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Investigating the Effect of Forecasting on Organizational Agility in Fanavaran Petrochemical Company

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Abstract:

Today, the importance of knowledge management has been acknowledged as an important weapon for maintaining competitive advantage and improving performance and achieving organizational agility. Therefore, this research seeks to determine the forecasting value of organizational agility toward changes.

According to the results of this research, the effect of prediction on organizational agility is 0.69 and its significance is 3.03 in Fanavaran Petrochemical Company. Based on this finding, as it is more than 1.96, the company's structure has a high ability to adapt and adapt to environmental changes. In services and products, and company managers use existing knowledge in organizational decision making.

Key words: Forecasting, Organizational agility, Knowledge management, Petro chemical company

Introduction

The new era of business in 21st century has recognized change as one of the main features (Hung & et al, 2012). Experts believe the cause of business changes are the increasing availability of technology, the strong competition in technology development, globalization of markets, business competitiveness and the rapid growth of technology access. Hence, in such an environment, organizations can not be traced and controlled traditionally and like past methods. Effective and useful response to these changes and the acquisition of competitive advantage from opportunities they generate is an asset to organizational agility (Shahaei, 2006).

Organizational agility is the foundation of the company's performance and competitive advantage (Worley & Lavar, 2010). Companies are often faced with competitive pressures to improve their competitive ability. If organizations develop their capabilities, they will be able to overcome the changing and vague business environment. (Al Maahamid et al, 2010).

Given the rapid changes in the market and the risk of losing markets for selling products in a bid to survive and succeed in a competitive environment, the technology is critical to predicting and responding to market threats and opportunities. The primary conditions are to assess the capability of achieving missions, policies and objectives, predicting or in fact identifying the results and evaluating the performance of the activities. Prediction helps us to consider uncertainties and uncertainties in a list and to design strategies with their help (Pouli, 2015).

Predicting is a systematic effort to examine the long- term future of science, technology, economics, the environment and society in order to identify emerging technologies as well as the strategic areas of strategic research that have the most economic benefits. Predicting leads to the importance of policymaking, reducing the resilience of the policy process, enhancing commitment to achieve results and creating synergies to increase the effectiveness of policies. (Technology Management Department of industrial Management Organizational quoted Pisil, 2003).

On the other hand, the implementation of knowledge management processes is considered as a very valuable step for organization the organization. As Rick Dow (1999) acknowledged «organizational agility comes when knowledge management and accountability can be balanced in organizational efforts» (Qanbari & et al, 2014). For knowledge to become the basis for sustainable competitive advantage, current knowledge whit in the company should be easily distributed among employees, but in such a way that it is impossible to copy it to other organizations (loubit, 2001). Literature suggests that any organization must create a new knowledge in order to compete, and share it across organizational entities, and quickly apply new technologies and products (Schlegelmilch & Penz, 2002).

Therefore, many current researchers agree that «knowledge management isn't just the storage and use of information, but it is process that requires commitment to the creation and dissemination of knowledge through the organization. According Gupta et al (2000) stated that knowledge management is a process that helps an organization discover, select, organize, disseminate and transfer knowledge for activities such as problem solving, continuous learning, strategic planning, and decision making» (Lawson, 2003).

Therefore the main competitive advantage for organizations is their ability to manage knowledge. Today, many companies and organizations in the world have invested in knowledge management, which Fanavaran petro chemical is one of these companies. Despite the success of many, many organizations have failed. It seems that a series of situations, conditions and challenges will lead to the successful or final failure of knowledge management activities in the organization. Therefore, before the organizations scare resources are invested in such a high-risk area, management should seek a tool to reduce the uncertainty of knowledge management project. Therefore, the petro chemical industry in the south of the country Iran has made significant progress and it has been able to become one of the largest industrial poles in Iran.

Considering that there were many economic and managerial problems in the Fanavaran Petro-chemical Company, which occasionally led to the decline of company. Much of this decline has been due to the lack of recognition of market day needs in response to market needs, so the use of knowledge management tools, tools for predictive and organizational agility in this company can increase the organizational effectiveness of technology of petro-chemicals. Therefore this research studies the impact of agility on the agility of Fanavaran Petro-chemical Company, and examines the relationship between these volunteering in developing the agility capabilities of the organization. In this way, it is possible to plan the necessary measures for development of agility and competitive performance.

The research hypothesis: Forecasting has a positive and significant impact on organizational agility in Fanavaran Petro-chemical Company

Conceptual model of research: According to the research literature the following conceptual model has been considered for assessing the impact of Prediction (based on the Amir Nejad model, 2014) on organizational agility (based on sharifi and Janek's model, 2000).

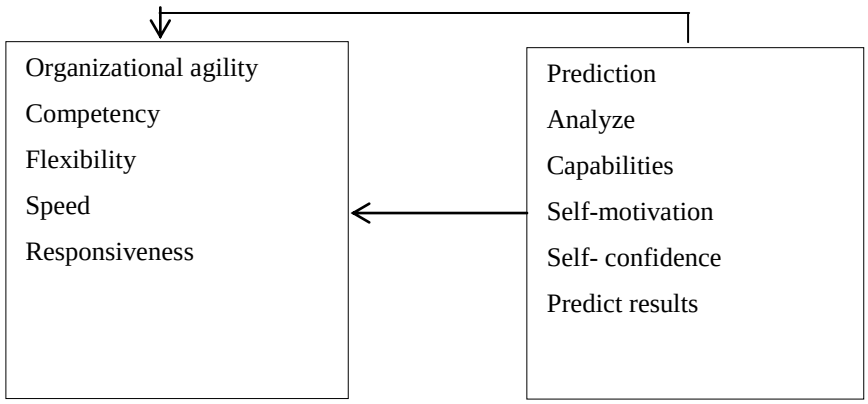

Figure1: Conceptual model of research (Amir Nejad, 2014, Conrad and Newman 2000, Sharifi and Zhang, 2000).

According to the main research model, we seek to achieve the main hypothesis of the research (Forecasting has a positive and significant impact on organizational agility in Fanavaran Petrochemical Company) in order to improve the flexibility and speed in the Petrochemical Company of Fanavaran.

Theoretical framework of research:

Organizational Agility

The term agility for the first time in 1991 was officially introduced by the Iacocca Institute at Lehigh university, following a meeting of many industry experts in science and technology, and it was in order to find out the causes of companies helplessness in confronting challenges and environmental changes, in a report titled "The 21st century Manufacturing strategy, The Industrialists view point" (Iacocca Institute, 1991). Organizational agility requires the company to become more agile in providing it technology, its employees and its management with the communication

infrastructure in responding to changing customer demands in a changing and uncertain business environment. Simply, agility is the agility of the company to generate the information it needs to decide managers in the turbulent business environment (Zain et al, 2005). In kettunen's theory, after numerous studies and use of various agility models, kettunen (2009) compares agile manufacturing concept and agile software development models. He described concepts of agile organization as follows:

Managing core competencies of the organization, virtual companies, re-configuring capabilities, knowledge-based company, process of making strategy, Business process integration, responsiveness (change in demand), active, strength, fast time cycle, flexible product, massive ordering, speed, supply chain management operation flexible production, simultaneous engineering, rely on GIT1 production, process improvement, people work force, leadership, decision making, quality of working life (Kettunen, 2009).

Agility General Model

Preiss and Colleagues (1996) mentioned partnership as the main means of survival and progress in the modern era of business. They provided a general model for agility. This model is considered as a general approach to help managers and includes processes that guide the company in identify the business environment and its changes. In this model, features, power infrastructure and ultimately business processes that should be identified in future organization activities to maintain competitive advantage are presented. Therefore, the organization must first hare a proper understanding of market forces and the changes that take place inside and outside the environment. Then, you must identify the status and level of it, and in the third stage due to this familiarity the infrastructure must be provided to achieve agility and finally, take the necessary action (Sharifi & Zhang, 1999).

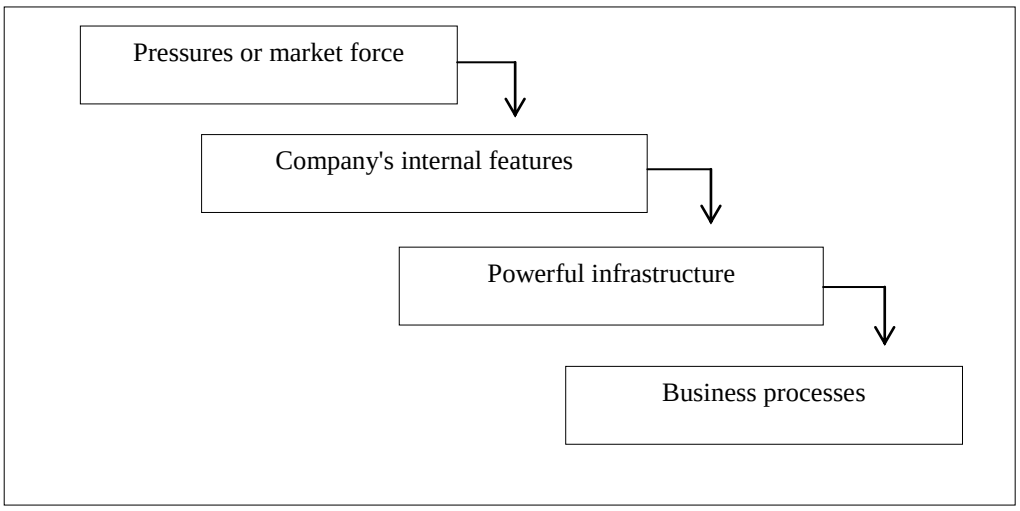

Figure2: generic agility model (Priess et al, 1996)

Prediction

Prediction is neither horoscopes nor gossip! In the word of Edward Curtis- founder and leader of the future society, the most important goal is to anticipate what will happen in the future with the continuation of existing trends, and in this way, decide if such a future is desirable to us, and if not, try to change it. Prediction is not exactly the anticipation the future. In anticipation, in addition to short-term horizons (for example, 5 years old), it is expected that the maximum accuracy will be predicted, however in predicting it is not so important to anticipate future details and to set priorities for a more informed choice and smarter decision making. When future is shaped by decisions of relevant decision makers, knowing the motivations and reasons for doing so is necessary. Many decisions are heavily influenced by external factors and how decision makers respond to these external factors depends on their perception of the future. Therefore, predictive activities may stimulate real development through joint expectation.

Van Der Metulen in his article notes that "the use of predictive process depends on how it affects the strategic uncertainty of organizations and their strategic position in the innovate system". To understand these relationships, he compared various national activities in Germany, England and the Netherlands. According to studies, he believes that if uncertainty is high, much interest in predicting and obtaining result can be expected, and if the agent involved in the forecasting process are heavily dependent on the resource of other organizations (such as information, knowledge, capital, supplier and …) the forecasting process will be effective. Overshooting the institutional framework of forecasting in order to analyze actual processes may outweigh the knowledge of the internal relationship between decision makers and technological, global and economic developments. In fact, the commitment of contributors is to predict the technology that has the most relevance to success. In his article, Salo analyzes the contribution that contributing factors play in predicting. He emphasizes on the timing of early stimuli in the design phase in any prediction. The famous five-CS Martin is considered as a benchmark of success. In fact, if a predictive process works well, the following should be realized:

- Focus on longer courses
- Increased coordination between attitudes, goal and stakeholders
- Agree on areas that appear to be effective.
- Communicate with social needs, scientific and technological opportunities.
- Commitment to the implementation of policies that are guarantee in practice.

To fulfill the goal of the five CS, a commitment to all contributors is essential in predicting. To this end, certain incentives must be created in the process of anticipation. Salo sees in his article the motives that stakeholders may wish to engage in such volunteering first to attempt to influence (on priorities) the second to participate in the learning process, Third the development of treaties and networking, fourth consensus with high-level executives who encourage prediction, and the fifth get rewards these incentives have different meanings for different stakeholders so

far, most of the predictions have been discussed at national level. But there is an increasing tread in prediction at the level and event at the firm level.

Johnston considers the main problem to be more closely linked to the processes of prediction and to use its results in strategies and actions by analyzing the strengths and weakness of past decade predictions. Other problems are the lack of framework for helping decisions in the way in which space is possible. He concludes that the past is not the future of the future, and what is needed along with the use of the special tools such as prediction, is the transformation and adaptability of structure and culture. In order to understand these essential changes, special attention should be paid to all the main stakeholders during the foresight activities. According to Johnston, in many of the recent forecasting process, there has not been enough interactions between stakeholders and decision-makers, and this has led to a lack of application of predictive outcomes in decisions. Given the methodological shortcomings, he has provided a framework for drawing up different methods of the prediction. The measure of future projection at various levels is uncertainty, which has a range of "future as a reflection of the past" to "complete ambiguity".

Therefore, the very important task of predetermining institutions is to determine the level of uncertainty of specific tasks and to fit them into appropriate methods for discussing the cultural dimensions of prediction. Johnston uses two prominent methods of scenario analysis and Delphi method. The Delphi method has places where mathematical accuracy and numbers are required. In contrast, scenario analysis is a qualitative method and requires a more individualistic approach. This method is more relevant in verbal cultures. The same difference in methodology may be the reason for using the enterprise- level scenario analysis method and the Delphi method at the national and public levels for futures (technology management department of industrial management organization, quoted by Pesil, 2003).

In the Persian word selection does not exist a word for prospect theory which it has its comprehensive sense, for this reason, words such as: the theory of perspective and the theory of predictive have been used so far by translators. This theory was proposed by Daniel Canman and Amos Torsky in 1979 as a realistic alternative, considering psychological issues, rather than the theory of expected utility. The theory says how people act in a situation where they choose between risky options such as financial decisions about buying or selling a stock.

In this research, the relationship between predictive and organization agility elements in Fanavaran Petrochemical Company has been studied and evaluated. Organizational problems are so complex and interconnected that detection of the problem is not easy, and also the human nature of the organization and the complexity of employee behavior has doubled this complexity. In such a case, organizations should not wait for the wave, but must they themselves must be the source of wares and work to improve themselves so that they can respond to new challenges and needs. Therefore, the choice of where to go can't be based on historical or fashionable history (Hamid Zade & Fathi Vajargah, 2009).

In the study of the evolution of in intellectual thought with the approach of futures studies from the past, three elements or components have been of particular importance. These three elements are: changes, the speed of change, and the complexity (Taghi Pourgaran, Reza Pour Darvish, 2016). Investigation carried out in connection with the current research, both inside and outside the country, were developed by yektakhah and Abbasian Freidooni (2015).

Their research titled "An Analysis of the Future of the Performance of Companies Using the New Tools of the Companies Accepted in the Tehran Stock Exchange".This research was a type of applied research that was conducted in the automotive and pharmaceutical industries. In order to analyze the data, MATLAB software has been used. The results showed that using prospective algorithms as a tool for measuring the future performance of companies.

Nayini and colleagues (2015) conducted their research titled "Forecasting the future of science production in Quality Management of Banking Services". In this study, the first attempt was made to identify the orientation of written articles in the quality of services, then, based on this in format and using the AR/MA model predict the future trend. In order to achieve the goal, the new method of text mining was used to analyze the text of articles, which resulted in the identification of the research publication process, which shows in what period of time, it increased or decreased, and then by using the results we can predict the trends of issues and the number of topic of service quality in the future. The most common way of evaluating the scientific and research activities of each country is through the use of scienceometric techniques based on inventors, volume of scientific production, citations and scientific publications. Given that the information in this study varies over time, the data genus was a type of time series.

The main goal of the research is to provide an over view of the process governing the quality of service literature, so that it can be taken to plan for the future. After performing the text-mining process on the papers, nine major clusters were identified, with the reviews being the most focused on the areas of warranties, reliability, accountability and empathy. Sherehiy et al (2007) titled their research as "Organizational Agility Review; Concepts, frameworks, and Features".

In this research, information on the agility and agility of the agile workforce was studied to develop the concept of agility. The researchers first noted that they were examined with frameworks that describe other dimensions other than productions and include features that apply to the whole structure of the company; and while numerous articles have been identified on agility production, however, little empirical research has been conducted on agile labor and agile organizations. So this study address the global agility features that can be found in all companies. These dimensions include: flexibility, responsiveness, speed, change culture, integration and low complexity, high quality, custom products, and mobilize core competencies (Sherehiy et al, 2007).Yusuf & Sarhadi & Gunasekaran (1999) developed their conceptual

Research titled "Agility Production: Stimuli, Concepts, and Features". In this study, they outlined the method of achieving organizational agility in an operational model. Based on this model, each organization need to recognize and develop its core competencies in order to achieve agility. Then barriers and bottlenecks are identified to answer the changes, in other words, those factors that prevent the organization from achieving desired performance, and based on agility features, mechanisms are being developed to deal with them. These mechanisms must, in addition to eliminating the barriers and bottlenecks of the organization, improve its performance and enhance the competitive position of the organization (Yusuf et al 1999).

Research Methodology

The present study have been done due to predictive variables and organization agility, structural equations and factors analysis, based on the purpose is applied, and according to the method of data collection is descriptive causal. The statistical population of the study consist of 730 employees of Fanavaran Petrochemical Company, which 256 people were selected by using the kerjesi and Morgan tables and simple random sampling method. The questionnaires were distribute and two questionnaires were used to collect the data. One is Amir Nejad's (2012) predictive questionnaire, which includes 8 items and 4 dimensions of analysis, self-motivation, self-confidence and prediction of result. Another is organizational agility of Sharifi and Zhang (2000) which consists of 16 questions and measures 4 dimensions of responsiveness, competence, speed and flexibility. In this research, data analysis was done on descriptive and inferential statistics using SPSS and LISREL software. In this study, the reliability of organizational agility (1) questionnaire and predictor (2) questionnaire was calculated using Cronbach's alpha.

Reliability	Dimensions
0/80	Responsiveness
0/86	Competence
0/81	Flexibility
0/79	Speed

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Conceptual and operational definition of research variables

Prediction

Conceptual definition: it's the consideration of a desirable future to be created, not a future that is likely to occur. In this way a person looks at to a desirable future and then tries to determine the scale needed to achieve such a future (Moradipour & Norouziyan 2005).

Four components: total capacity analysis, self-motivation, self-confidence, and prediction of result.

Operational definition: Analysis of total capacity is evaluated through two areas: An analysis of bottleneck, situations, opportunities and environmental demands, the availability of facilities, equipment and knowledge necessary for the analysis of activities.

Organizational Agility

Conceptual definition: Success agility is in an ever changing and unpredictable environment, as Goldman and colleagues put it as a unique, fundamental and new way of business management (Kiyaei, 2010).Operational definition: In this research, organizational agility is measured through 4 dimensions of competence, accountability, flexibility and speed.

Responsiveness

Conceptual definition: it's the ability of detection of changes and responding quickly and benefit from them (Jafari Nejad & shahaei, p.46).

Operational definition: in this research the response component was measured through three indicators, exploitation of opportunities, sensation, perception and prediction and prediction of change, rapid response as soon as impact on the system was received.

Competency

Conceptual definitions: the ability to effectively and efficiency implement organizational goals. Examples of these abilities are the ability to be technological adequate and affordable (Theasing & Lin, 2011).

Operational definition: In this research, the competency component has been measured through 7 indicators, the ability and technical skills, the quality of products and services, the performance of activities in order to improve the efficiency, effectiveness and effectiveness of the operation, the use of appropriate technology (software and hardware), internal and external cooperation and integrity and coherence.

Flexibility

Conceptual definition: flexibility is the ability to execute various processes and achieve different goals with similar features (Theasing & Lin, 2011).

Operational definition: in this research, flexibility is measured through four indicators, the ability to increase product capacity, product flexibility, employee flexibility and flexibility of the structure.

Speed

Conceptual definition: it is the ability to perform operations in the shortest possible time (Jafari Nejad & Ahmadi, 2011, P.60).

Operational definition: in this study, the speed variable was measured through 3 indicators: the timely and prompt delivery of goods and services to customers, the rapid delivery of new customer services, and the speed of performance.

Research findings

1. descriptive findings

In this study, 243 people were equal to 94.9% of male respondents, and 13 were female which is equal to 5.1%. Most of the participants also hare Bachelor degree. Most people have 4 to 6 years work experience. The history of the least-abundantly belongs to the group of less than 2 years. (Shahaei, 2007, P.46).

Variable	Skewness	Kurtosis	The standard deviation	Average	Frequency
Responsiveness	0.793	0.730	0/42512	4.0062	256
Competency	0.793	0.547	0.72874	3.5267	256
flexibility	0.666	0.851	0.45633	4.6590	256
Speed	0.854	0.754	0.66972	4.6990	256
Analyze	0.636	0.811	0.44258	4.0337	256
Self-motivation	0.605	0.204	0.42326	3.2254	256
Self-confidence	0.122	0.210	0.33352	3.3569	256
Predict result	0.686	0.676	0.56972	4.5633	256

Table1. Descriptive statistics for research variables

2. Inferential finding

To use statistical techniques, it must first be determined whether the data collected is of a normal distribution. Because if the distribution of the collected data is normal for testing the hypothesis, then a parametric test can be used, and nonparametric tests are used if abnormal.

hypotheses	Statistic Z	Sig	Confirm hypothesis	Conclusion
Responsiveness	1.215	0.110	H.	Normal
Competency	0.8512	0.192	H.	Normal
Flexibility	0.955	0.125	H.	Normal
Speed	0.555	0.066	H.	Normal
Analyze	0.954	0.093	H.	Normal
Self-motivation	1.410	0556	H.	Normal
Self-confidence	1.266	0.852	H.	Normal
Predict result	0.725	0.163	H.	Normal

Table2. Confirmatory Factor Analysis of Research Variables

The results of the estimation indicate the relative suitability of the indices. According to the LISREL output, the calculated value of X2 is 911.31 which is less than the number 3 relative to the degree of freedom. The limit of RMSEA Is 0.08. The AGFI, GFI, NFI indices are equal to 0.92, 0.94 and 0.95 respectively. The results are presented at the below table.

NNFI	AGFI	GFI	RMSEA	P-VALVE	PD	CHI-SQUARE
0.95	0.94	0.92	0.08	0.0000	402	911.31

Table3. Model Indicator table

In order to show the consistency of or validity of the model, the measure of the AVE index was used, with values above 0.5 acceptable and indicating the internal validity of the model of measurement.

Variable	AVE
Responsiveness	0.62
Competency	0.557
Flexibility	0.663
Speed	0.663
Analyze	0.772
Self-motivation	0.633
Self-confidence	0.742
Predict result	0.593

Table4. Internal Model Validity (AVE index)

According to the results of table 4, all values obtained for the AVE index are larger then 0.05, which indicates the validity of the intangible values of the model.

Sample adequacy		0.895
1757,179	Bartlett's	2717,741
Significance level		0.000

Table5. The result of KMO and Bartlett's test

The size of the sampling capability the KMO test is the amount of variance in the data that is acceptable if it is above 0.6 and closer to 1. As you can see, this value is equal to 0.895. So you can do a factor analysis for this.

Structural Equation Model for testing research hypotheses.

Finding from research hypotheses

Hypotheses1: Prediction has a positive and significant impact on organizational agility in Fanavaran petro chemical company.

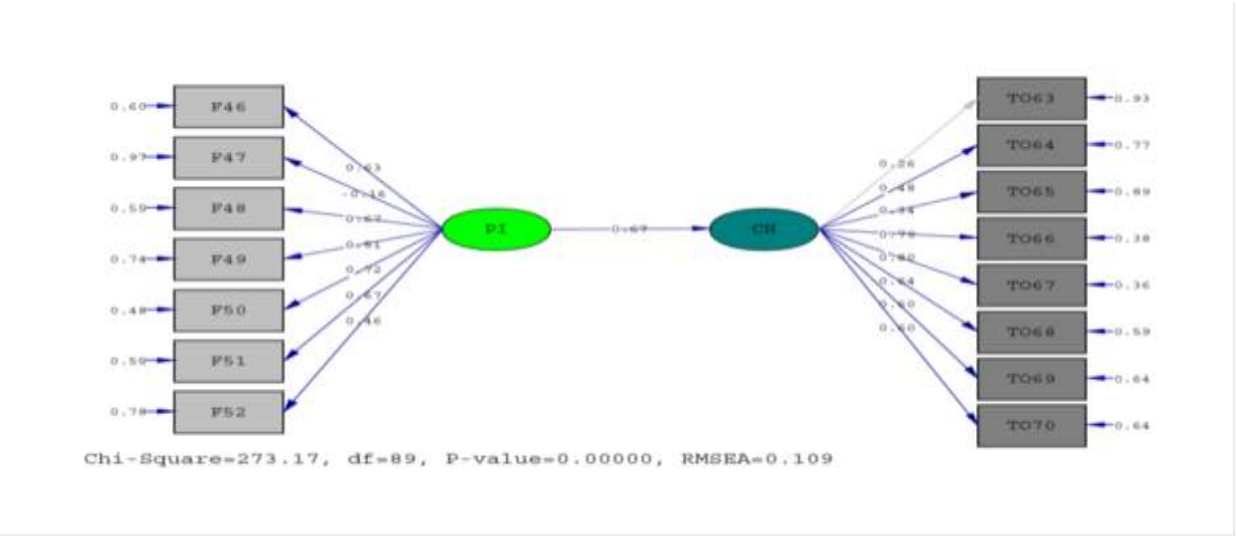

Figure1: Research model in standard estimation mode

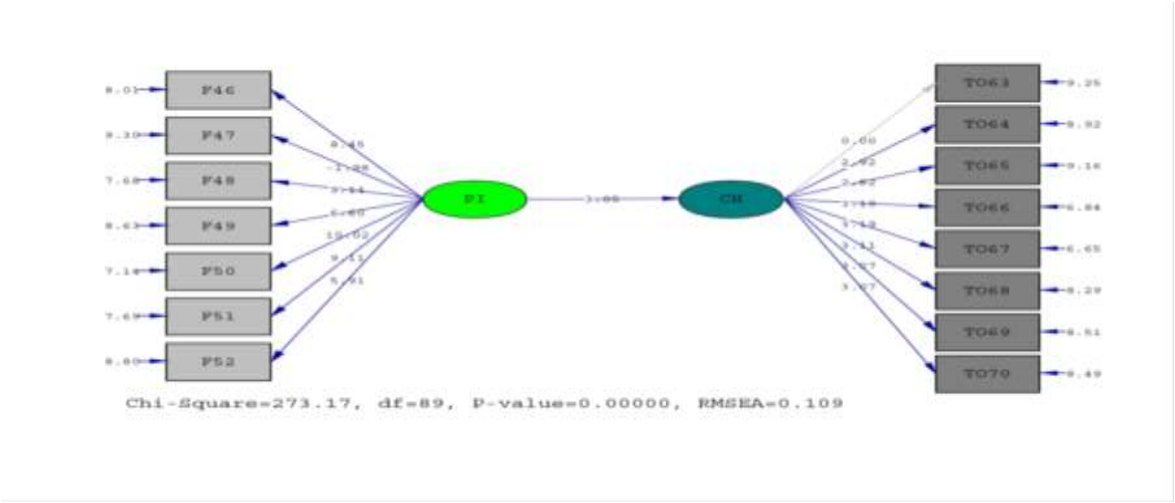

Figure2: Research model in meaningful numbers

According to the structural equation obtained in figures 1 and 2 and at 0.05 significant level, null hypotheses is rejected. As a result, the investigator's claim is confidently approved, and the error rate is 5%. It can be said that there is a positive and significant impact on organizational agility in Fanavaran petrochemical company.

The magnitude of the impact anticipation on organizational agility in Fanavaran petrochemical company is 0.69 and its significance is 3.03 it is more than 1.96.

Discussion and conclusion:

Organizations need to be able to overcome unexpected challenges in order to cope with unprecedented environmental threats and to benefit from and benefit from it as a growth factor. Therefore, agility is the ability to identify opportunities for competitive activities and start appropriate activities. The result of the estimation indicate the relative suitability of the indices. According to the LISREL output, the calculated value of X2 is equal to 911.31 which is less than the number 3 relative to the degree of freedom. The value of RMSEA is also 0.08. The limit of RMSEA is 0.08. GFI, AGFI and NFI indices are 0.92, 0.94, 0.95 respectively which indicates a very good fit. In order to show the consistency or validity of the model, the AVE index was used, with high values of 0.5 acceptable and indicative of the internal validity of the measurement model. Sample size KMO is the test value of the variance in the data that is better if it is higher than 0.6 and closer to each other. As can be seen, this value is equal to 0.895. Therefore, factor analysis can be done for these items, and reduced the research data to a number of underlying and fundamental factors. Also due to the significance level of the above table, which is less than 0.05, we can say that 95% of the variables in the research are correlated.

In accordance with the structural equation, the null hypothesis is rejected at 0.05 significant level. As a result, the researcher's claim is verified with 95% confidence and with an error rate of 5%, it can be said that: there is a significant and significant impact on organizational agility in Fanavaran petro chemical company.

Based on the result of the research hypothesis, the effect of prediction on organizational agility in Fanavaran petrochemical company is 0.69 and its significance is 3.03. Since this value is greater than 1.96, in the explanation of this hypothesis, it can be stated that the company's structure has a high ability to adapt and adapt to environmental changes. In this company, special attention is paid to creating flexibility in services and products, and managers use existing knowledge in organizational decision making. Hence the procedures and processes of work in the company vary with new knowledge, and employees use their knowledge for the benefit of the company. According to the a bore results, Fanavaran petrochemical company using its agility capabilities, is able to predict the changes and expectations of its customers in the production and supply of its products to domestic customers and export markets, and in this way it can maximize profits. Based on research literature, organizational agility capabilities will be developed in the light of capabilities such as forecasting and knowledge management.

It is therefore suggested that:

- The company's structure has the ability to adapt and adapt to environmental changes.
- The company will pay special attention to creating flexibility in services and product, and managers will use existing knowledge in organizational decision making.
- The procedures and processes of work in the company will change according to the new knowledge, and employees use their knowledge for the benefit of the company.

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