts, lack of appropriate hardware and software infrastructure, lack of appropriate legislation in this area and the lack of appropriate training, are the main factors of stopping the effectiveness of the significant and determinant technology in the country, that confirmation of these cases is suggested as a context for the future research.

It seems that removal of these problems by providing the infrastructure, train this technology from an early age and the use of technology-based public services Information can be overcome.

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