THE EFFECT OF DIMENSIONS OF KNOWLEDGE SHARING ON A VARIETY OF STRATEGIC MIND MAP OF MANAGERS AND EMPLOYEES

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ABSTRACT

Based on cognitive school of strategic management, the mental (intellectual) map of managers and employees is highly effective on survival and development of their companies .The number of mental maps that managers and employees of a company have on situations and categories (quantity) and the quality (accuracy and precision) of mind maps can be decisive factors in the success of their companies. One of the most important factors affecting the mind map is knowledge sharing. This study seeks to explain the dimensions of this impact. Based on objective, this is a descriptive - explanatory study, while it is an applied one according to the result. It is cross-sectional research based on time, and a surveying according to the methodology. The target population members included the managers and employees of a large industrial complex in the North West of Iran. The sampling method was a stratified randomized approach, and the sample size was calculated using the Cochran formula as 237 subjects. The data were collected by a researcher-made questionnaire containing 36 questions.

The results showed that knowledge sharing affects the formation of a strategic map of managers and employees significantly and differently through each of the three categories of organizational factors, personal factors, and knowledge factors. This means that each of these knowledge sharing approaches affects each of the eight mind maps with different quality and quantity. Also, knowledge sharing is not a universal current among all managers and employees; in addition, it is unclear that sharing of knowledge will essentially boost more useful and functional mental maps, and perhaps, it would act otherwise. Therefore, it is necessary to conduct the process of knowledge-sharing to continuously integrate and improve mind maps of decision-takers and decision-makers.

Keywords: Mental (intellectual) map, Knowledge sharing, Organizational factors, Personal factors, Knowledge factors

1. INTRODUCTION

Today's world is a world of upheavals and dramatic changes in technology that its structure of thought is full of deepening and use of knowledge and attention to its sharing as well as using knowledge-oriented manpower instead of functional human resources. Hence, the management of any organization intends to use knowledge and share it as a means to maintain the position and correct and improve the mind (mental) map of its employees (JAAFARI; GHOUCHANI, 2010).

Making short-term inconsistent and contradictory decisions indicates the speed of overtaking of switched situations to their realization by decision-takers and decision-makers. Therefore, changes in the intellectual approach of managers and a strategic thinking in their intellectual models play an important role in the management of these inconsistencies (JAAFARI; GHOUCHANI, 2010).

In other words, having a prismatic and multi-faceted attitude to an organization, and linking the past, present and future to use the opportunities, thinking and analysis comprehensiveness, seeing systematic change as a critical matter knowledge and encouraging to modernity and creativity are as features of managers and employees with strategic thinking models (RYDÉN; RINGBERG; WILKE, 2015).

Intellectual models are the representation of reality to give meaning to the received information signs (SULONG, et al. 2013). These models show that how

interpreted information would affect the decision-making process and limit the considered solutions (SULONG, et al. 2013).

According to Senge et al. (1992), mind models or maps consist of assumptions, generalizations or even images that influence the understanding of managers and employees of the organization issues their operation. Therefore, the mind map forms the most important basis of knowledge structure of individuals and is classified and analyzed depending on the complexity, accuracy, precision and dynamics (CHOURNAZIDIS, 2013).

Organizations see knowledge as a strategic resource to maintain their dynamics and survival during environmental changes and developments and extensive advances; since, this important asset can make organizations flexible more than ever so that they can realize their strategic objectives in environmental challenging conditions.

With the substitution of knowledge workers instead of manual workers (DRUCKER, 1993), the need for knowledge management and its sharing has been widely considered (BANI-HASHEMI; MAJDI, 2015); as knowledge is not valued by itself in the organization and should be used by people. Hence, it is necessary to focus on people who apply knowledge and generate knowledge (LAI, et al. 2014).

Nonaka (1991) also believes that successful organizations in this century are those constantly produce new knowledge and disseminate is widely throughout the organization and present as new technologies. In other words, when people share information, effective activities, views, experiences and benefits with others, they improve productivity in different parts of the organization. Its successful implementation within the organization leads to sharing of intellectual capitals through which organizations can improve their efficiency and reduce training costs and the risks of uncertainty (JOHANSSON; MOEHLER; VAHIDI, 2013).

Today, with its innovative and dynamic features, knowledge has quickly put aside the information society and replaced it with the knowledge society, and thus, has emerged as a vital resource for organizations in the field of competition and as a factor for achieving sustainable competitive advantage (AKHAVAN, et al. 2014).

Thus, the transfer and sharing of knowledge in organizations seems to be necessary, as in the process of sharing knowledge, the employees share their

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experiences and skills in all parts of the organization (JOHANSSON; MOEHLER; VAHIDI, 2013). This can affect the formation of intellectual map of managers and employees, and lead to making of correct and productive decisions by people.

It can be then claimed that Iran Transfo is an organization that desperately needs knowledge and sharing it to benefit from correct mind map among its employees and managers. According to the atmosphere prevailing the business environment, the need for achieving framework to improve and modify the mind map of mangers is inevitable, as an mind map includes inner cognitive structures made by managers and staff explicitly or implicitly to depict the subject area and achieve a correct understanding and interpretation of the environment surrounding their working scope (AKHAVAN, et al. 2014).

Mind map (model) is an inner image of an outer reality. Johnson-Laird (1983) has described the mental map "as a psychological representation of actual, perceived or assumed situations in the mind. Peter Senge (1992) has defined the mind map as highly deposited assumptions in the mind and generalizing the images and imaginations. Norman (1998) and Olson and Finn (1993) described the mind map as a knowledge that the user has on the operation of the system, its various parts, processes, components interactions and their impact on each other (CALVO-MORA; NAVARRO-GARCÍA; PERIAÑEZ-CRISTOBAL, 2015).

Nowadays, knowledge sharing is of utmost importance due to creation of competitive advantage, innovation, increased efficiency and cost reduction and is considered as one of the main components in the knowledge management cycle for organizations to achieve success. On the other hand, a mind map is a diagram to display the words, ideas or elements arranged orderly around an idea or a keyword.

Intellectual or mental maps are used to generate, visualize and categorize the ideas as well as tools to organize, study and manage projects and solve the problems. One of the first objectives of mind maps is helping in education to organize knowledge in a structured form. Research shows that the structure recognition of knowledge in learning with mind map is better compared to the traditional methods (GARRIDO-MORENOA; LOCKETTB; GARCÍA-MORALES, 2014).

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2. THEORETICAL FOUNDATIONS

Today, knowledge is a prerequisite for any progress in various aspects of our lives. The growth of knowledge has been very rapid in recent years, and on the other hand, knowledge is seen as a valuable and strategic resource and that can create competitive advantage and provide products and services with appropriate quality, which is the only way to survive in competitive and always changing world of today's economy.

Hence, it appears essential to identify the prerequisites for knowledge management in the organization and paving the route for creation, transfer and application of knowledge. In the information age, knowledge is the most important factor for long-term success of an individual and an organization.

Peter Senge believes that the only source of competitive advantage in the future would be the knowledge owned by an organization, which will improve an organization's ability to learn faster. The growth of knowledge has been very fast in recent times, so that 80% of technology and knowledge findings as well as 90% of all the knowledge and technical information in the world has been generated in the twentieth century.

Every five and a half years, the volume of knowledge doubles, while its average lifetime lasts less than four years. Thus, such a change has created a new attitude in business management called as "knowledge management" (ABEDINPOUR, 2012).

- *Definition of knowledge sharing*

Knowledge sharing has been described as "sending and distribution activities of knowledge by a person, a group or an organization to an individual, a group or other organizations". Knowledge sharing will not happen unless the staff and working groups of the organization would have a high level of cooperative behaviors (AFRASYABI; ETEBARIAN, 2016).

- *Importance of knowledge sharing*

Knowledge sharing leads to reduced costs, improved performances, improved customers' service providing, reduced new product development time, reduced time

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delay in the delivery of goods, and ultimately reduced cost of access to valuable types of knowledge in the organization (AMOZAD; ABBARIN, 2015).

Sharing and donation of knowledge means communicating with others to transfer own knowledge and intellectual capital to them, while knowledge gathering includes communicating with others to achieve knowledge and participating in their intellectual capital. Both currents are active processes and both are actively associated with the fact that how much others have knowledge and awareness, how actively they consulted with others so that they can acquire knowledge and learn (AMOZAD; ABBARIN, 2015).

- ### *Barriers to sharing knowledge*

Since reduction in information reflects reducing in power, transfer of knowledge for learning organizations is seen as a basic element. Knowledge should be distributed conveniently and fast. However, the following three conditions trouble the effective transfer of knowledge:

1. Critical business processes are accessible only to a few people.

2. Knowledge would not be accessible in the right place or time.

3. Transfer and restructuring would increase the security coefficient of knowledge.

Unfortunately, there are many obstacles lying ahead of knowledge current in the organization that senior and middle managers of the organization must act to fix them. These obstacles can be divided into three categories: Organizational (structural), individual (human) and technological

Identifying barriers to knowledge sharing within an organization plays an important role in the success of a knowledge management strategy (SHAHRAM; JAMALI, 2015).

- ### *Mind mapping (Based on its initial concept)*

Tony Buzan, the breeder and developer of mind map ideas once said: "An ordinary employee has officially spent between 1000 and 10,000 hours to learn economics, history, language, literature, mathematics and political science, but the same employee spends less than 10 hours for learning the art of using mind creativity".

This belief led him to nurture and develop the mind map, which is one of the most effective skills in the process of creativity. The mind freely pours out its contents so that as the information are transmitted from the mind onto the paper, they would be set as separate clusters.

Recent studies show that the "duration of mind focus" on one issue is between 5 and 7 minutes. This difference is related to the rate of the audience interest. Man acts his best between these 5 to 7 minutes intervals. The mind mapping has the advantage of using the power of excellent and intense activities during these short periods, allowing the individual to transfer all thoughts and mind contents to the paper in just a few limited minutes (JAAFARI; GHOUCHANI, 2010).

- *Process of creating a mind (intellectual) map*

  o *Starting from the middle of the page*

This is the property of brain to focus on the center of the page. Thus, it is better to start your work by writing a word or putting a relevant figure in the center of the page.

  o *Failure to deal seriously with the issue*

Write the first thing that comes to your mind, even the ridiculous and irrelevant points.

  o *Do not limit your mind*

The mind map is not supposed to be the ultimate solution for an issue that you are thinking about. Relate whatever comes to your mind to the central theme.

  o *Expanding the branches*

Add a sub- directory for every issue connected to the center and write a short description. The subjects related to each branch can be connected to each branch to expand the map.

  o *Thinking fast*

Usually in such a situation, your mind becomes full of different ideas. In this case, turn all the ideas quickly to words or images, and put them on paper.

  o *There are no limits*

As already said, there are no limits to create a mind map, and you can use any type of writing instruments. Signs, lines and branches can have any color.

    o *Avoiding premature judgments*

At the time of mind map creation, you are always in terms of brainstorming. Thus, do not stop your mind to verify whether something you've written is true or false. Unrelated things that you have written would may be used later.

    o *Do not stop*

Try your hand move on paper. If nothing comes to your mind, draw bare branches until mind will find new ideas. You can even change colors to energize your mind or attach your paper to the wall to have a new physical conditions for thinking.

    o *Add the relationships and branches*

Sometimes, ideas and items related to them appear quickly by starting to think. Always try to first connect all items to the central core on the page. Do not consider any limitations in connecting what subject to which branch. Organizing and classification can be done later. Even in presence of common aspects between different branches, connect them together with a line. Compliance with these steps help you to creatively foster whatever you're looking for (CHOURNAZIDIS, 2013).

3. MIND MAP MODELS

- ### *Intellectual map of nested circles*

The circular map is only two concentric circles. Put your key ideas in the middle of the circle and put anything else about those ideas outside the circle. This is like a basket that collects words or ideas that are not necessarily related (JAAFARI; GHOUCHANI, 2010).

- ### *Bubble intellectual map*

The bubble map can seem like a network or cluster, but this is not the case. Bubble Map is just to describe things and can be effectively used in combination with other maps.

- ### *Double bubbles map*

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A double bubbles map represents a kind of thinking containing two comparisons and showing similar and different quality of things. In the double bubbles map, similarities are in the center, while the differences are outside the center.

- ***Tree map***

The basic process of thinking for tree map includes categorizing and organizing, and this is just a general plan. The tree map contains the entire problem, the main idea and details, and helps in seeing the text understanding text structures.

- ***Brace map***

Brace map helps to define the relationships of the whole and components and is used for objective things, which can be separated to parts or subsidiary mind maps. A Brace map differs from the tree map, since you separate things physically with a Brace map, while the tree map indicates the categorization of components in which you will put the main ideas and details. However, the Brace map shows the entire mind maps.

- ***Flow map***

If you want to work with successive events, the flow map would be useful. First of all, you can use the circular map to list things; for example, what you want to do today. Then, you can prioritize them and order them.

- ***Multi-flow map***

The multi-stream maps are a strong type of maps showing the cause and effect, and events are in the middle of the flow.

- ***Bridge map***

The bridge map is used to show comparisons and parallels. It is useful to show the relationship of something concrete or abstract (JOHANSSON; MOEHLER; VAHIDI, 2013).

- ***Research background***

Ogiela (2015) conducted a study titled as "Advanced techniques of knowledge management and access to strategic information", which discussed advanced

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techniques of knowledge management based on information sharing and sharing algorithms for strategic information series.

Advanced techniques of knowledge management will be discussed by using an example of the application of encryption-graphical algorithms in the information management processes and access to them. Limited access to enterprise strategic information means that this type of data should be stored securely and should not be disclosed to unauthorized persons. Encryption algorithms to share strategic information keep such information confidential and private and ensure no unauthorized access to them.

Donate and de Pablo (2015) provided a study entitled as "Knowledge-based leadership in knowledge and innovation management practices". The aim of this study was to test the role of a certain type of knowledge-based organizational leadership in knowledge management (KM) of initiatives, which is seeking to achieve innovation and invention.

This article provides the experimental development of mediating effect of KM practices in the relationship between knowledge-based leadership and innovative performance. In line with previous scientific studies, the results show that although KM approaches are themselves important in innovation goals, the presence of this type of leadership stimulates and develops the use of exploration, identification and exploiting approaches.

The main inference indicates that as a result of the development and application of methods KM, companies would be able to improve their performance and efficiency in the product innovation.

Calvo-Mora et al. (2015) conducted a study entitled as "A project to improve knowledge management and key occupational results through EFQM Top Model". The aim of this study was to analyze potential of EFQM top model for designing and implementation of a knowledge management project (KMP) that improves key occupational results.

The results show that how the EFQM top model can provide a valid framework for the implementation of KMP. The use of process and the participation of suppliers and partners' method is as key factors for KMP, and causes the KMP to have a significant impact on key occupational outcomes.

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Fidel et al. (2015) provided a study entitled as "The Impact of collaborative innovation on customer knowledge management and its performance". This article examines and tests a model to see how both variables act as primary or former elements of CKM. This model also of suggests the impact of common cooperation of customer and CKM on marketing results. The findings of this study show that collaborating with customers and orientation towards innovation are the necessary primary elements for effectiveness of CKM and marketing.

- Methodology: Conceptual Model
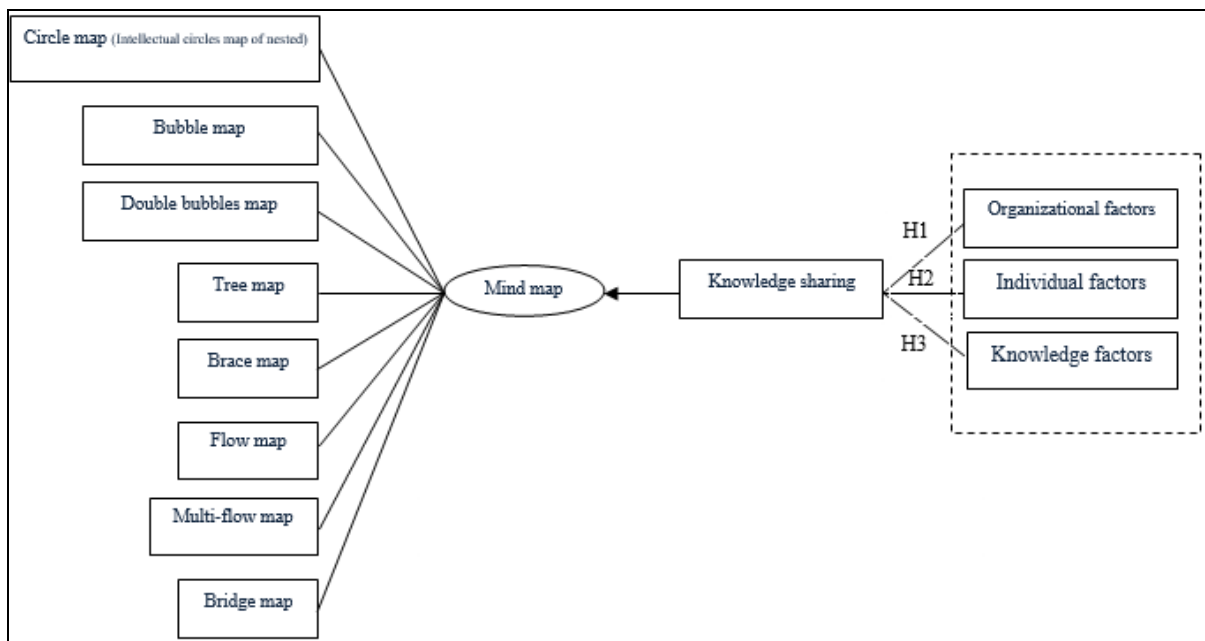
The research conceptual model is as follows:

Figure 1: Research conceptual model

4. RESEARCH TYPE AND METHODOLOGY

This study was an applied one regarding the result; since, the research results would be used in Iran-Transfo Company and would be available to the managers of other similar companies as well. Based on objective, it was a descriptive-explanatory research, while it could be seen as surveying one according to data collection approach and a correlational one based on the relationship between variables and cross-sectional according to time.

- ***Target population***

The study target population included all managers and employees are working in Iran Transfo Company estimated as 578 subjects.

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- *Sample size*

The members of the sample were calculated as 237 subjects as follows:

n: Sample size

N: Population size

$$n = \frac{N.Z_{\alpha/2}^2.\delta^2}{\varepsilon^2(N-1)+Z_{\alpha/2}^2.\delta^2}$$

δ: SD of the initial 30-memebr sample for questionnaire = 0.484

ε: Permitted error rate = 0.05

Z: Single normal variable corresponding to confidence level of 95% (Zα / 2 = 1.96)

The sample size was calculated for the population through Cochran's formula as follows:

$$n = \frac{N.Z_{\alpha/2}^2.\delta^2}{\varepsilon^2(N-1)+Z_{\alpha/2}^2.\delta^2} = \frac{578 \times (1.96)^2 \times (0.484)^2}{(0.05)^2 \times (578-1)+(1.96)^2 \times (0.484)^2} = 236.98 \cong 237$$

5. SAMPLING METHOD

The sampling method was a stratified randomized approach proportional to population size. In this study, the population consisted of two classes of managers (20 leaderboards and 6 deputies, totaling 26 people) and staff (150 staff experts, 187 operational experts and 215 ordinary employees, a total of 552 people) working in Zanjan, Iran Transfo Company. The sample size in each class than to the population was obtained from the following formula:

- Number of samples per class: = (Nh / N) × n

- Nh: Number of people in that class: (26 ÷ 578) × 237 = 10.66 = 11 = Number of samples for the managers class

- N: Total number of the population: (552 ÷ 578) × 237 = 226.34 = 226 = Number of samples for the staff class

- n: Sample size

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According to stratified randomized sampling method, the study statistical sample included 11 managers and deputies and 226 staff and operating experts and ordinary employees. Based on the calculated sample size, 237 questionnaires were required. In this regard, 237 questionnaires were distributed among the organization managers and staff by stratified randomized sampling method. Finally, 202 questionnaires were returned and used.

- Data collection tools and methods

The measurement tool of variables was a researcher-made questionnaire consisting of 36 multiple-choice and open-ended questions. The questionnaire included three parts:

- In the first section of the first part, the purpose of data collection by questionnaire and the need for cooperation of respondents in providing the required data were described. For this purpose, the value of data obtained from questionnaires were emphasized so that the respondents would answer the questions appropriately. It was also mentioned that the data would be confidential and would not be used for something other than scientific applications.

- The second part of the questionnaire included demographic questions, which encompassed general and demographic information of respondents such as gender, age, level of education, organizational position and job experience.

- The third part section contained questions to measure the variables.

- Knowledge sharing analysis method (Dependent variable)

The indicators of operational measurement of knowledge sharing were extracted as independent variable from Yang and Chen Model (2007), consisting of three components of organizational factors, personal factors and knowledge factors, which were measured with 18 question items.

- Measurement method of independent variable (Intellectual pattern)

Independent variable, "strategic mind map", was also extracted from Charles Addams model (1970), including maps of nested circles, bubble, doubled bubbles, Brace, tree, stream and multi-stream, which were measured in the form of 18 question items (11 quantitative and 7 qualitative questions).

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- Data analysis

- Data analysis with descriptive statistical techniques

In this study, demographic questions of the questionnaire related to the community of managers and employees working in Iran-Transfo Company were in five areas of gender, age, education level, organizational post and work experience, which were answered in 202 questionnaires completed by managers and employees working in the company.

- Data analysis with inferential statistics techniques

The inferential statistics was used to test the hypotheses of the study, make conclusions and ensure the integrity of generalizing the results to the community. For this purpose, some tests were used in this study:

- Kolmogorov-Smirnov test: To assess the normal distribution of data

- Structural equation modeling: To investigate the research hypotheses

Accessory tests: Kolmogorov-Smirnov test: For assessment of knowledge sharing status and strategic intellectual map of employees and managers of Iran-Transfo Company

- Correlation test

Due to non-normal distribution of data, the Spearman correlation test was used to examine the relationship between intellectual maps and knowledge sharing (Table 1).

Table 1. Spearman test

			nested circles	bubble	doubled bubbles	tree	Brace	stream	multi-stream	mind map
Spearman's rho	Individual	Correlation Coefficient	.086	.180[*]	.191[**]	.176[*]	.158[*]	.011	.072	.198[**]
		Sig. (2-tailed)	.226	.010	.007	.012	.025	.880	.306	.005
		N	202	202	202	202	202	202	202	202
	Organizational	Correlation Coefficient	.131	.123	.201[**]	.177[*]	.109	.054	.083	.220[**]
		Sig. (2-tailed)	.063	.081	.004	.012	.123	.447	.238	.002
		N	202	202	202	202	202	202	202	202
	Knowledge	Correlation Coefficient	.179[*]	.156[*]	.210[**]	250[**]	.246[**]	.133	.218[**]	.325[**]
		Sig. (2-tailed)	.011	.027	.003	.000	.000	.059	.002	.000
		N	202	202	202	202	202	202	202	202

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6. THE CORRELATION TEST RESULTS REVEAL THAT:

1. There is a significant relationship at 95% confidence level between individual factor of knowledge sharing and bubble, tree and Brace intellectual maps. Also, there is a significant relationship at 99% confidence level between individual factor of knowledge sharing and doubled bubble intellectual map. However, there is no significant relationship between individual factor of knowledge sharing and the rest of the intellectual maps.

2. There is a significant relationship at 95% confidence level between organizational factor of knowledge sharing and tree intellectual map. Also, there is a significant relationship at 99% confidence level between organizational factor of knowledge sharing and doubled bubble intellectual map. However, there is no significant relationship between organizational factor of knowledge sharing and the rest of the intellectual maps.

3. There is a significant relationship at 95% confidence level between knowledge factor of knowledge sharing and bubble and nested circles intellectual maps. Also, there is a significant relationship at 99% confidence level between knowledge factor of knowledge sharing and doubled bubble, tree, Brace and multi-stream intellectual maps. However, there is no significant relationship between knowledge factor of knowledge sharing and the rest of the intellectual maps.

- Testing the research hypotheses

The research hypotheses were tested with structural equation modeling technique. Therefore, after developing model for each of the hypotheses, the designed model was tested by using LISREL 8.8 software as below.

A. Main hypothesis

Knowledge sharing has an impact on strategic intellectual map of managers and employees.

B. Sub-main hypothesis

o Organizational factors of knowledge sharing have an impact on strategic intellectual map of managers and employees.

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o Individual factors of knowledge sharing have an impact on strategic intellectual map of managers and employees.

o Knowledge factors of knowledge sharing have an impact on strategic intellectual map of managers and employees.

7. TESTING THE MAIN HYPOTHESIS

Knowledge sharing has an impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

Two statistical hypotheses of the test are as follows:

H0: Knowledge sharing has no impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

H1: Knowledge sharing has an impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

The final structural equation model of the main hypotheses is shown in Figure 2, which represents a high impact coefficient on the relationship between the variables of "knowledge sharing" and "employees' strategic intellectual map".
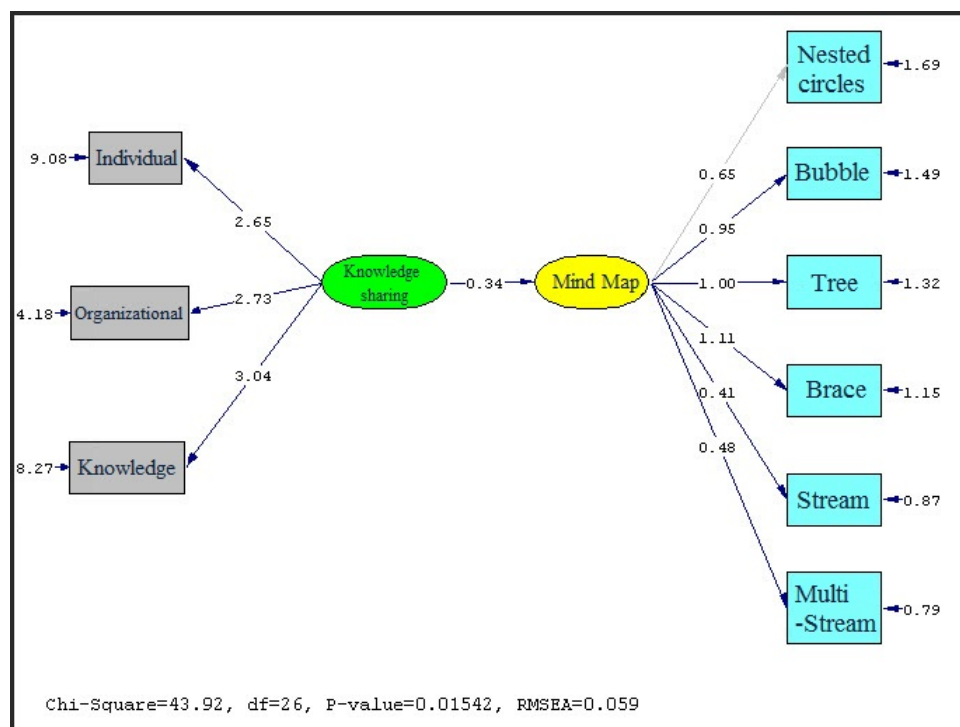

Figure 2: Chart of coefficients obtained from the computations of SEM of the main hypothesis

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When a model is appropriately determined and the data are entered correctly, the model fitting to the assumed model needs to be evaluated. A number of indicators are used to assess that how much the model can describe the relationships seen between the measurable variables.

These indicators are named in different groups that the absolute and comparative indicators are the most important ones. Absolute indices are those allocated merely to calculate X2, X2 / df and model coefficient of determination. The most important indicators are X2 and X2 / df, which are indicators for assessing the suitability of the model fitting. Two other absolute indicators of fitting are as follows:

- Standardized root mean square residual (RMR), which is the mean of differences between observed and expected correlations among the estimate of all parameters

- Root mean square error of approximation (RMSEA), which adjusts the simplicity of the model

Also, the findings regarding the relationship between knowledge sharing and strategic mind map components of managers and employees in the studied company (according to standardized coefficients calculated for indirect effect between variables) show that the sharing of knowledge has had a positive and significant indirect effect on improving the components of strategic mind map of managers and employees. In the figure below, the value of T is given for the main hypothesis:
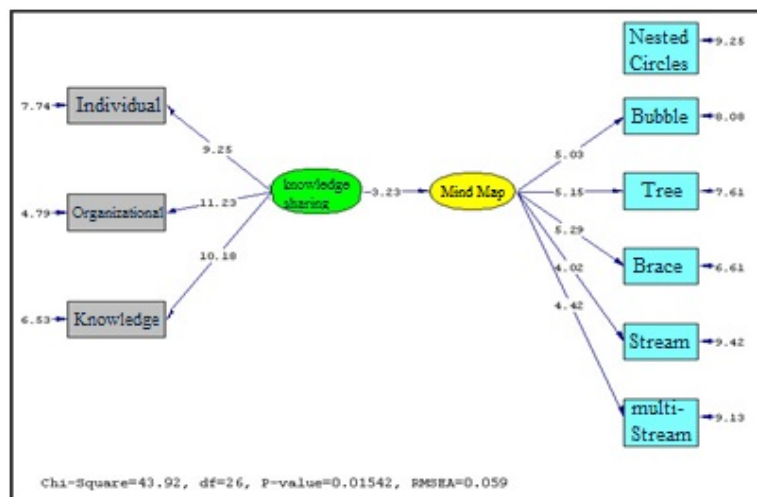

Figure 3: Value of T for the relationship between knowledge sharing and intellectual map

As can be seen in the figure above, the value of T indicates that there is a significant relationship at 95% confidence level between knowledge sharing and intellectual map. The omission of the nested circles intellectual map in the calculation of T is due to the amount of error calculated for this type of mind map, which is shown in Figure 2 and is quite distinct with a very pale line.

- ***Testing sub-hypothesis 1***

Organizational factors of knowledge sharing have an impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

H0: Organizational factors of knowledge sharing have no impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

H1: Organizational factors of knowledge sharing have an impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

The final structural equation model of the sub-hypotheses 1 is shown in Figure 4, which represents a high impact coefficient on the relationship between the variables of "organizational factors of knowledge sharing" and "employees' strategic intellectual map".
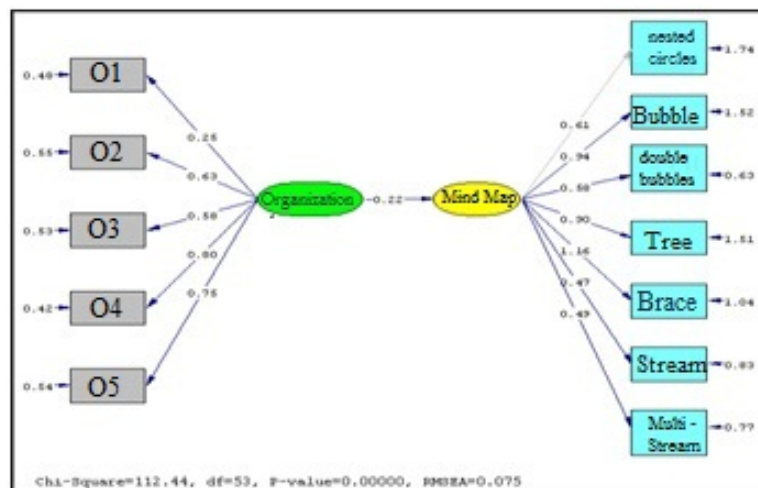

Figure 4: Chart of coefficients obtained from the computations of SEM of the sub-hypothesis 1

The general indices of measurement model fit related to sub-hypothesis 1 (Figure 4) indicate that the measurement model had a good fit. In the figure below, the value of T is given for the relationship between organizational factors of knowledge sharing and intellectual map:
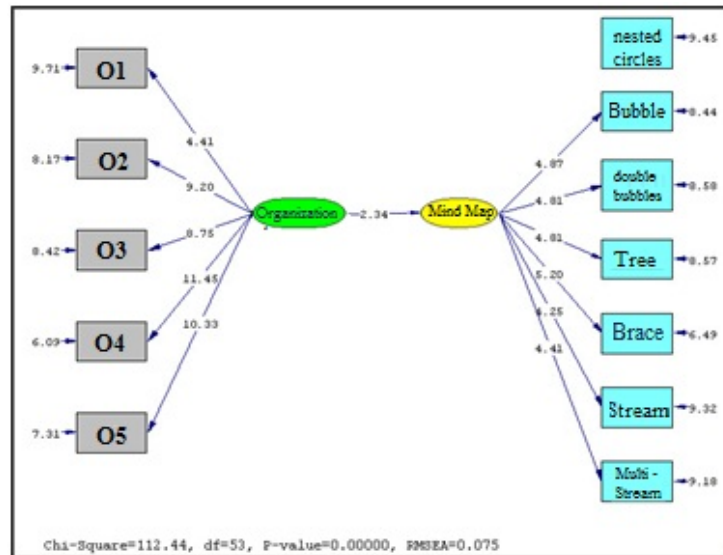
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Figure 5: Value of T for the relationship between organizational factors of knowledge sharing and intellectual map

As can be seen in the figure above, the T value in all relationships is higher than 1.96. Then, there is a significant relationship between organizational factors and mind map, and a strong relationship is established between the mind maps of each of the two variables as well.

- ***Testing sub-hypothesis 2***

Individual factors of knowledge sharing have an impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

The sub-hypothesis 2 was tested by using structural equation modeling approach. The final structural equation model of the sub-hypotheses 2 is shown in Figure 6, which represents a high impact coefficient on the relationship between the variables of "individual factors of knowledge sharing" and "employees' strategic intellectual map".
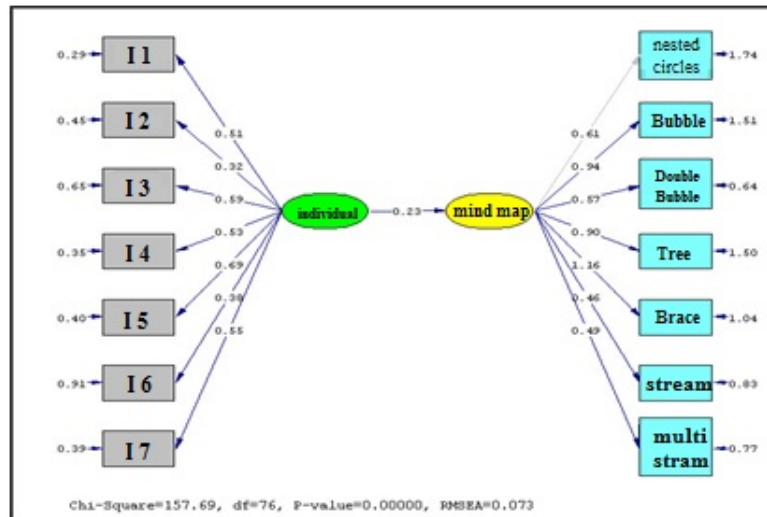
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Figure 6: Chart of coefficients obtained from the computations of SEM of the sub-

hypothesis 2

The general indices of measurement model fit related to sub-hypothesis 2 shown in the Figure above indicate that the measurement model had a good fit. In other words, these indicators confirm that the data supports the model well. The findings show that individual factors of knowledge sharing have a direct significant and positive impact on intellectual map of managers and employees in the Iran Transfo Company.
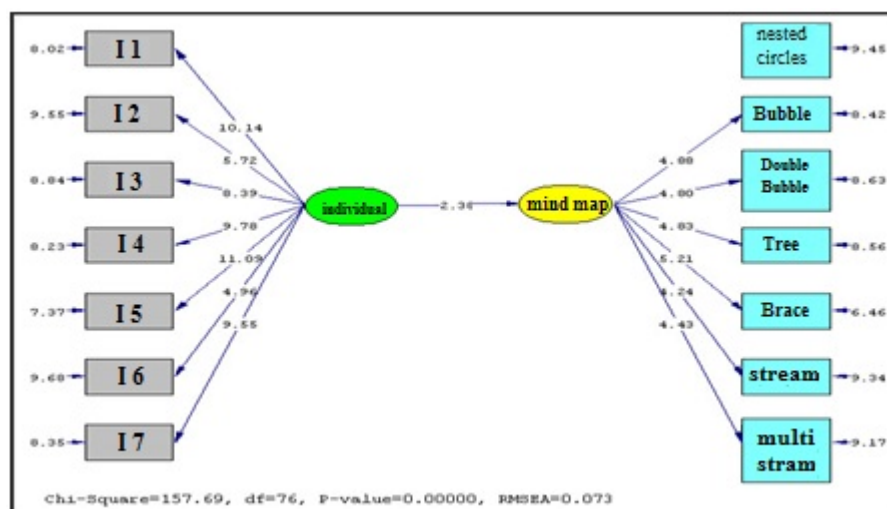

Figure 7: The value of T for the relationship between individual factors and mind map

- ***Testing sub-hypothesis 3***

Knowledge factors of knowledge sharing have an impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

H0: Knowledge factors of knowledge sharing have no impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

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H1: Knowledge factors of knowledge sharing have an impact on strategic intellectual map of managers and employees in Iran-Transfo Company.

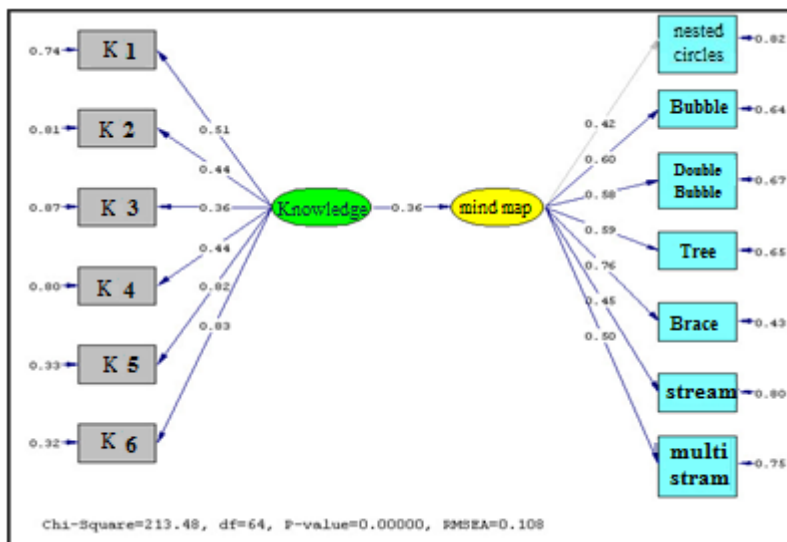The final structural equation model of the sub-hypotheses 3 is shown in Figure 8.

Figure 8: Chart of coefficients obtained from the computations of SEM of the sub-hypothesis 3

According to Figure 8, the measurement model has a good fit. The findings confirm the significant positive and direct effect of "knowledge factors of knowledge sharing" on the "mind map of employees".
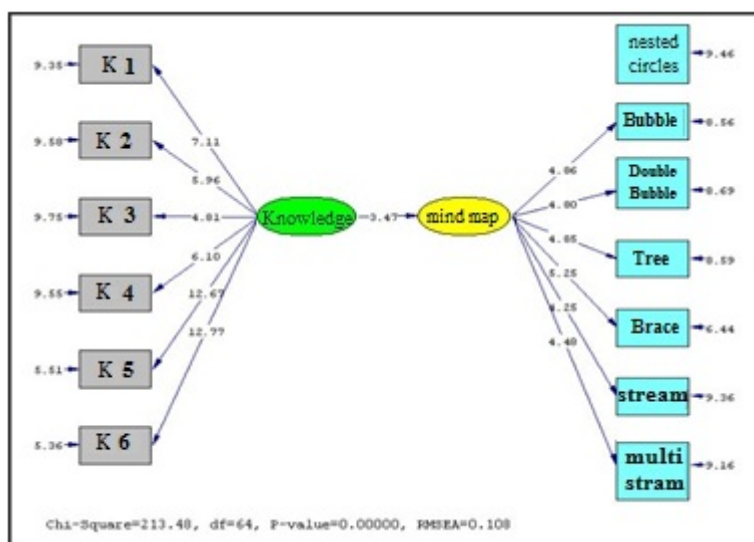

Figure 9: The T for the relationship between the knowledge factors and intellectual map

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8.   RESULTS & FINDINGS

The following results were obtained from testing the hypotheses and data analysis:

- ***Result 1: Quantity of knowledge sharing***

In the target population (Iran Transfo Complex), individuals share 60% (three of five) of their expertise. The members of the target population think they share 78% of their knowledge, information and skills with their colleagues.

Line forces (specialized and production line staff) share 60% of their knowledge (knowledge, skills, experience) with other company personnel, while the staff and support human resources (managers, bosses, administrators and staff) share 56% of their knowledge (knowledge, skills, experience) at the disposal of others.

- ***Result 2: Belief in sharing knowledge***

Two-thirds (67%) of managers and employees consider knowledge sharing as a wise and valuable measure. This means the culture of knowledge sharing has been institutionalized as 67%.

- ***Result 3: Knowledge sharing channels***

Nearly half of the sessions (48%), meetings and committees are held to share knowledge (knowledge sharing). The workforce receive 54% of the provided knowledge (information, skills, experience) and share with other people. At the request of colleagues, the personnel share by 63% "Knowing from where" or "knowing from whom" with them. In the target population, the information systems and supporting tools exist at a rate of 51% for knowledge sharing of staff in the company. In the target population, 58% of the indoor work reports and official documents of the unit and 56% of outdoor work reports and official documents the unit are shared with other members.

In 59% of the target population, there are manuals, methods and models that are shared among the members, and 56% of staff have been able to store their knowledge (knowledge, skills, experience) as printed sources and documents (article, book, printed pamphlet, ...). According to personnel in the target population,

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55% of the personnel have saved and stored their knowledge (knowledge, skills, experience) as electronic resources (CD, articles, websites, blogs, ...).

- ### *Result 4: Knowledge sharing facilities*

In the target population, 47% of sponsors support knowledge sharing. For 59% of the staff, necessary location for communication and knowledge sharing activities are available, and 55% of the target population staff have the required time for communications and knowledge sharing activities. For 52% of personnel, specific training has been provided in relation to knowledge sharing.

- ### *Result 5: Mind maps of managers and employees*

In the target population, Iran-Transfo Company, 59% of personnel think of Iran-Transfo Company as "a set of nested circles" for better understanding and analysis. If the nested circles model can be used to draw the organizational map, respectively, "management (42 items)", production "(38 items)" and "sale (15 items)" are considered in the center of the circle.

- ### *Result 6: Status and importance of Company's units in the nested mind map*

The status and positions of different units are not the same from the perspective of owners of nested circles mind maps. Three units of the Company complex have met the central circle (i.e., central role): Management (42%), Production (38%) and Sales (15%)

In the target population, 57% of personnel are convinced that if Iran Transfo can be imagined as nested circle, the importance of the units would be the same.

- ### *Result 7: Status and importance of Company's units in the bubble mind map*

For better understanding and analysis, 61% of staff consider Iran-Transfo Company as a bubble model. Three units of the Company complex have met the central circle (i.e., central role): Management (43 items), Production (41 items) and Sales (20 items). If the bubble model can be used to draw the organizational map, respectively, "management (43 items)", production "(41 items)" and "sale (20 items)" would be considered in the center of the circle.

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The status and positions of different units are not the same from the perspective of owners of bubble mind maps. In the target population, 58% of personnel are convinced that if Iran Transfo can be imagined as bubble model, the importance of the units would be the same.

- ***Result 8: Status and importance of Company's units in the doubled bubble mind map***

For better understanding and analysis, 50% of staff consider Iran-Transfo Company as a doubled bubble model. From the perspective of owners of this type of mind map, respectively, "sales and production (17 items)", "production and management (9 items)" and "sales and trade (6 items)" are two sections of the company with further central and interactive role with each other.

If the doubled bubble model can be used to draw the organizational map, respectively, "sales and production (17 items)", "production and management (9 items)" and "sales and trade (6 items)" would be parts of the company that have met the middle circles.

The status and positions of different units are not the same from the perspective of owners of doubled bubble mind maps, and the interactions between units are different from each other. Two units of the Company's complex met the central important circles are production and sales units.

- ***Result 9: Status and importance of Company's units in the tree mind map***

For better understanding and analysis, 71% of staff consider Iran-Transfo Company as a tree map. Three units of "management (58 items)", "production (26 items)" and "sales (22 items)" have met the central role of the Company complex. If the tree model can be used to draw the organizational map, respectively, "management (58 items)", "production (41 items)" and "sales (20 items)" would be considered as roots or cores. The status and positions of different units are not the same from the perspective of owners of tree mind maps. At the target population, 55% of owners of tree mind maps believe that all Company units (all branches) are equally important.

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- ***Result 10: Status and importance of Company's units in the Brace mind map***

More than half (54%) of the managers and employees believe that the company can be imagined as a Brace model for better understanding and analysis. If the Brace model can be used to draw the organizational map, respectively, "management (50 items)" and "production (29 items)" would be considered as roots or cores. The status and positions of different units are not the same from the perspective of owners of Brace mind maps. At the target population, 55% of personnel believe that all Company units (all branches) are equally important.

- ***Result 11: Status and importance of Company's units in the stream mind map***

In the target population, 60% of personnel imagine Iran-Transfo Company as a "Stream map" for better understanding and analysis. From the perspective of owners of this mind map, respectively, "sales (57 items)", production "(29 items)" and "management (12 items)" are those units of the company that are more effective in the organization success, and the future of organization depends on the activity of these units. If the units of Iran-Transfo Company can be imagined as a stream, this flow begins from the unit of "sales (57 items)", production "(29 items)" and "management (12 items) and "other items". The status and positions of different units are not the same from the perspective of owners of stream mind maps and they believe that sales unit is the most important unit to start.

- ***Result 12: Status and importance of Company's units in the multi-stream mind map***

In the target population, 55% of personnel imagine Iran-Transfo Company as a "multi-stream map" for better understanding and analysis. If Iran-Transfo Company could be imagined as a series of streams, three units of sales, manufacture and purchase" would be the most frequent units, which are in a mainstream. Also, these three units are interacting with each other.

9. Summary & Conclusion

Analysis of results and findings show that most managers and employees have not a certain and dominant mind map, but they have simultaneously several mind maps; or one can say that they confirm at least a few mind maps for analysis. From one perspective, this concept can reflect the flexibility of people; however, from the opposite view, it could mean multiplicity, plurality and confusion piles of mind maps.

In a company that all these distinct, different and sometimes conflicting mind models act at the same time in the minds of decision-makers and decision-takers, the result may lead to non-functional disruption and conflict.

The results of testing the research hypotheses showed that:

- First, knowledge sharing is not a universal process among all managers and employees.

- Secondly, the impact of knowledge sharing on each of the intellectual maps is not the same.

This means it is unclear that knowledge sharing will boost more useful and more functional intellectual maps, and it may act contradictory. Therefore, the orientation of knowledge sharing process seems to be necessary for continuous integration and improvement of mind maps of decision-makers and decision-takers.

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