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A survey on the level of Organization Agility and proposition of a Comprehensive model (the case of Nir Pars Company)

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Abstract

Rapid developments in present age on the one hand, and the conditions prevailing national firms and presence in the international arena on the other hand requires considering necessary strategies to compete in the global arena. In order to survive in this competitive era, organizations must think about reducing response times and improving flexibility in performing tasks. Doing so requires the creation of entirely new form of organization. On this basis, moving an enterprise towards agility as a new approach in the path to change is vital.
The purpose of this article is to explore the level of organization agility and propose a comprehensive model for Nir Pars Company. This is an applied, descriptive-correlation research, conducted by survey methodology. A collection of 400 experts and managers of different organizational levels of Nir Company were chosen as the statistical population of the study and a batch of 240 persons were chosen by simple random sampling. Library method was used for data gathering to form the theoretical foundations of the research, and we used our own questionnaire to confirm or refute the research hypotheses; which has the required reliability and validity (Cronbach's alpha coefficient of 0.964). To explore the relationships between the elements of the Model, factor analysis and structural equation modeling techniques were used. According to achieved results, the organization agility exceeds 0.80(for all parameters of the model).

Keywords: Intercommunity, Responsiveness, Focus on the customer, Flexibility, Proactive and Organizational Agility

1. Introduction

Change is one of the major characteristics of organizations and institutions in today's competitive environment. Organizations are facing heightened competition resulting from

technological innovations, changing market environment and change in customer demands. It seems that rather than fearing change, having prior knowledge, imagining it and beyond that, adopting definite occurrence of change may better determine the change direction and even facilitates its realization. The reason is that the best way to predict the future is to create it.

In such circumstances, organizations must adapt to the complex situations to survive. Dealing with these changes is not possible without engaging in complex and uncertain market conditions. In these circumstances, the only way to cope with uncertainty is having knowledge. Knowledge provides the insight for organizations that broadens their decision-making horizon. Organizations must develop more flexible work conditions; and acquiring this knowledge and making organizations flexible is through agility, so organizations would be able to sustain in the face of changing circumstances. [17] Agility on the one hand, by having a strategic look to changes and opportunities resulting from them, and improving capabilities and organizational infrastructure on the other hand, could be a mechanism for long-term success and survival of the organization.

Nowadays organizations are forced to adopt agility strategies for survival in business, because the primary goal of any enterprise is profitability, success and organizational survival. Agility is a competitive advantage for organizations, enabling them to understand the environmental changes quickly. Agile organizations think beyond adapting changes and seek the potential opportunities to achieve progress, success and survival.

About the concept of agility, we can say that it is a response to changes in the changing and uncertain business environment and includes a new way of doing business. It indicates a mindset of production, purchasing, selling, open commercial relations and evaluating the performance of company and individuals. It needs an organization to prepare and update individuals, technology, management, and communication infrastructure very fast in response to changing customer demands in a constantly changing and unpredictable environment. [9]

Agility constantly considers staff and organizational performance, the value of products and services and permanent change in opportunities obtained from attracted customers and requires continuous preparation for facing fundamental and even minor changes. Agile companies are always ready to learn something new, which increases profitability by taking advantage of the new opportunities. [4, 5]

Benefits obtained from improving and increasing organizational agility are numerous, such as improved structure of processes in organization, assessing worthless activities, Increased market share, improved cost control and organizational efficiency due to control and reduction of costs, earning value in return for investment in information technology and establishing required coordination between IT service providers, Faster progress towards the predetermined goals, organization's ability to change processes and improve operations, providing better service, reduced prices, organizational stability, faster response to customer needs, etc.

2- Theoretical Foundations

2-1- Models of Organizational Agility

For designing conceptual model of research, some researches on the organizational agility

were investigated, including: Hong Tseng &Ching-Torng Model (2011) [7], Yaghoubi, Kord & Azadikhah Model (2011) [18], Zhang Model (2011) [20], Raschke (2010) [13], Dyer & Shafer (2003) [3], Madelline & Youssef (2003) [10] and Pulakos et al (2002)[12] . By integrating some of IT acceptance variables mentioned in above researches in accordance with the realities of statistical population under study, the conceptual model was designed.

One of the most important models is the agility model of Yusuf et al (1999). [19] This model mostly emphasizes aspects of agility like difficulties, the role of human resources and organizational structures. Support of top management in organizations is regarded as a key factor, especially in investing for building agile organization. [19]

A new approach to agility is introduced in Jin-Hai model, which has made the Implementation of agile manufacturing possible using integration, strategic process and information technology. Jin-Hai model focuses on organizational agility at two levels of management and technology in organization. [8]

Another research is the conceptual agility model of Sharifi and Zhang (2000). [16] This model considers an agile structure as the outcome of three main elements of agility providers, capabilities and stimulants, the synergy of these elements leads to an organization with high responsibility, appropriate flexibility and acceptable pace in operations. [16] The completed model of enterprise agility is proposed by Zhang in 2011, which has added three more dimensions to four dimensions of the conceptual model of agility by Sharifi and Zhang (2000). These three dimensions involve proactive, customer focus and participation. [20]

As mentioned, each of these models usually looked at agility concept from different perspective in order to introduce the agile structure. This causes that different models have asymmetric structures at various aspects of organizational agility. Typically, models that have dealt more with organizational structures further emphasized horizontal organizational structures, human resource issues and teamwork and started agility from senior management of the organization. In contrast, models that prioritize accountability and adapting to customers, place higher priority to speed of operations and attempt external coordination by virtual structures and have designed a more agile organization at the operational level. [11]

2.2 - Dimensions of "organizational agility" model

- **Accountability:** the ability to identify, quick response and the use of changes. [14, 16, 20]
- **Proactive:** includes activities such as finding effective and better ways to do jobs, suggesting new methods or guidelines for workplace, the ability to predict future problems in business and looking for opportunities for improvement. [20]
- **Competency:** The ability to achieve the organization's goals and objectives [14, 16]
- **Flexibility:** The ability to process different procedures and achieving various goals, using the same facilities [6, 16, 20]
- **Speed:** the ability to perform activities in the shortest possible time [14, 16, 20]
- **Participation:** Participation is a harmonic process through which employees can affect on managerial decisions. It means providing and expanding common ground for criticism in order to find the shared goals and relating suppliers with partners. [20]

- **Focus on customers:** Every organizational is dependent on its customers. In addition, organizations should strive to pass their customers' expectations. Focus on customer and understanding current and future needs leads to flexible and fast responses to market opportunities, and consequently increased dividends and market share for the organization. Customer satisfaction Increases with effective use of resources, and improved customer loyalty leads to the survival of the organization in business.

3 - Conceptual Model and Hypotheses

Hypotheses that can be derived from the conceptual model of information technology acceptance are as follows:

H1: The organization agility in terms of the "Proactive" variable in Nir Pars Company is above average.

H2: The organization agility in terms of the “Responsiveness” variable in Nir Pars Company is above average.

H3: The organization agility in terms of the "Flexibility" variable in Nir Pars Company is above average.

H4: The organization agility in terms of the "Competency" variable in Nir Pars Company is above average.

H5: The organization agility in terms of the "Focus on the customer" variable in Nir Pars Company is above average.

H6: The organization agility in terms of the "Quickness" variable in Nir Pars Company is above average.

H7: The organization agility in terms of the "Intercommunity" variable in Nir Pars Company is above average.

The conceptual model including research hypotheses are shown in Figure 1.

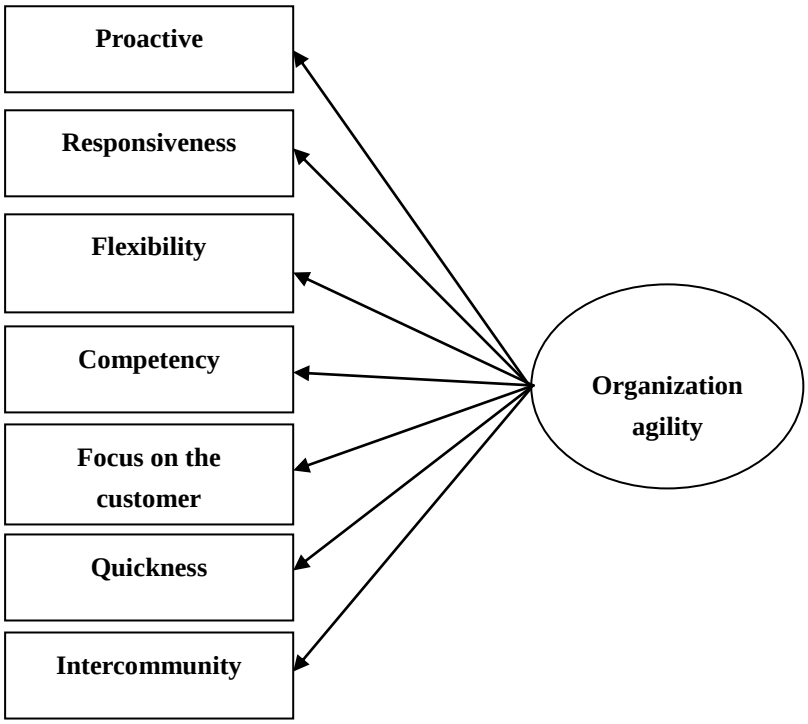

Figure 1: Research proposed model

4 - Research Methodology

The research method of the paper is "applied" in terms of objective, "descriptive - correlation" regarding the tools of collecting information and "Analysis of Variance" regarding the correlation methods. The data collection method is library and field research. First, we performed library studies of literature review and the opinions about "Organization Agility". After the identification of indicators, 240 questionnaires were distributed to a random sample of experts and executives of Nir Pars Company, 230 completed questionnaires were returned. Finally, using Exploratory Factor Analysis (EFA) and Structural Equation Modeling (SEM), the proposed conceptual model of research was analyzed.

4-1- Validity and reliability of questionnaire

Cronbach's alpha was used to assess the reliability of measuring instruments. The result of Cronbach's alpha of the 30 pre-test questionnaires was 0.964. To examine the validity of the questionnaire, "content validity" and "structural validity" were used.

4-1-1- Content validity

Experts' judgment about how the questions of a test represent content and purpose of a program or content scope is used to determine the content validity of a test. For this purpose and to evaluate the research questionnaire, after establishing the basic framework, viewpoints of 9 persons (including 7 managers and experts in NIR Pars and 2 university teachers) were presented and put to the vote. In fact, this evaluation focused on the content validity of proposed indicators to measure the desired aspects in research design. Therefore, in the initial stage content validity has been used for assessing the credibility of the questionnaire and to correct it if necessary.

4-1-2- Structural validity

We use factor analysis to make sure about the structural validity of this study. Exploratory factor analysis and particularly factorial validity index were used to assess structural validity of questionnaire. Factor analysis can be used to determine whether the questionnaire measures the desired indices or not. In factor analysis the questions that were designed to evaluate an attribute or indicator should have common load factor. Since the confirmatory factor analysis is analyzed in terms of a measurement model, and the fitness and validity of the model are discussed in its results, so the results of fitting measurement model are presented in what follows.

4-2- population and statistical sample of research

The statistical population of this research consists of 400 experts and managers at various levels of Nir Pars Company. Simple random sampling method was used. In this method sample size is obtained using Cochran's formula [6].

In this formula, δ is the primary sample standard deviation for the entire questionnaire, ε is the amount of allowable error, Z=0.05 is the unit normal variable corresponding to confidence level of 95%; (Zα/2=1.96) and statistical population N is 400.

$$n = \frac{N \times Z^2\alpha/2 \times \sigma^2}{Z^2\alpha/2 \times \sigma^2 + (N-1) \times \varepsilon^2} \Rightarrow n = \frac{400 \times (1.96)^2 \times (0.62504)^2}{(1.96)^2 \times (0.62504)^2 + (400-1) \times (0.05)^2} \Rightarrow n = 240.292 \sim 240$$

Given that the statistical population of this research is 400, according to Morgan table (1969) the desired sample size is 196. And Given that estimated standard deviation of the pilot sample(n=30) equals 0.62504; and the other hand, due to the size of staff population based on Cochran's formula, sample size is at least 240 questionnaire. In this regard, 240 randomly selected questionnaires among experts and managers at various levels of Nir Pars Mapna Company were distributed. Finally, 233 questionnaires were returned which only 230 of them were completed. Also to fit the sample size in Exploratory Factor Analysis, KMO

indicator was used which is mentioned in the following.

5 - Data Analysis

Inferential statistical techniques, especially exploratory factor analysis and confirmatory factor analysis were used for data analysis. First, a set of 29 items related to "Organization Agility" are factored using factor analysis. These outputs can be used for confirmatory factor analysis. In fact during the exploratory factor analysis, items are classified by the appropriate style. Then this factorization during the confirmatory factor analysis can be approved or rejected in structural equation modeling technique. The first part of the analysis was done by SPSS 19 and the second part by LISREL 8.8. The outputs of exploratory factor analysis and structural equation modeling will be presented.

5-1- Data Analysis Using factor analysis

Factor analysis tries to identify the underlying variables or factors to explain the pattern of correlations between observed variables. Factor analysis can be divided into two types of Exploratory and confirmatory categories. In exploratory factor analysis, the researcher seeks to discover the underlying structure of a relatively large set of variables and researcher's presumption is that any variable may be associated with any factor. To perform a factor analysis the following four major steps are essential: 1 – Forming a matrix of Correlation coefficients from all the variables used in the analysis and estimation of subscription 2- Extracting factors from correlation matrix, 3- Factor rotation in order to maximize the relationship between variables and factors, 4 - Analyzing the results, calculating the score of factors (load of factors) whose value must be greater than 0.3[15].

After a Factor analysis of 29-item questionnaire, based on data collected from 230 questionnaires, the KMO test index is 0.935, which is greater than 0.6 and indicates the adequacy of sample size. Also given that the sig value of Bartlett test is smaller than 5%.

As shown in Table 1 in this case factors 1 to 7 have Eigen values greater than 1 and remained in the analysis. In fact, the table suggests that the questionnaire, together with 6 factors and explained total variance higher than 81.698%, could assess the "Organization Agility" model. This shows the appropriate construct validity of the questions.

Table 1: Total Variance Explained for "Organization Agility"

	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Dimensions of Organization Agility	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
Responsiveness (R)	**6.586**	58.125	58.125	6.856	58.125	58.125	4.725	**16.294**	16.294
Proactive(P)	**3.597**	5.505	63.630	3.597	5.505	63.630	3.722	**12.836**	29.130
Competency (C)	**3.443**	4.977	68.607	3.443	4.977	68.607	3.568	**12.305**	41.435
Focus on the customer(FC)	**2.527**	3.886	72.493	2.527	3.886	72.493	3.430	**11.827**	53.261
Quickness (Q)	**2.269**	3.686	76.179	2.269	3.686	76.179	3.325	**11.465**	64.726
Flexibility (F)	**1.957**	3.300	79.479	1.957	3.300	79.479	3.219	**11.099**	75.825
Intercommunity (I)	**1.644**	2.219	81.698	1.644	2.219	81.698	1.703	**5.873**	**81.698**

Extraction Method: Principal Component Analysis.

According to Table (1), the first factor, i.e. " Responsiveness (R)" explains 16.29%; the second factor, " Proactive (P)" about 12.83%; the third factor, " Competency (C)" about 12.30%; the fourth factor " Focus on the customer(FC)" about 11.83%; the fifth factor "Quickness (Q)" about 11.46%; the sixth factor, "Flexibility (F)" about 11.1% and the Seventh factor, "Intercommunity(I)" about 5.87% variance of "Organization Agility", which actually indicates the importance of factors in formation of the "Organization Agility" structure.

The rotated factor matrix of these fields will be presented which indicates what questions and at what factor load are related to these factors. Table (2)

Table 2: Rotated component matrix [a] for "Organization Agility" Model

variables	component						
	Responsiveness (R)	Proactive (P)	Competency (C)	Focus on the customer (FC)	Quickness (Q)	Flexibility (F)	Intercommunity(I)
P1	.217	.805	.152	.166	.205	.220	.147
P2	.284	.771	.176	.229	.196	.214	.154
P3	.248	.761	.172	.141	.207	.236	.140
P4	.265	.784	.184	.245	.147	.206	.069
R1	.768	.268	.210	.208	.198	.166	.147
R2	.766	.225	.207	.128	.241	.167	.273
R3	.786	.224	.215	.245	.219	.224	-.013
R4	.762	.260	.166	.229	.263	.171	.130
R5	.780	.194	.198	.209	.162	.185	.196
F1	.269	.287	.193	.218	.180	.652	.218
F2	.170	.202	.231	.255	.119	.767	.085
F3	.199	.230	.157	.253	.202	.780	.019
F4	.200	.227	.240	.122	.260	.703	.266
C1	.215	.143	.799	.251	.114	.183	.022
C2	.205	.112	.771	.118	.259	.242	.170
C3	.233	.209	.750	.239	.207	.163	.095
C4	.174	.214	.739	.203	.277	.166	.221
FC1	.319	.163	.172	.700	.198	.245	.231
FC2	.214	.199	.295	.732	.247	.213	.105
FC3	.203	.263	.208	.727	.287	.225	.054
FC4	.223	.210	.234	.723	.211	.224	.133
Q1	.284	.243	.242	.246	.698	.194	.196
Q2	.277	.189	.262	.271	.720	.228	.140
Q3	.277	.238	.271	.219	.712	.197	.125
Q4	.236	.195	.211	.258	.740	.186	.102
I1	.415	.271	.278	.196	.307	.271	.479
I2	.330	.242	.226	.222	.214	.249	.678
I3	.425	.288	.239	.311	.263	.231	.514
I4	.376	.272	.305	.422	.297	.193	.383

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

According to Table 2, we can come to the conclusion that the factors affecting "Organization Agility" are classified in 7 groups which examine "Organization Agility" considering "total converted variance" of 81.69%.

5-2- Data Analysis by Structural Equation Modeling

After extracting and explaining the relevant factors related to "Organization Agility", it is necessary to put them to hypothesis test and verification by confirmatory factor and structure analysis and factors relating to "Organization Agility". Structural equation modeling is one of the statistical modeling techniques which recently entered the behavioral field of management, organization and economics. This method is a statistical modeling technique that includes other methods like multiple regression, factor analysis, and path analysis. Its main focus is on latent variables which are defined by measurable indicators and observable variables. Using this method and by considering errors one can discover the causal relationships between variables that are not directly observable, and analyze the correlation and the intensity of effects of each variable on the others. Unlike the regression parameters which represent the empirical correlation, structural parameters explain the causal correlation. Standard estimation model of "Organization Agility" is shown in figure 2 [15].

Figure 2: Standardized Solutions Model for "Organization Agility"

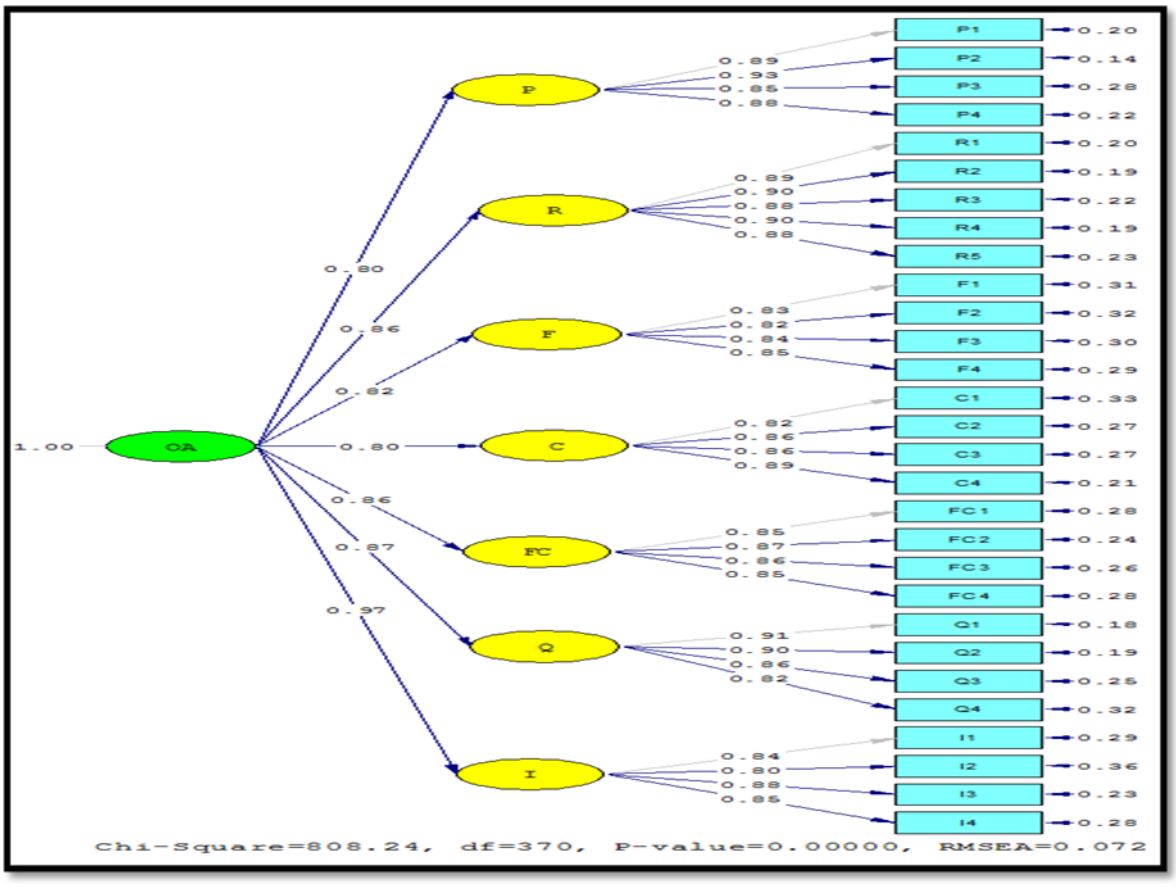

Figure 2 indicates that to what extents each of these factors explain the "Organization Agility" in the final model. The priority of these factors is as follows:

1. Intercommunity (I) with 0.97 path factor,
2. Quickness (Q) with 0.87 path factor,
3. Responsiveness (R) and Focus on the customer (FC) with 0.86 path factor,
4. Flexibility (F) with 0.82 path factor,
5. Proactive (P) and Competency (C) with 0.80 path factor.

Also, based on figure (2), the most important indicators in each aspect are:

- The most important indicators in “Proactive” are "the ability to apply reengineering and reorganization in accordance with the business environment changes" and "appropriate reaction to changes in the activities and positions of competitors" with P1 and P2 codes and correlation coefficients of 93% and 89% respectively.
- The most important indicators in “Responsiveness” are "appropriately responding to economic changes (such as economic boom or recession) and utilizing them” and "accurately understand the needs and expectations of customers and supply chain components (such as suppliers and distributors)” (with R2 and R4 codes respectively) which both have a correlation coefficient of 90%.
- The most important indicators in “Flexibility (F)” are "the ability to solve problems quickly in the face of sudden changes" and "the ability to perform multiple jobs at once" (with F4 and F3 codes respectively) with correlation coefficients of 85% and 84%.
- The most important indicators in “Competency” is " the effectiveness of communication and distribution of information within an organization" (with C4 code) with correlation coefficient of 89%.
- The most important indictors in “Focus on the customer” are "the ability to satisfying customers through resolving their complaints quickly and ethically" and "providing easy access to required information for customers and counseling them to make the right decisions" (with FC2 and FC3 codes respectively) with correlation coefficients of 87% and 86%.
- The most important indictors in “Quickness” are "the ability to provide quick response to customer needs" and "being able to quickly react in the face of alternative products offered by competitors" (with Q1and Q2 codes respectively) with correlation coefficients of 91% and 90%.
- Finally the most important indicators in “Intercommunity” are "establishing close cooperation with other organizations and groups (such as joint ventures, etc.)" and "participation in sharing information between different functional units of the organization" (with I3 and I4 codes respectively) with correlation coefficients of 88% and 85%.

Figure (3) shows the model of meaningful number of "Organization Agility".

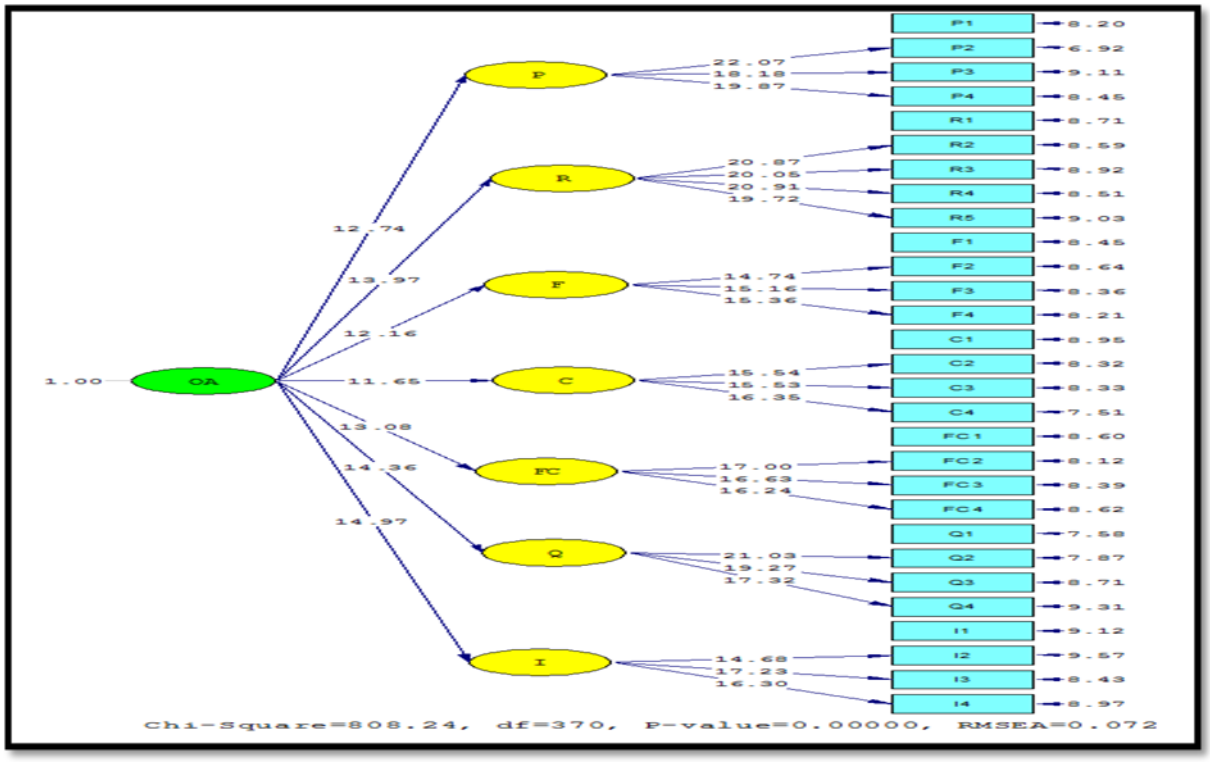

Figure 3: T-Values for “Organization Agility”

Indices of Model fitness indicate that the model is in a good condition considering appropriateness and fitness indices; because the ratio of chi-square to its degrees of freedom equals to 2.1844 which is less than allowed amount of 3 and the mean squared error is equal to 0.072, which is less than allowed amount of 0.1. Therefore, it does not need to be modified. P-value is also less than 0.05. Optimum value of goodness of the fit indicator and its modified must be more than 90% so that goodness of the fit indicator in this model is 0.96 and its modified amount is equal to 0.94, which are appropriate. As shown in Figure 3 all significance numbers related to main aspects of the model are meaningful; because their significance number is greater than 1.96. In the hypothesis of confirmatory factor analysis, "Organization Agility" model is approved.

6 - Conclusion and Recommendations

The purpose of this study is to provide a model for analyzing Organization Agility and presenting a comprehensive model for Nir Pars Company of Tehran. Based on the conducted literature review, operational aspects of "Organization Agility" are comprised of 29 items. After literature review and identification of its variables, seven factors were recognized with the greatest role in "Organization Agility". According to the analysis of results of SPSS 19 and LISREL 8.8; the priority of the variables are “Intercommunity”, “Quickness”, “Responsiveness” and “Focus on the customer”, “Flexibility”, “Proactive” and “Competency” respectively. In most aspects, results of this research are consistent with results of other researches. For example, according to Abdullah et al [1], there is a positive

relation among the acceptance of information technology and the ability of the company to become an agile competitor, and affects perceived ease of use and efficacy (usefulness) of the information technology of organizational agility indirectly through the use of real systems, technology and attitudes resulting from applying technology.

As shown in Figure 3 all T-values of main aspects of the model are meaningful, because their T-values are higher than 1.96. Consequently, the hypothesis of confirmatory factor analysis of "organizational agility" model is approved, and “Proactive” factor with t-value=12.74, “Responsiveness” with t-value=13.97, “Flexibility” with t-value=12.16, “Competency” with t-value=11.65, “Focus on the customer” with t-value=13.08, “Quickness” with t-value=14.36 and “Intercommunity” with t-value=14.97 have a meaningful and positive relation with “Organizational Agility”. Based on the results of the standard estimation model of structural equation modeling of "organizational agility", following actions are recommended to improve "organizational agility" in Nir Pars Company:

1. To improve “proactive”, it is recommended to apply reengineering and reorganization in accordance with the business environment changes. It is also possible to provide the right reactions to changes in competitors' activities and positions, clarification of goals and strategies, creating incentives for innovation and creativity and developing creative and innovative groups, establishing a proper background to heighten incentives in employees leads to Improving "proactive" index and promote "organizational agility" consequently.
2. To improve “Responsiveness”, it is possible to improve accurate understanding of the needs and expectations of customers and supply chain components (such as suppliers and distributors) in organizations, and appropriately respond to economic changes (such as economic boom or recession) and utilize them. Expertise and knowledge of responsible units may be increased, developing and implementing effective strategies for proper accountability leads to “responsiveness” and "organizational agility" consequently.
3. To improve “Flexibility” the ability to perform multiple jobs at once could be improved and promote the ability to solve problems quickly in the face of sudden changes. Briefing meetings can enhance staff understanding of the situation and moving from closed systems to open systems improves 'flexibility'.
4. To improve “Competency” effectiveness of communication and distribution of information within an organization could be promoted. It is also possible to increase top management commitment to the need for strategic planning, and upgrade the ability to formulate work strategies according to environmental changes in order to have competitive advantage. Organizing training courses and seminars to empower employees and delegate responsibilities to them and changing management practices and use of participative management style leads to improved "competency".
5. To improve “Focus on the customer” the ability to satisfy customers through resolving their complaints quickly and ethically and providing easy access to required information for customers and counseling them to make the right decisions are offered.

By attracting new customers and retaining existing ones using a variety of products tailored for market needs, "Focus on the customer" improves.

6. To improve "Quickness", the ability to provide quick response to customer needs and quickly react in the face of alternative products offered by competitors needs to be improved.
7. Finally, to improve "Intercommunity", we may establish close cooperation with other organizations and groups (such as joint ventures, etc.) and participate in sharing information between different functional units of the organization, so that "Intercommunity" improves by developing autonomous teams.
8.

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