

## Investigating the Relationship Between the learning Organization and the Components of the Organization's Agility Model

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### Article history:

Received date: 2020/06/08

Review date: 2021/08/17

Accepted date: 2021/08/23

### Keywords:

Organizational Productivity Agility,  
Learning Organization, Flexibility,  
Accountability, Organizational Change

### Abstract

**Purpose:** The aim of this study was to investigate the relationship between the learning organization and the components of the organization agility model in the metal production industries of Kaveh Industrial Town.

**Methodology:** The research method was applied in terms of purpose and mixed in terms of data type. The statistical population of the study consisted of two parts: qualitative and quantitative. The qualitative part includes experts who use the purposeful sampling method and the principle of saturation of 25 people and the quantitative part includes all employees of the metal products industry of Kaveh industrial town, who use the purposeful sampling method with special conditions in mind as 300 people. Sample size was selected. In the qualitative section, the fuzzy Delphi process was used for the relationship between the learning organization and the components of the agility model of the organization, and the interpretive structural model (ISM) was used for the classification and leveling of the agility components. In the quantitative part, the structural equation model was used using Smart PLS software.

**Findings:** The findings showed that the greatest impact on agility by transformational leadership, followed by learning organization, accountability, flexibility, organizational change, information technology and customer satisfaction.

**Conclusion:** The results showed that the factors of information technology, transformational leadership, learning organization, flexibility, responsiveness, organizational change and customer satisfaction are the main structures of the organizational agility model of metal products industries in Kaveh industrial town.

**Please cite this article as:** Mehrmanesh H, Haghighat Monfar J, Talebizadeh A. (2021). Investigating the Relationship Between the learning Organization and the Components of the Organization's Agility Model, *Iranian Journal of Educational Sociology*, 4(2): 149-158.

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## 1. Introduction

One of the main features of the 21st century is change. Globalization of markets, technical and technological developments, rapid growth of access to technology as well as changes in the characteristics, expectations and job skills of human resources, changes in the payroll system, increasing competition in the business world, environmental changes, increasing Organizational social responsibility, resource constraints, increasing customer expectations and changes in their demands indicate fundamental changes in the current century (Paterek, 2017). Such instability in the present age has profound effects on organizations. Thus, today, dominant thinking considers organizations as identities that not only react to their external environment, but also can actively and effectively define and predict their environment (Hosini et al, 2019). Organizational agility means moving towards creating organizations that have high speed and flexibility in order to respond to unstable and unpredictable environments (Hosini, et al, 2019).

One of the advantages of moving towards agility is the need to improve productivity to operate in an agile environment. Productivity agility means reacting effectively to a changing and unpredictable environment and using it as an opportunity for organizational progress and productivity (Appelbaum, et al, 2017). A set of competencies and competencies that lead to the survival and development and increase the level of productivity of the organization in an environment with continuous changes are defined as productive agility (Persson, et al, 2017). Agility is not the ultimate goal of the organization, but the means to gain competitive advantage and greater productivity in a turbulent market and is directly related to the successful performance of the organization (Ashrafi, et al, 2019). An agile organization can generally reduce production costs, increase market share, satisfy customer needs, prepare for the introduction of a new product, evaluate and estimate value-added activities, improve productivity and increase competition (Chen & Lin, 2019). It is essential to identify the steps needed to become an agile organization and to change the organization's practices and the attitude of employees to take these steps (Chen & Lin, 2019). Measuring productivity day by day has a special place in organizations, because without measuring it, one cannot make accurate judgments about the performance of the organization. Organizations need to increase their productivity capacity more than ever before in order to survive, compete and grow in the environment. It can be said that improving productivity in the current era and under the shadow of existing sanctions is difficult and consequently maximizing profits and promoting wealth in society is difficult, but the mission of management and the main goal of managers of any organization is the effective and efficient use of resources and facilities. Because labor, capital, materials, energy and information and special attention to organizational learning (Asadian, Radfar, Tolouee Ashlaghi, 2019).

In fact, organizational learning is the process of finding mistakes and correcting them. Organizational learning is a process that occurs with the acquisition of knowledge and performance improvement over time. Organizational learning is a competitive advantage for organizations. Increasing changes in science, technology, and changes in the environment and its complexities, which affect the life of organizations at every moment, make the need to pay attention to organizational learning and improve the techniques and skills of employees more than ever. Ignorance of organizational learning leads to the destruction of new thoughts and ideas that are necessary for the survival and development and even maintaining the status quo, the continuation of the flow of learning in organizations. Developing organizational learning capability prepares organizations to work in the real world of business with a view to changing management paradigms, increasing their self-regulatory and self-adaptive capabilities, and achieving organizational efficiency metrics for survival and sustainability, Makes it possible in a competitive situation (Nikpor & Salajagheh, 2014).

Much research has been done to measure the agility index and design an appropriate agility model in the organization. Farhadi, et al (2015) presented a model of sustainable supply chain agility in the brick industry of Isfahan province using thematic analysis methods and interpretive structural modeling. Based on the results of thematic analysis, 11 factors were identified including sociality, accountability, compliance,

speed, information technology, environmental protection, competence, flexibility, senior management commitment, total quality management and economics. Then, with the help of interpretive structural modeling method, it was found that the commitment of senior management is the foundation of the model and the two factors of being social and preserving the environment are the best of the model. Haditabar (2018) studied agility factors by combining expert opinions and extracting local factors, and then with the help of structural-interpretive modeling technique, the degree of influence and dependence of these factors in knowledge-based companies were examined. Examining the results of the nineteen key factors of agility identified, it was found that the flexibility of organizational structure and data analysis has the greatest influence and the ability to respond to environmental issues and the ability to change business goals has the most dependence. Jamali & Falah (2017), supply chain agility in oil and gas and petrochemical industry in five main components including organizational competence, operational competence, strategic competence, market and customer knowledge and technological competence and 15 sub-components of classification and basis. They put their conceptual model. Confirmatory factor analysis using LISREL software was used to fit the model. Research findings showed. Senior management perspective variables, employee competencies, integration, flexibility, response speed, cost, culture of learning and innovation, culture of continuous improvement, integration of strategies, understanding customer needs, market and customer sensitivity, customer satisfaction information, infrastructure. The level of access to information and technological innovations significantly affects the agility of the supply chain of businesses supporting technical equipment and engineering of the oil, gas and petrochemical industries.

Ansari, et al (2015) investigated the effect of technology management activities on agility capabilities (responsiveness, competence, flexibility, speed) in Isfahan Mobarakeh Steel Plant. The results showed that technology management activities have a positive and significant effect on agility capabilities. In their research, Mirsepasi & Farshchi (2012) devised a model for bank agility and provided tools for measuring organizational agility in Iranian state-owned banks. In this study, in addition to identifying the characteristics of organizational agility in the public sector banking industry, a model for measuring organizational agility in Iranian state-owned banks was presented and the level of readiness of Bank Saderat Iran for organizational agility was examined. For this purpose, the hexagonal model proposed for the agility of government organizations by the ETKerney Institute was used. This model has the components of organizational change, leadership, culture and values, performance management, customer service and e-government. According to the results, there is a gap between the current situation and the desired situation of organizational agility in Bank Saderat, and each of those gaps was prioritized using the average ranking method. Finally, according to the results, it seems that Bank Saderat Iran has the necessary readiness to streamline the organization and can move towards the agility of its organization. Seyed Hosini, et al (2012) identified and ranked the factors affecting the formation of organizational agility capabilities in commercial automotive companies.

The results showed that the agility capabilities of the organization and the internal supply chain of companies are less affected by environmental factors and these factors are more affected by agility enablers and environmental stimuli through agility enablers, supply chain processes and agility capabilities of the organization. Potdar & Routroy (2018) examined agility enablers in the Indian electronics industry. Capacitors were classified into categories such as adaptability, products and processes, automation, supply chain integration, competency, delegation, information transparency, production management, customer relationship management, supplier relationship management, human resource management. Ravichandran (2017) examined the relationship between conflict management, organizational destructive behavior, IT adequacy, innovation capacity, and organizational agility in large American corporations. Using the structural equation model, it was concluded that conflict management, destructive organizational behavior, information technology and innovation are related to each other, and the interaction of these four factors with each other causes rapid change in companies and companies. Achieve agility. Appelbaum, et al (2017) argue in their research that managers should look at agility as an undeniable principle to change their

strategic framework and operational activities, and promoting agility and improving the necessary capabilities in this area can contribute to the success of organizations.

Companelli, et al (2017) examined the success factors of agility in Chicago transportation companies. They categorized these factors as the goals of the organization and the employees' clear understanding of it, the level of knowledge and awareness of work teams, customers, management, organization, processes and organizational culture. This study shows that attention to such things as changes in mental models, learning, understanding new roles, changes in leadership style, decentralized decision-making and cultural changes are necessary to move successfully towards agility. Gheorghe et al (2017) examined the attention to agility approach in the Romanian electronics industry. The results of this study showed that in this industry, the concept of agility is almost unknown and has not been widely used. Abdalhamid & Mishra (2017) argue that the more prominent a culture is. It has a greater effect on agility. According to him, outstanding culture is a culture that strengthens the team spirit, pays attention to the value of learning and feedback, social interaction based on mutual trust and expands interaction and cooperation between employees and customers. Alhadid (2016) examined the effect of organizational agility on organizational performance and the relationship between these two variables in the Jordanian Information Technology Organization. According to his results, organizational agility has a significant positive relationship with organizational performance. Sajdak (2015), in his study, considered the two concepts of strategic agility and operational agility in Poland. This study showed that only the simultaneous implementation of both types of agility can bring outstanding results and competitive advantages for the organization.

Therefore, considering the high importance of organizational learning in improving the factors of information technology, transformational leadership, flexibility, responsiveness, organizational change and customer satisfaction and considering the important position of a new approach in organizational learning, this study tries to answer this main question. The research should provide an appropriate answer to whether there is a relationship between organizational learning (with a new approach in this field) and the components of organizational agility?

## 2. Methodology

The present study was a library and field study which, according to the purpose and nature, was conducted from a combined or mixed research method using a combination of qualitative and quantitative methods. The statistical population of the study was considered in the quantitative part of all experts in metal products industries of Kaveh industrial town, whose number was about 1300 people and the sample size according to the statistical population, according to Cochran's formula, was determined as 297 people and finally 262 questionnaires was collected. It is noteworthy that in order to obtain qualitative and judgmental data, fuzzy Delphi method was used, taking into account the information of 25 experts. Apparent and content validity methods were used to confirm the validity of the questionnaires. Also, divergent (diagnostic) validity was used using Fornell and Larker tests according to Table 1, considering the Likert spectrum. Cronbach's alpha was used to measure the reliability of the components. According to the data obtained in Table 2, for all variables and factors in the pre-test and final test, this ratio was set higher than 0.7. Finally, interpretive structural model (ISM) was used to classify and level the agility components, and structural equation modeling based on partial least squares path analysis was used to determine the effect of factors.

## 3. Findings

In order to identify the main structures of agility model for metal production industries using fuzzy Delphi process, three stages of questionnaire were distributed. By distributing the survey forms at each stage, the difference of experts' opinions from the average votes was also sent to each of the experts so that the opinion of the majority of votes would be announced and other experts would adjust their opinions

accordingly. Thus, at the end of the third stage, an agreement was reached. Accordingly, the structures of the organization's agility model in the metal products industry of Kaveh Industrial Town, according to experts, are; Organizational agility, information technology, flexibility, transformational leadership, learning organization, organizational change, responsiveness and customer satisfaction.

**Table1.** Comparison of the second root of the mean variance extracted of each structure with the values of correlation coefficients between structures (divergent (diagnostic) validity using Fornell and Larker test

Structures	AVE	1	2	3	4	5	6	7	8
1. Agility	0/61	0/78	-	-	-	-	-	-	-
2. Information technology	0/58	0/53	0/76	-	-	-	-	-	-
3. Flexibility	0/67	0/47	0/52	0/82	-	-	-	-	-
4. Transformational leadership	0/56	0/49	0/44	0/36	0/75	-	-	-	-
5. Accountability and responsibility	0/59	0/48	0/53	0/45	0/51	0/77	-	-	-
6. Customer satisfaction	0/65	0/36	0/41	0/33	0/39	0/40	0/81	-	-
7. Learning organization	0/63	0/39	0/44	0/37	0/42	0/45	0/41	0/79	-
8. Organizational change	0/59	0/53	0/58	0/56	0/55	0/57	0/48	0/51	0/63

The root values of the mean variance extracted in the row and column are the highest. This indicates the existence of divergent validity among the research variables.

**Table2.** Cronbach's alpha value of research variables

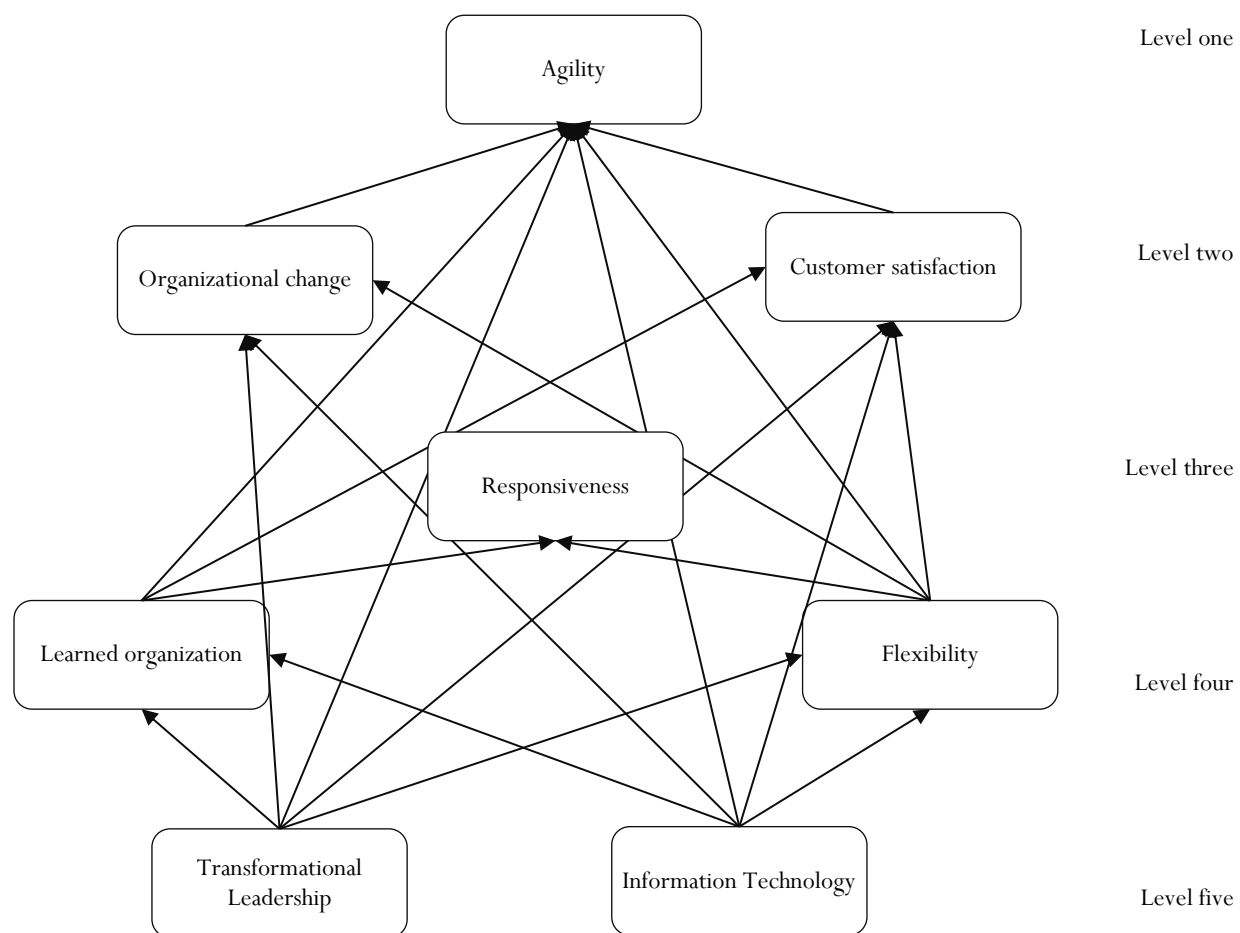
Factors	Cronbach's alpha pre-test	Cronbach's final alpha
Organizational Agility	0/715	0/736
Information Technology	0/814	0/838
flexibility	0/746	0/779
Transformational Leadership	0/753	0/794
Accountability and responsibility	0/819	0/836
Customer satisfaction	0/803	0/825
learned organization	0/769	0/774
Organizational change	0/745	0/861

In order to classify and level agility structures, interpretive structural modeling process was used. For this purpose, first a structural interaction matrix was formed by polling experts and then it was converted into an initial achievement matrix using the 0-1 placement law.

Table 3 shows the structural self-interaction matrix. The letter V indicates a one-way relationship between a row and a column, the letter A indicates a one-way relationship between a column and a row, the letter X indicates a two-way relationship between a row and a column, and the letter O indicates a lack of communication between two structures. For example, in the relationship between communication technology and organizational flexibility, the letter V is observed, which indicates a one-way communication from row to column. This means that there is a one-way communication from communication technology to organizational flexibility. Violation property was used to achieve the final access matrix. Once the final achievement matrix is obtained, the level of the structures in the final model should be determined. For this, first the initial set (input) and the accessible set (output) is defined and then their share is calculated. The first set is the set in which the number of structures in columns appears as 1 and the achievable set is the set in which in the final access matrix, the number of structures in the row appears as 1. By obtaining the subscription of these two sets, the subscription column will be completed; the first row in which the subscription of the two sets is equal to the achievable set, the first priority level is defined. After determining the level, remove the structure or structures whose surface has been determined from the table and repeat until the remaining structures are also determined. After determining the final level, the final shape of the structures will be drawn using the specified levels. In the research conducted after five stages, the final model of agility in metal industries of Kaveh industrial town in five levels is presented in Figure 1.

**Table 3.** Final access matrix for agility model structures

Structures	Agility	Information Technology	flexibility	Transformational Leadership	Responsiveness	Customer satisfaction	learned organization	Organizational change	infiltrate
Agility	1	0	0	0	0	0	0	0	1
Information Technology	1	1	1	0	1	1	1	1	7
flexibility	1	0	1	0	1	1	0	1	5
Transformational Leadership	1	0	1	1	1	1*	1	1	7
Responsiveness	1	0	0	0	1	1	0	0	3
Customer satisfaction	1	0	0	0	0	1	0	0	2
learned organization	1	0	0	0	1	1	1	0	4
Organizational change	1	0	0	0		0		1	2
Dependence	8	1	3		1	5	6	3	4



Level one

Level two

Level three

Level four

Level five

**Figure1.** Leveling of factors in the agility model of metal production industries of Kaveh industrial town

Now, according to the research findings, the effect of structures on each other, in other words, the relationships between structures in the model of agility of the metal products industry in Kaveh industrial town will be examined using a structural equation model based on partial least squares. To use the model, first the factors extracted from the qualitative part and the fuzzy Delphi process is standardized and the relationships between these factors are extracted from the interpretive structural model. Smart PLS software was used to obtain confirmatory factor analysis. This software does not have the same presuppositions as LASERL or E-MUS, and this is one of the advantages of Smart PLS software. The results of this stage of the research are presented in Figures 2 and 3. According to Figure 2 and standard coefficients, it can be argued that the strongest relationship is between information technology and customer satisfaction and because they have the highest path coefficient with a value of 0.794.

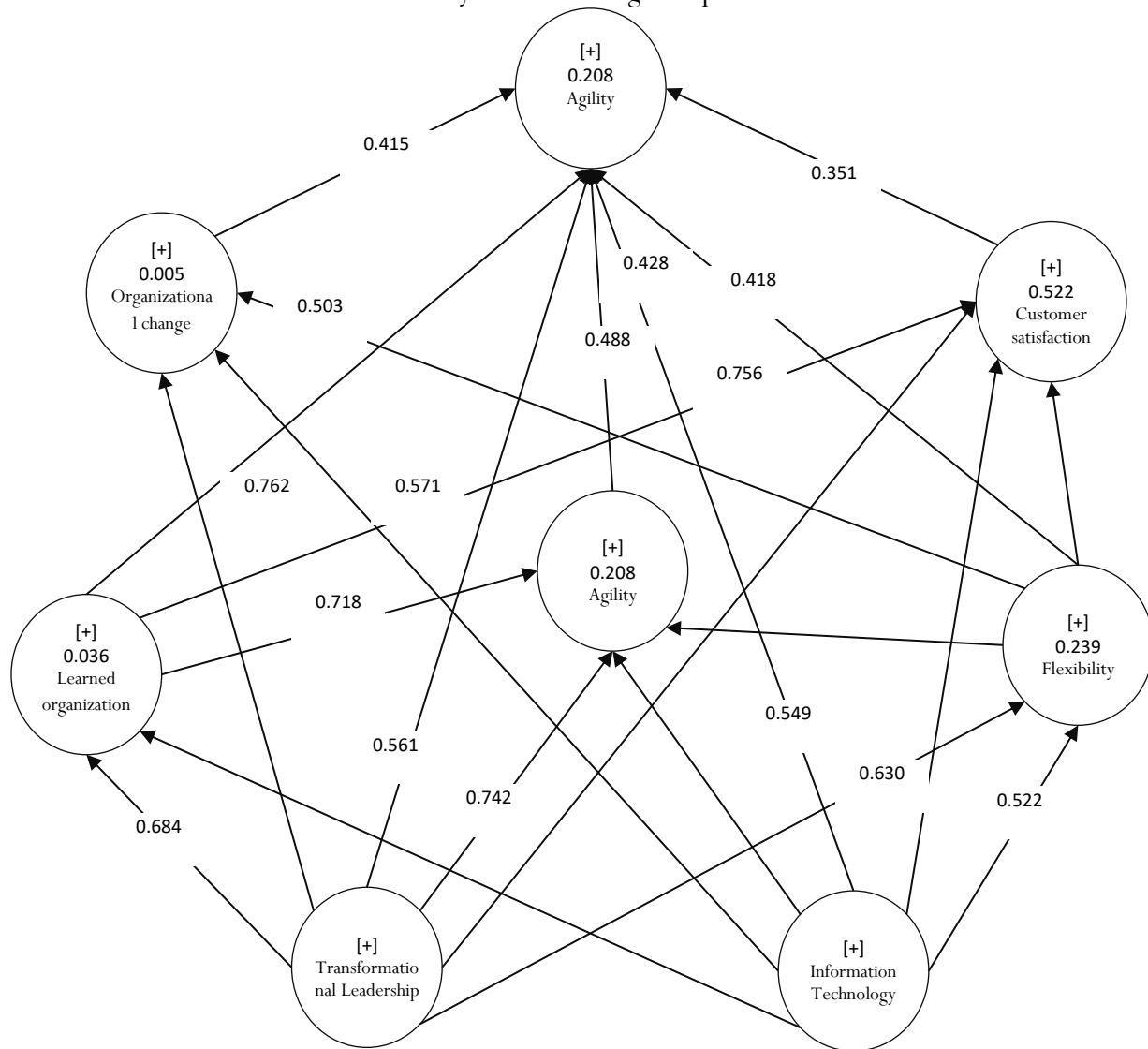
**Figure2.** Conceptual model of research in the case of estimating standard coefficients and eliminating variables with low factor load

Figure 2 also shows the research model in the significant state of coefficients (t-value). This model actually tests all measurement equations (factor loads) and structural equations (path coefficients) using t-

statistic. According to this model, the path coefficient and factor load are significant at the 95% confidence level.

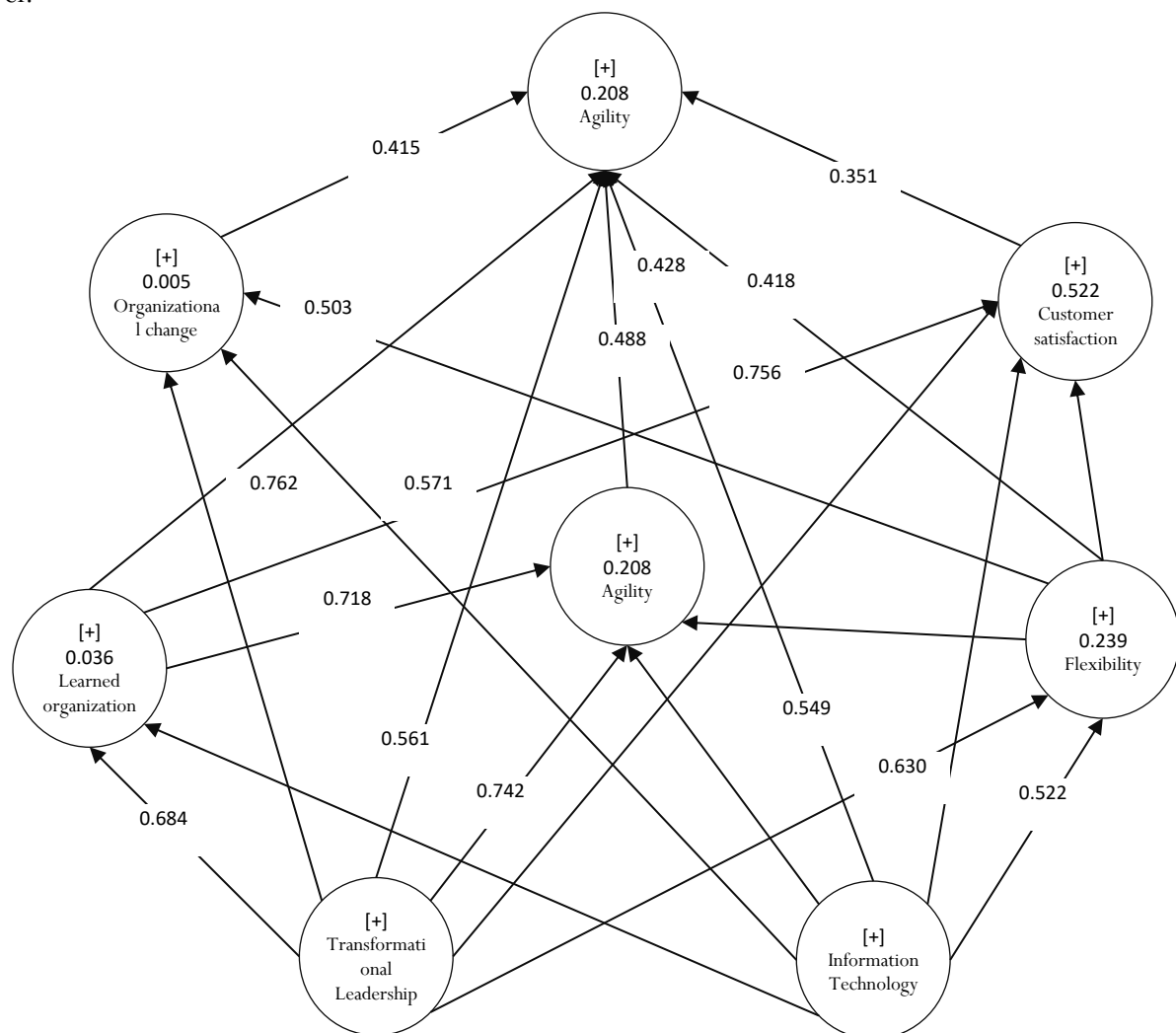


Figure3. Significance coefficients of hypotheses in the model

#### 4. Discussion

Organizations need to be agile to survive and be more productive. According to the results of this research, transformational leadership has the greatest impact on the agility of metal products industries in Kaveh town. The goal of transformational leadership is to ensure that the path to the goal is clearly understood by internal actors and can overcome potential barriers within the system, as well as to encourage actors to achieve predetermined goals. These characteristics enable employees to accept possible changes in order to achieve the goals set by the organization and to adapt to these changes. Therefore, the whole company as a single system will feel the changes in it and will be ready to face any change without being harmed by those changes, which will make the industry an agile industry. Customer satisfaction is also another important factor on organizational agility. Customers who are more satisfied with the company express their positive experiences to others and thus are a means of advertising for the company. As a result, the cost of attracting new customers is reduced. In the face of today's turbulent and changing world, companies need a wide range of changes to meet customer needs and must be ready to face new changes at any time, so they can be satisfied with customer satisfaction. Become an agile organization. The second part of the research is related to the leveling of agility components.



This leveling clarifies how to go through different levels to move towards agility. According to the findings, the first level of the agility model of metal products industry in Kaveh industrial town includes the agility variable, because according to experts, agility is a factor that is affected by other factors in the model and does not affect any of them. The proposed model is to determine the state of agility using other extracted factors - which naturally leads to agility, is affected only by other factors and is not effective. The second level of agility model includes two variables of customer satisfaction and organizational change. These two variables affect organizational agility and are influenced by other effective factors of the model. Naturally, customer satisfaction can be considered an influential element rather than an effective element. This can also be applied to organizational change, ie these two variables have little effect on the relationships within the model, but have a high impact that makes them in the second floor of the agility model of metal production industries in Kaveh Industrial Town.

The third level of the model includes the accountability element. This element is influenced by the factors of learning organization, transformational leadership, information technology and flexibility and affects the elements of agility and customer satisfaction. Therefore, considering that it affects the two elements and in a way has a more prominent role in the relations within the model than the two elements discussed in the second class and on the other hand has less influence than other factors, this element in the class or The third level of agility model is in the metal products industry. The fourth level of agility model of metal products industries of Kaveh industrial town includes elements of flexibility and learning organization. These two elements are far elements that change some of the other factors involved in the model by changing them, in other words, more elements are effective and have less impact. Learning organizations affect the elements of accountability, customer satisfaction and agility and flexibility also affect the elements of customer satisfaction, agility, organizational change and accountability, and on the other hand are affected by only two elements of transformational leadership and information technology, so it is obvious that To be examined at a lower level than other factors.

The fifth level of agility model of metal industries of Kaveh industrial town, which is the lowest level of agility model in the mentioned model, includes two elements of information technology and transformational leadership. These two elements affect all the elements and in contrast, they are not affected by other elements of the agility model of metal production industries of Kaveh industrial town. The relationships evaluated in the model of agility of metal products industries of industrial town products using path analysis showed that the above effects are significant. This leveling of elements can be considered as one of the main innovations of research because it has not been considered in other researches so far. Therefore, it is suggested on this basis: 1- Researchers should conduct research in the field of comparative comparison of the required level of agility with organizational learning in different industries. 2- Proposing to do the same research in service organizations. 3- Doing the same research in other industries such as chemical, food, pharmaceutical, non-metallic, electrical and electronics, cellulose and textile industries. 4- Conducting research under the title of examining challenges and presenting new approaches in organizational learning.

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