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Designing a Model for strategic digital thinking competence evaluation in National Gas Company of Iran

Neda Rahimi — PhD .candidate, Department of Industrial Management, South Tehran Branch, Islamic Azad University, Tehran, Iran

Gholam Reza Hashemzadeh Khorasgani * — Associate Professor, Department of Industrial Management, South Tehran Branch, Islamic Azad University, Tehran, Iran

Kambiz Jalali Farahani — Assistant Professor, Department of Industrial Management, South Tehran Branch, Islamic Azad University, Tehran, Iran

Mahmoud Modiri — Assistant Professor, Department of Management and Accounting, South Branch Tehran, Islamic Azad University, Iran

Abstract

Purpose: With the increase of problems and the complexity of organizations, the need to provide better solutions and use more powerful tools of strategic planning is evident because managers with strategic thinking and a better understanding of the strategic plan will perform more effectively. It can be said that strategic thinking is considered as a supplement to strategic planning, a suitable approach to "leadership" of the organization and can help in systematically dealing with problems, understanding opportunities, optimal allocation of scarce resources and achieving the desired results. In view of this importance, the current research aims to design a strategic thinking competence assessment model with the approach of

* Corresponding Author: gh_hashemzadeh@azad.ac.ir

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developing organizational flexibility in National Gas Company of Iran.

Method: This research is applied in terms of purpose and was done with qualitative approach based on grounded theory method. Sampling of the research was done using snowball method (chain reference). For this purpose, qualitative data was collected, which led to the identification of many aspects of the phenomenon and the possibility of developing a conceptual research model. The data collection method is library studies, perusal of high-level documents, and in-depth and open interviews. The statistical population of this research consisted of specialists and experts in the field of management and strategic thinking, of whom 12 people were investigated .In the process of conducting this research, the interviews continued until theoretical saturation was observed.

Findings: The findings showed that six main categories are effective on the evaluation of strategic thinking with an organizational flexibility approach, which are: foresight, strategic determination, systemic attitude, innovation and creativity. The results show that the validity of the model is confirmed and the six obvious variables (six dimensions) explain the latent variables of strategic thinking competency assessment. According to the direction of all the relations between the manifest variables and the latent ones, , all the relations are aligned and direct.

Conclusion: According to the amount of standardized factor loadings, the dimension "Foresight (AN)", with a factor loading of 0.88, is the most reliable indicator belonging to evaluation measurement.

Keywords: Digital strategic thinking, Organizational flexibility, Evaluation model, National Gas Company of Iran,

Introduction

The recent century is associated with rapid and complex changes, and at the same time as the business environment becomes risky and uncertain, the timely decisions of managers are more important (Crawford and Costa, 2019). In this situation, sometimes managers, instead of rational and accurate evaluation of new information only make decisions based on their past perceptions or findings, and this entraps them into cognitive errors (Christopher et al., 2020). And this problem has caused many researchers to deal with a topic called "strategic thinking as one of the requirements for obtaining a managerial job". Strategic thinking is a continuous process that aims to resolve ambiguity and make sense of a complex environment (Hasan, Wafa, & Noor, 2016).

Therefore, the review and evaluation of strategic thinking require more attention. Considering the fact that strategic thinking as a competency has a higher importance, level and complexity in some managerial jobs than other jobs related to the field of management, despite the importance of strategic thinking competency for all managerial jobs, it is necessary that the competency factors of strategic thinking are identified so that in the next step, this important issue can be measured through the newest and most efficient evaluation method. Basically, the business environment of the past has been predictable and has slightly changed, therefore most strategic analysis models and organizational capabilities have not paid special attention to organizational flexibility. On the other hand, in traditional analytical models, the power of the organization to influence the environment has been estimated to be practically zero or very insignificant, and from this point of view, organizational flexibility to influence the environment has not been discussed. But in the highly competitive and turbulent new environment, organizations must have the ability to adapt to changes in the environment and at the same time try to be effective on the business environment in order to achieve their strategies. These requirements have caused us in recent years to pay a lot of attention to the category of organizational flexibility as well.

Most of the research was conducted on strategic thinking or on the roles of strategic thinking in strategic management (Menon and Yao, 2017). Brown's (2005) study on managerial competencies shows that the participation of different levels of managers in formulating the

organization's strategy has the potential to increase the development of strategic management. In order to face the challenges, the managers in the organization should create suitable incentives for their employees to adapt to the existing structures and develop new organizational strategies. (Staffensen et al., 2019:). The rapid pace of technological changes in today's world means that conventional management methods cannot be suitable for these new informational changes. When the changes were minor, we could use experience, but when the decisions are strategic and the results are very major and irreversible, it is impossible to make decisions based on intuitive and empirical judgments resting on philosophical assumptions involving management (Pantellis and Kennedy, 2017).

Strategic thinking is a method for solving strategic problems that is integrated with rational approaches and converges with the development of creative processes and various ideas. Having this type of thinking enables the manager to understand what factors are effective in achieving the desired goals and how these effective factors create value for the customer (Tempish et al., 2020). Strategic thinking as a core competency is a requirement for survival in today's turbulent and global environment. But despite the consensus on the significant role of strategic thinking in the realization of organizational goals, most researchers in this field have focused on explaining the nature of and factors influencing this type of thinking, and the studies that have explained the results and consequences of strategic thinking, in terms of number and macro view, have very few subjects (Biyazi et al., 2017).

Organizations must increase their flexibility to enhance future success in order to survive complex development environments (Heredia et al., 2022). The problems of organizations such as Iran's gas industry are becoming more complex day by day and their solutions require more effective solutions. Strategic planning is not necessarily an executable plan and undergoes changes over time, and in some cases, instead of solving the problem of the organization, it only relieves it, and with the loss of its effect, it leads to the creation of bigger problems. It seems that the requirement for developing and implementing a strategic plan in Iran's gas industry organizations is strategic thinking in managers who develop strategic plans (Dartaj et al., 2017).

Due to the importance of strategic thinking in today's competitive conditions, as well as evaluating the competence of strategic thinking and developing flexibility in today's turbulent organizations, the present study aims to build a model for evaluating the competence used by the organization based on the results obtained from the studies conducted in this field, and the ability of strategic thinking of leaders, managers, experts and other employees according to the approach of developing organizational flexibility in National Gas Company of Iran, which can be used to overcome existing shortcomings to ensure the establishment and implementation of strategic thinking. This research seeks to obtain new perceptions regarding the evaluation in the field of strategic thinking competency. In order to prevent the failure of the implementation or use of strategic thinking in the National Gas Company of Iran, the current research seeks to answer the following question:

What model is suitable for assessing the competence of strategic thinking with the approach of developing organizational flexibility in National Gas Company of Iran?

Research literature

The purpose of strategic thinking is to create innovative and new strategies that can rewrite the rules of the competitive game and create a potential future perspective, which is significantly different from the present (Mosleh et al., 2017). Bors Henderson, a prominent expert and the head of the Boston Consulting Group, defines strategy as a unique advantage to distinguish the organization from competitors, and considers the management of this distinction to be the basis of work. There is a strong and unchanging principle in the strategy approach, and that is (focus) (Chin et al., 2018).

Strategic thinking is a divergent and pragmatic thinking and is like dynamic thinking that is developed by continuous interaction with the environment and creativity, and in fact it is a continuous process whose purpose is to remove ambiguity and give meaning to a complex environment. . If a manager or leader wants to play a useful and effective role in the organization, he must improve his strategic thinking skills (Sultani and Malek-Mohammadi, 2016). Some have played a role in this process and are involved (Ghaffarian, 2009). The basis of strategic planning is the prediction of the future environment (opportunities and threats) and where there is a big difference between

the prediction (at the time of planning) and the reality (at the time of execution), its effectiveness is lost. Strategic planning requires a stable environment, environmental factors in balance with continuous changes, understandable and predictable action and reaction, and in the absence of such conditions, it fails to function effectively. The conditions of today's business environment are not suitable for strategic planning (Warren, Howat and Hume, 2018).

Today, it seems difficult to achieve success and assure survival of organizations, and this fact is due to the emergence of the new information age, where change is one of its main characteristics. Organizations need speed and flexibility to successfully manage change, integrate new structures and strategies, and achieve new opportunities. Rapid changes and dynamics of competitive markets have made it necessary for organizations to achieve flexibility more than ever. The high speed of digital transformation in the environment and competitive markets has created additional pressure on organizations to adapt very quickly and has led to changes at high levels. The challenge of organizations to create flexible structures and create flexibility in the current changing world is more than in the past (Hamidi et al., 2019). Therefore, the flexibility to adapt to the turbulent business environment in order to maintain a competitive advantage is one of the basic challenges of managers today (Hatom and Pettigrew, 2016).

To access the research background, databases and external sites such as Google Scholar, Emerald, Science Direct, Springer, ProQuest, etc.; Also, internal databases such as the National Library of Iran, Normagz, Mogiran, comprehensive portal of humanities, Irandoc, digital library of universities, etc., were searched. The search results showed that few studies have been done on the topic of the current research and there is an obvious research gap in the field of examining the competence of strategic thinking and the factors affecting it in the country. Some related researches are mentioned below:

Shirzad et al. (2018), in a research entitled "Neurological investigation of the brain of organizational leaders in activities related to strategic thinking: how to design cognitive tasks for study and testing with quantitative electroencephalography tools?" They concluded that the changes in alpha wave intensity in all areas of the cerebral cortex were significant compared to the changes in other waves. Significant changes in the absolute intensity of alpha waves

are comparable to the results observed in experiments related to creativity. Also, the changes in the intensity of alpha waves (12-8 Hz) in PT, TT and ST cognitive tasks were compared with each other.

In another research by Quaidamini et al. (2018), entitled "The effect of strategic leadership through strategic thinking on organizational performance in Sapco" They came to the conclusion that strategic leadership through strategic thinking has an effect on organizational performance and this effect is significant and its total effect is equal to 0.25. As a result, strategic leadership can improve organizational performance through strategic thinking.

Henry, Ghafouri and Sarkohi (2018), in their research entitled "Investigation of the effect of education through gamification on the strategic thinking of the country's sports managers", concluded that the strategic thinking of the country's sports managers depends on the type of educational method, the level of learning and motivation. They are effective. Gamification is more effective in learning strategic thinking than traditional methods. Asadpour, Saeed-Abadi and Fallah (2017), in their research entitled "Identification and ranking of strategic thinking components in Mazandaran education managers", concluded that strategic thinking has nine components including systemic thinking, strategic will, intelligent opportunism, conceptual thinking, foresight, thinking in time, advancement based on scientific approach, perspective and creativity.

In another study (1400) entitled "Investigating the role of strategic thinking in increasing companies' willingness to innovate: emphasis on strategic learning" Jalali and Mohammadi showed that the tendency to innovate in knowledge-based companies is directly affected by the level of strategic thinking and strategic learning, ,therefore, strategic learning can increase the effect of strategic thinking on the tendency to innovate. Thus, managers of knowledge-based companies can use the concepts and tools of strategic thinking and strategic learning to facilitate and encourage innovation within their organizations.

Deir (2020), in a research entitled "Designing a strategic thinking capability model using modified interpretive structural modeling and the Mi'kmaq approach" came to the conclusion that the enablers of strategic thinking are: agile thinking; divergent thinking; dynamic way of thinking; strategic vision; Smart opportunism; being active; organizational knowledge; Organization awareness and critical

thinking can be categorized in five levels and finally a model is presented.

Al-Atila, Al-Rahil and Amwali (2019), in a research entitled "Doing high-quality work, organizational performance and strategic thinking and presenting a balanced perspective" concluded that the key components of strategic thinking are: system perspective; focused goals; Smart opportunism; timely thinking; Identifying high efficiency work methods; Guiding hypotheses. Abdoh (2018) in his research entitled "The effect of strategic thinking patterns on the efficiency of decision-making processes in Jordanian insurance companies", came to the conclusion that comparative thinking is of decisive importance among the investigated components.

Khaled Abed (2018) in a study entitled "The influence of strategic thinking patterns on decision-making efficiency" shows that the decision-making process is one of the challenges that administrative organizations face and that organizations should be able to provide stability and efficiency, and in this regard, strategic thinking is one of the efficient activities. As a result of this research, the dimensions of strategic thinking are introduced as abstract thinking, diagnostic thinking, and comparative thinking. As a result of this research, abstract thinking is ranked first in terms of importance and comparative thinking is ranked last.

Maher Elatil (2018) in a research entitled "High efficiency methods, organizational performance and strategic thinking: an authentic perspective" concluded that focused goal, intelligent opportunism, due thinking and assumed analysis have a positive effect on organizational performance. Efficient high performance tasks only moderate the relationship between goal focus, intelligent opportunism, time thinking and organizational performance.

Elder Makki et al. (2022) in their research entitled "Investigation of ways to achieve strategic thinking in organizations" concluded that certain aspects of organizational excellence such as leadership, people or employees, processes and policies and resources may be given to the organization which help to achieve strategic thinking.

Methodology

The current research is descriptive-exploratory in terms of its practical purpose and in terms of data collection, and the nature of the data, it is qualitative. Accordingly, first, with the aim of collecting qualitative

data, after reviewing the literature related to the research topic, a framework for posing questions for interviews with experts was developed. The tool for measuring and collecting data in the qualitative phase of this research is a semi-structured interview. The current research community consists of experts in the field of strategic management with work experience in the National Gas Company of Iran, , using the purposeful sampling method (snowball), finally, the sample size of this research is fixed based on available experts who are willing to cooperate and while in compliance with the principle of theoretical saturation the bulk of the sample was determined to be 12 persons. The present sample in this research has more connections, dominance and qualitative and quantitative information than the rest of the society from the point of view of the goals mentioned in the statement of the problem in relation to the subject of the research. Table 1 shows the characteristics of the qualitative sample of this research.

Table 1 General characteristics of the experts interviewed in the qualitative phase

Row	Gender	Age	Education level	Frequency
1	Man	50 years	Full professor of Strategic Human Resource Management, University of Tehran	30/76
2	Man	54 years	Associate Professor of Industrial Management, University of Tehran	
3	Man	48 years	Assistant Professor of Industrial Management, University of Tehran, Operations Research	
4	Man	57 years	Assistant Professor of Industrial Management, Strategy, Islamic Azad University	
5	woman	45 years	Assistant Professor of Industrial Management, Finance, Islamic Azad University	23/1
6	Man	58 years	Associate Professor of Industrial Management, Strategy, Islamic Azad University	
7	Man	47 years	Assistant Professor of Industrial Management, Systems, Islamic Azad University	
8	Man	46 years	Member of the board of National Gas Company	30/76

Row	Gender	Age	Education level	Frequency
9	Man	49 years	Member of the board of National Gas Company	
10	Man	35 years	Member of the board of National Gas Company	
11	Man	43 years	Member of the board of National Gas Company	
12	Man	47 years	Member of the board of National Gas Company	

In the current study, to calculate the reliability using the open-test reliability method, three interviews were selected as samples from amidst the conducted interviews and each of them was recoded in a short time interval (two weeks). Then the specified codes were compared in two time intervals for each of the interviews. In each of the interviews, codes that were similar in two time intervals were identified as "agreement" and non-similar codes as "disagreement".

The total number of codes recorded by the researcher is 100, the total number of agreements between these codes is 36, and the total number of non-agreements between these codes is 9. The re-test reliability of the interviews of this research, using the proposed method, is equal to 72%. Considering that this reliability rate is more than 60%, it can be said that the reliability of the codings of this research is confirmed. The results of these codings are shown in Table No. 2:

Table No. 2. The results of the reliability check between two coders

Row	The title of the interview	Total number of data	Number of agreements	Number of disagreements	Reliability of the test (percentage)
1	First	42	16	4	0.78
2	Second	25	9	2	0.73
3	Third	33	11	3	0.69
		100	36	9	0.72

The qualitative results of the research were used to design the model through the thematic analysis of the interviews (with thematic analysis approach) to collect and categorize the answers to the qualitative questions and also to design the final model of the research. In order to achieve the research model, Strauss and Corbin's process (including causal, contextual, intervening conditions, central phenomenon,

strategies, and consequences) was employed. In order to validate the results of the interviews and confirm the components of the research model, factor analysis was used.

Research findings

In the present study, in order to analyze the data after writing the interviews, the collected data was analyzed with the help of coding. And the classification was done through three stages of open, central and selective coding. After all interviews were implemented electronically and based on the concepts included in each interview, open coding was done. In this way, a code was assigned to the interviews related to specialists and experts, and an independent number was assigned to each concept. Each code consists of a selected sentence from the main text.

The listed code is the code index, question number and interviewee number. Several common codes form a concept. In this research and in this section, a number of codes have formed the "concept" together. Common concepts form a category. Compared to concepts, categories are more abstract and show a higher level. Categories are the "scaffold" of theoretical construction and provide a tool whereby theory can be integrated. In this section, several concepts emerge and open coding ends. Axial Coding: In this stage, the main classes that are somehow extracted from open coding are connected or related to each other.

Accordingly, the communication between classes is more extensive and forms in proportion to the paradigm model. This model consists of the main phenomena of causal conditions, context, strategies, mediating conditions, and consequences. Selective coding: After determining the central class, this stage stops following the selective coding and further analyzes around a class called "central class". turned away; The class that is responsible for responding to the most changes regarding the desired phenomenon. In this research, selective coding was used to analyze existing relationships. and, each interviewee was coded from code M1 to M12. Then the initial coding was done for the interviews, separately , as it can be seen in Table 3.

Table 3. Primary coding

interview	Basic coding
M1	Systemic vision, market-based thinking, attention to the future, attention to creativity, attention to entrepreneurship, attention to the target market, attention to customers, timely decisions, attention to competitors, attention to colleagues, attention to superiors, attention to inferiors , as well as organizational components, identifying opportunities, paying attention to expansion of knowledge
M2	Holistic vision, considering opportunities, considering threats and strengths and weaknesses, paying attention to the future, paying attention to macro goals and intermediate goals and operational goals, paying attention to individual skills and abilities while paying attention to teamwork, paying attention to creativity and innovation, attention to professional ethics in the organization
M3	attention to the overview, attention to the coordination of components, attention to the vision, attention to the mission, attention to policies, attention to strategies, attention to the internal and external environment, applying new knowledge, investment in new knowledge, attention to environmental changes. , coordination with changes, having alternative scenarios, progressive thinking,
M4	Coordination with related organizations, paying attention to planning stages, planning implementation, planning evaluation
M5	Paying attention to the overall performance instead of parts, attention to the market, attention to competitive advantage, attention to innovation and entrepreneurship, attention to organizational goals, evaluate programs, attention to employees and their individual differences, attention to individual ability, planning for the future Paying attention to intra-organizational and extra-organizational communication
M6	Paying attention to past experiences, paying attention to internal organizational knowledge, paying attention to thinking and awareness, coordinating authority with responsibilities, matching results with predetermined goals, paying attention to future events, foresight and formulating scenarios for the future, paying attention to collective thinking. instead of individualism, paying attention to the whole instead of paying attention to parts, getting experts to make plans, formulating visions and strategies that are appropriate and achievable
M7	Paying attention to strengths and weaknesses, paying attention to opportunities and challenges, formulating strategies according to SWOT, paying attention to creativity and innovation, paying attention to entrepreneurs with stakeholders
M8	Attention to macro, ideal, operational, strategic, political goals, attention to the coordination of management levels, foresight and preparation for future crises, attention to client satisfaction, training and development of human resources, attention to individual and group activities, Individual responsibility, appropriateness of authority and responsibility
M9	system perspective, attention to the market, attention to changes

interview	Basic coding
	according to the world's innovations, attention to clients, attention to thinking, attention to organizational goals and moving based on the goals, attention to individual innovations, attention to expert employees, development of Up-to-date knowledge, needs assessment in developing plans, non-bias in implementing operational plans, balance between authority and responsibility
M10	Preparing for future developments and crises, formulating appropriate strategies, choosing appropriate policies with strategies, developing an evaluation and monitoring system, paying attention to similar organizations, human resource management, selection and recruitment based on abilities, paying attention to social benefits instead of Individual interests, paying attention to individual abilities, paying attention to teamwork, developing work teams, training human resources, paying attention to entrepreneurship and creativity.
M11	Paying attention to the organization's horizon and vision, paying attention to internal and external changes, having a strategy to deal with the crisis, developing thinking and knowledge, paying attention to the market, coordinating components, paying attention to synergy, paying attention to competitive advantage, monitoring performance, paying attention to Innovation, foresight, attention to the creativity of employees Attention to the dynamic environment of the organization, thinking in time, alternative strategies, flexible strategies
M12	Systemic approach, holistic approach, attention to the upper, middle and lower levels of the organization, fit between the rank and staff, foresight and preparation for the future with regard to the past and present, principled planning, moving in the direction of the organization's policy, attention to the behavior of the individual in the organization, the expansion of interactions and communications, the application of current knowledge, positive thinking , attention to policies and strategies, coordination with market changes, attention to ethics and ethical behavior,

Then open and axial coding was done and six selected codes were categorized as factors related to strategic thinking. These factors are: systematic attitude, foresight, innovation and creativity, strategic determination, intelligent opportunism and moving forward with hypotheses, which are shown in Table No. 4 of conceptual and core codes:

Table 4. Secondary coding and formation of conceptual codes and categories

category	Axial codes	Abundance	Choice codes
systemic view	Attention to systems	11	System approach
Focus on the whole instead of the parts	overview	9	
Paying attention to the complete chain of value creation and understanding the interactions between its components	Attention to the relationships of the components	10	
Paying attention to a system composed of components	Holistic	12	
Changing the attitude towards the organization as a set of unrelated components competing for resources	Changing the attitude towards components	9	
Analytical thinking	Situation analysis	10	
timely thinking	Thinking in time	8	
Market-based thinking	market orientation	7	
Conceptual thinking	Paying attention to the concept	10	
Knowledge-based thinking	knowledge orientation	11	
Understanding the dynamics of the organization's internal and external environment	flexibility	12	
foresight	Pay attention to the landscape	11	Foresight
Insightful thinking	intuitionism	10	
Thinking ahead/prudence	Future thinking	11	
Using past events to predict the future	Senarization for the future	9	
Considering the past is to move from the present to the future and improve the quality of decision making	Facing problems	9	
Visualization of the desired organizational goal and future	Formation of the future horizon	8	
Identifying the individual's role in larger systems and understanding the impact of his behavior on the outputs	team building	10	

category	Axial codes	Abundance	Choice codes
Using past knowledge to find appropriate models for making current decisions	flexibility	11	
Establishing a stable oscillation between past, present and future	Attention to the dynamics of the environment	9	
Identifying recurring patterns in events	Scenario creation	9	
Using past knowledge to find appropriate models for making current decisions	scientific movement	9	
Innovative thinking	Innovation	11	Innovation and creativity
Creative thinking	Creativity	11	
Entrepreneurship	Entrepreneurship	12	
flexibility	dynamic	11	
Syntaxism and transformation	transformationism	9	
Attention to individual and creative skills	Attention to creative staff	9	
Welcoming the ideas of employees in the organization	modernism	8	Strategic determination
Reviewing planned strategies and plan strategic options	Revision of strategies	9	
Ability to determine the value of intermediate goals compared to final goals	setting goals	7	
conceptualizing new markets (creating a new level of demand)	Attracting demand	6	
Determining valuable goals from the perspective of employees	delegation of authority	11	
Paying attention to the relationships between the strategies of the company, business unit and task with each other,	strategic Managment	12	
Interaction with the external environment and daily decision making	Strong communication	11	
Ethics	Adherence to principles	11	Smart
Vigilance towards the Vaghba industry	Paying attention to outside the organization	12	

category	Axial codes	Abundance	Choice codes
Awareness of strengths and opportunities	Paying attention to the inside of the organization	9	opportunism
Knowledge of the main areas in which the organization has problems	Attention to problems and crises	9	
Awareness of market changes	Coping with the crisis	9	Advance with hypothesis
How people face problems and provide solutions	Leadership ability	9	
Establishing a link between creative and analytical thinking	Strong interactions	9	
Creating diverse hypotheses without destroying the ability to investigate new ideas and new approaches	Creation of assumptions	11	
A positive attitude towards changes as a means to discover emerging opportunities	Thinking positive	6	
Redrafting plan	planning	3	

Then, selective coding was done in order to select the main category, systematically relate it to other categories, confirm the validity of these relationships, and complete the categories that needed further modification and development. Selective coding was based on the results of open coding. And axial coding is the main stage of theorizing. In this way, the central category is systematically related to other categories and those relationships in the framework of a narrative are presented and the categories needing further improvement and development are corrected. At this stage, the researcher according to understanding from the text of the studied phenomenon, presents the framework of the paradigmatic model of strategic thinking in the organization of Iran's National Gas Company.

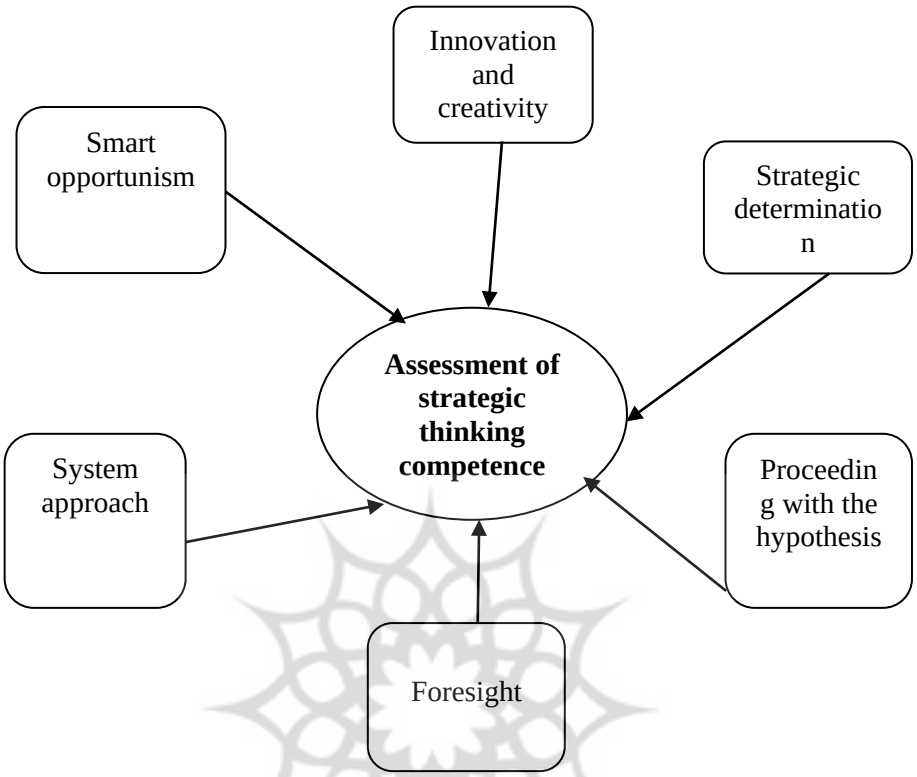

figure 1. Evaluation model of strategic thinking in the organization based on experts' opinion

The paradigmatic model for evaluating the competence of organizational strategic thinking consists of 6 main components, foresight, strategic determination, systemic attitude, innovation and creativity, moving forward with hypothesis and intelligent opportunism. Factor analysis was used to validate the model.

Validation of the model

Using Liesl software, we investigated the validity of the model components using factor load indices, t value, combined reliability and extracted average variance. Factor loads are calculated by calculating the correlation value of the indicators of a structure with that structure. If this value is equal to or greater than 0.40, it confirms that the variance between the structure and its indicators is the variance of the measurement error of that structure. more and the validity of that measurement model is acceptable. In this research, the

minimum value of the factor load was determined to be 0.40. Figure 2 shows the research model in the state of standardized coefficients or factor load.

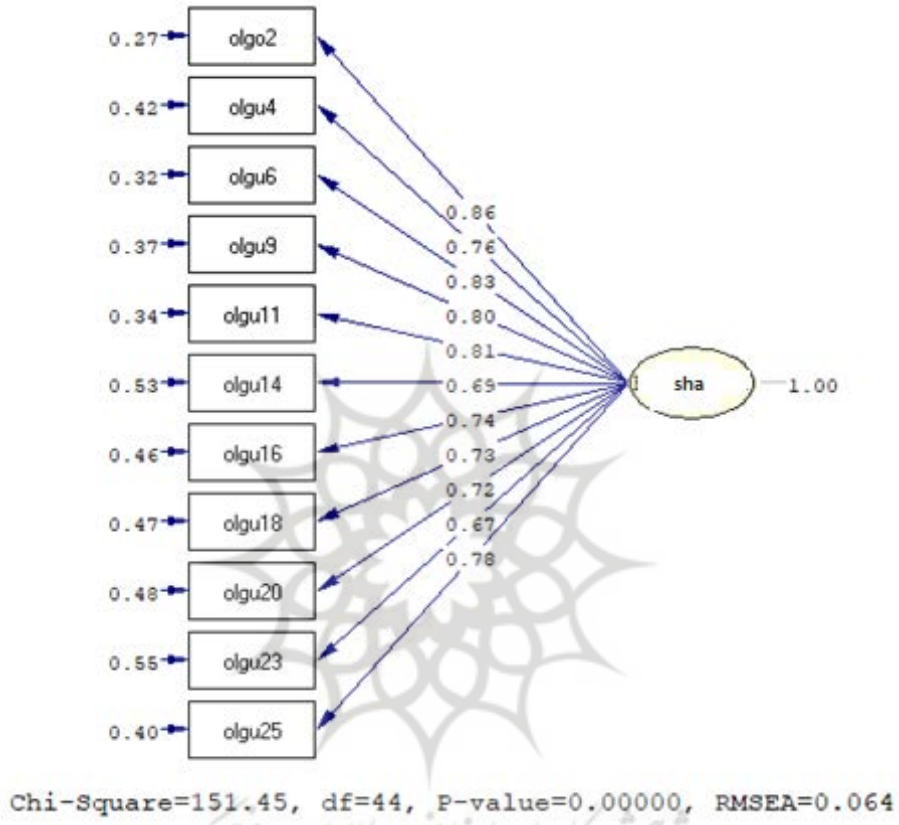

Figure 2. Measurement model), system approach in the case of standard coefficients (factor loading)

As It can be seen, all factor loadings are greater than 0.40, which means that all questions related to all components in the evaluation model have good validity.

-The component of innovation and creativity

First-order confirmatory factor analysis was used to check validity and reliability, innovation and creativity. This variable has 6 questions. Figure 3 shows the measurement model in factor load mode (standard coefficients).

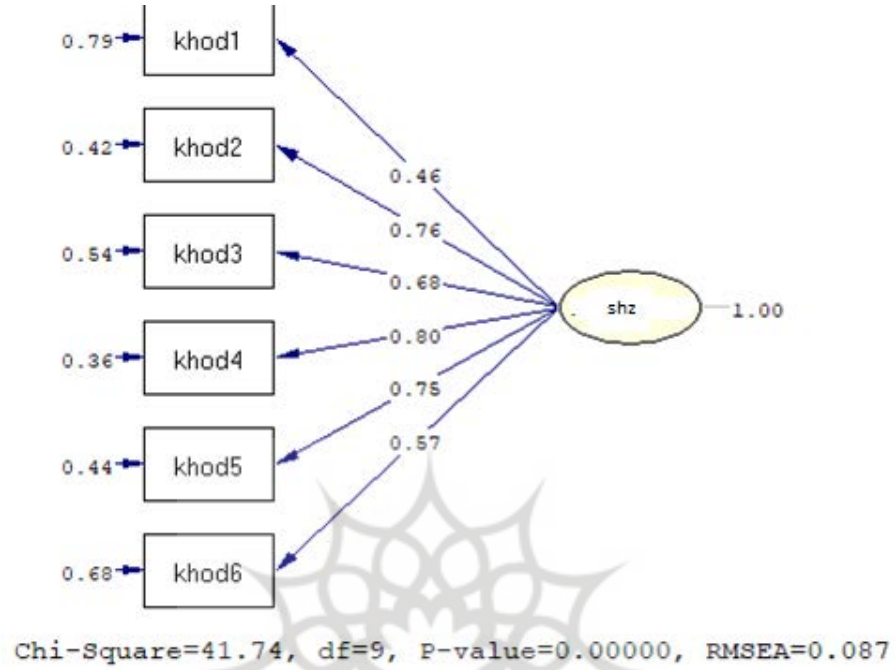

Figure 3. Innovation and creativity measurement model in the case of standard coefficients (factor loading)

As It can be seen, all the factor loadings are greater than 0.40, which means that all the questions in the innovation and creativity measurement model have good validity.

- Smart opportunism

First-order confirmatory factor analysis was used to check the validity and reliability of intelligent opportunism. This variable has 9 questions. Figure 4 shows the measurement model in the mode of factor load (standard coefficients).

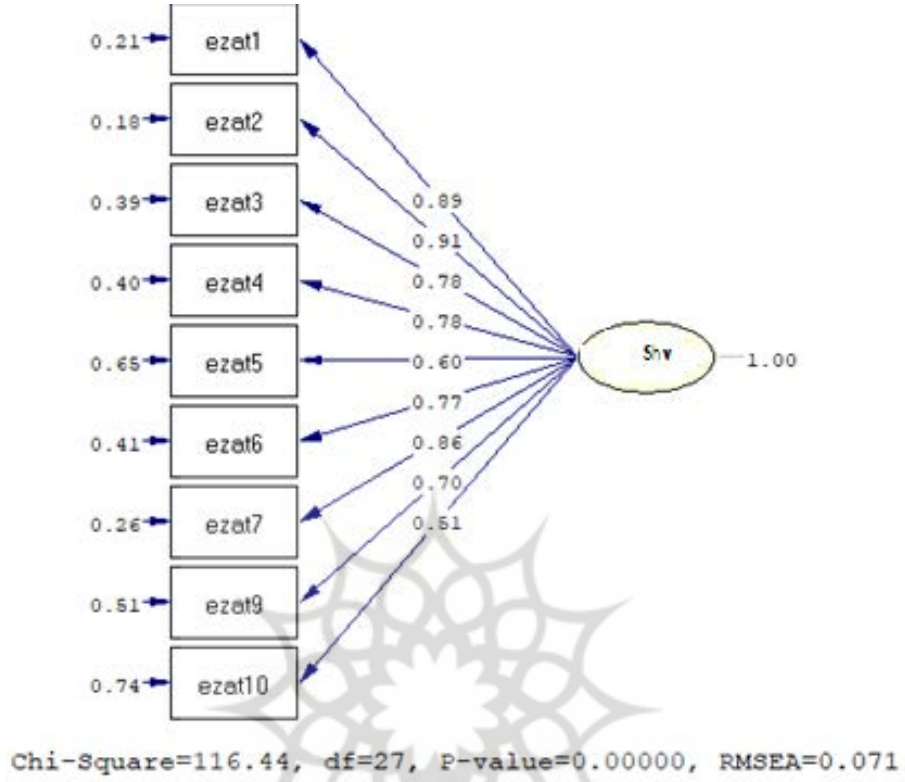

Figure 4. Smart opportunism measurement model in the case of standard coefficients (factor loading)

As It can be seen, all the factor loadings are greater than 0.40, which means that all the questions in the measurement model of intelligent opportunism have good validity.

- Strategic determination

First-order confirmatory factor analysis was used to check the validity and reliability of strategic determination. This variable has 8 questions. Figure 5 shows the measurement model in factor load mode (standard coefficients).

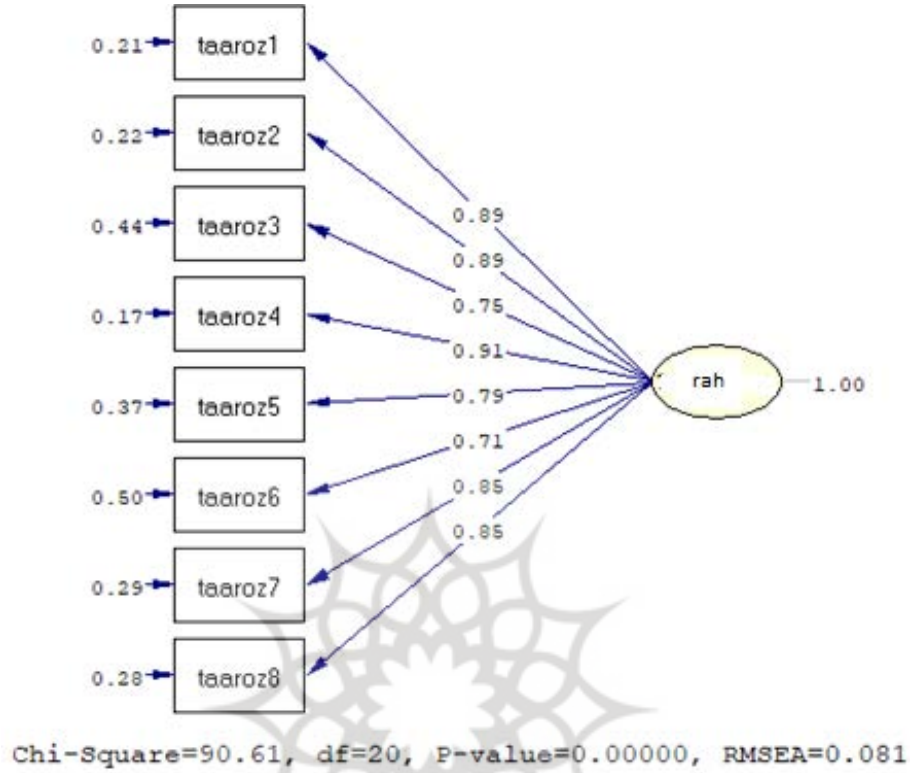

Figure 5. Strategic determination measurement model in the case of standard coefficients (factor loading)

As It can be seen, all factor loadings are greater than 0.40, which means that all questions in the strategic determination measurement model have adequate validity.

- Proceeding with the hypothesis

First-order confirmatory factor analysis was used to check the validity and reliability of the hypothesis. This variable has 10 questions. Figure 6 shows the measurement model in the mode of factor load (standard coefficients).

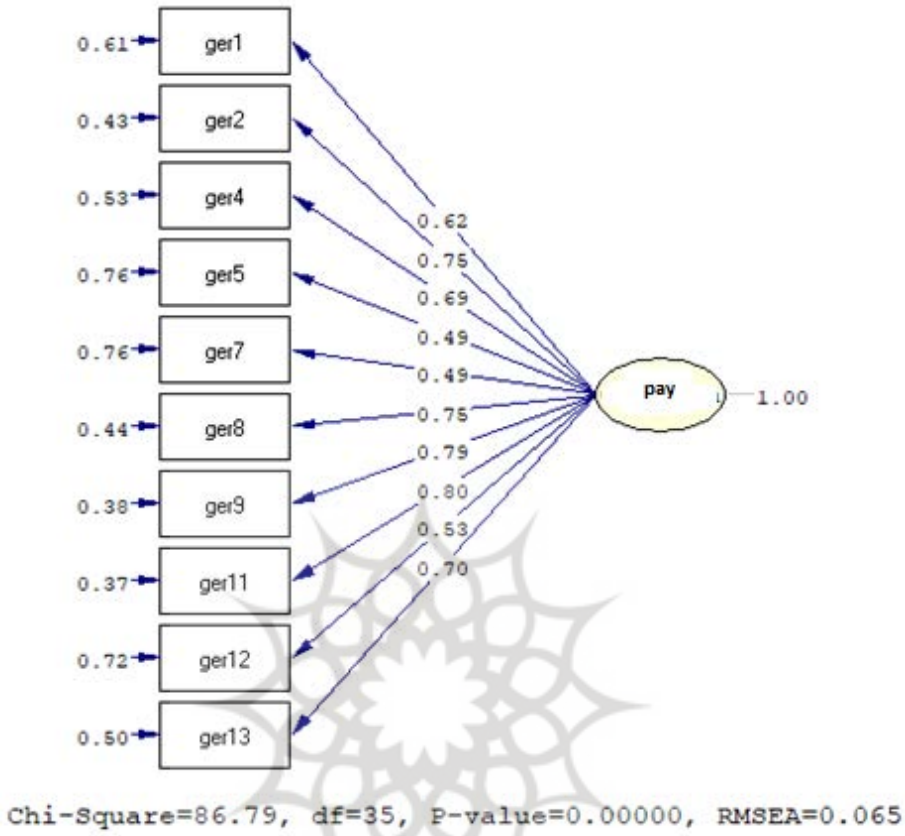

Figure 6. Forward measurement model with hypothesis in the case of standard coefficients (factor loading)

As It can be seen, all factor loadings are greater than 0.40, which means that all the questions in the measurement model based on the hypothesis have adequate validity.

Confirmatory factor analysis of strategic thinking competency evaluation model.

At first, the fit indices of the model indicated the approval of the model and according to the value of RMSEA which was 0.043 (less than 0.08), the strategic thinking competence evaluation model was confirmed based on its six dimensions and showed that these dimensions can well explain the strategic thinking competence evaluation model. Based on the estimations of the parameters of the strategic thinking competency evaluation measurement model,

considering that all the relationships between the manifest variables (evaluation dimensions) and the latent variable (thinking competency evaluation) were significant (t values above -1.96 and 1.96 +).

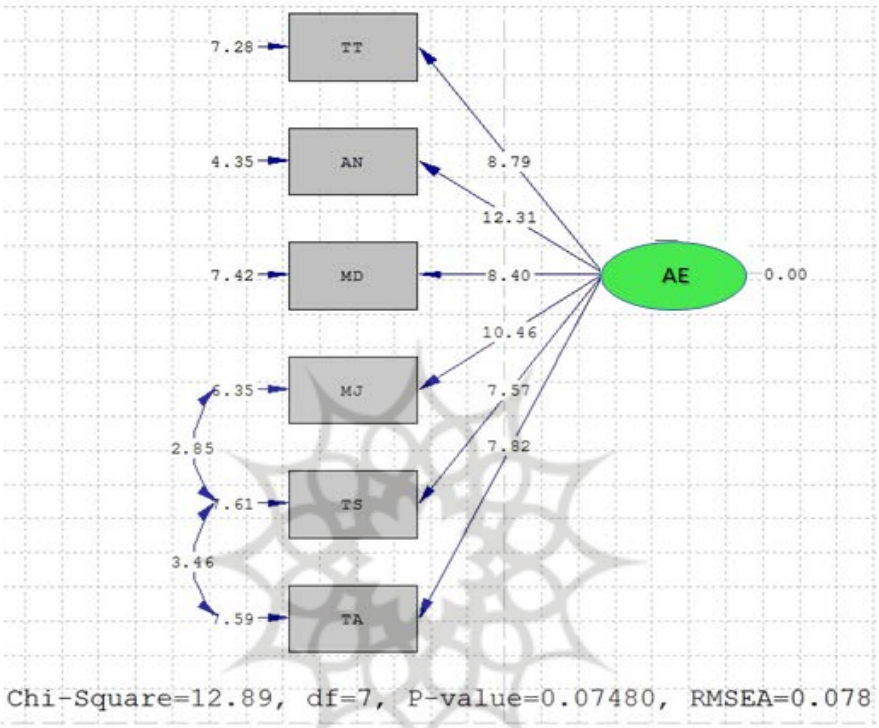

Figure 7. t-values (Figure b) of strategic thinking evaluation dimensions

The level of standard error also showed that the level of accuracy in estimating the latent variable of strategic thinking competence assessment with the approach of developing organizational flexibility by the six related obvious variables is very high and it has a small error. The findings show that according to the squared values of multiple correlation (R2), which indicates the trust or reliability of the indicators, the obvious indicators had acceptable reliability. The most reliable indicator or the highest reliability for measuring the strategic thinking evaluation variable was the "Foresight (AN)" variable, which explained 77% of the variance of the strategic thinking evaluation latent variable. The lowest reliability was related to the "strategic determination (TS)" variable, which explained 38% of the variance of the strategic thinking evaluation variable.

In addition to the reliability of the individual indicators, which was suitable, the combined reliability of the latent variable was also calculated, and considering that it was above 0.6, the reliability of the latent variable was also confirmed, and it was found that 96% of the variance of the latent variable of strategic thinking competency assessment was explained through 6 obvious variables, which is very high. Therefore, the evaluation results of the measurement part of the model provided acceptable evidence for the validity and reliability of the indicators to implement the latent variable of strategic thinking competency assessment.

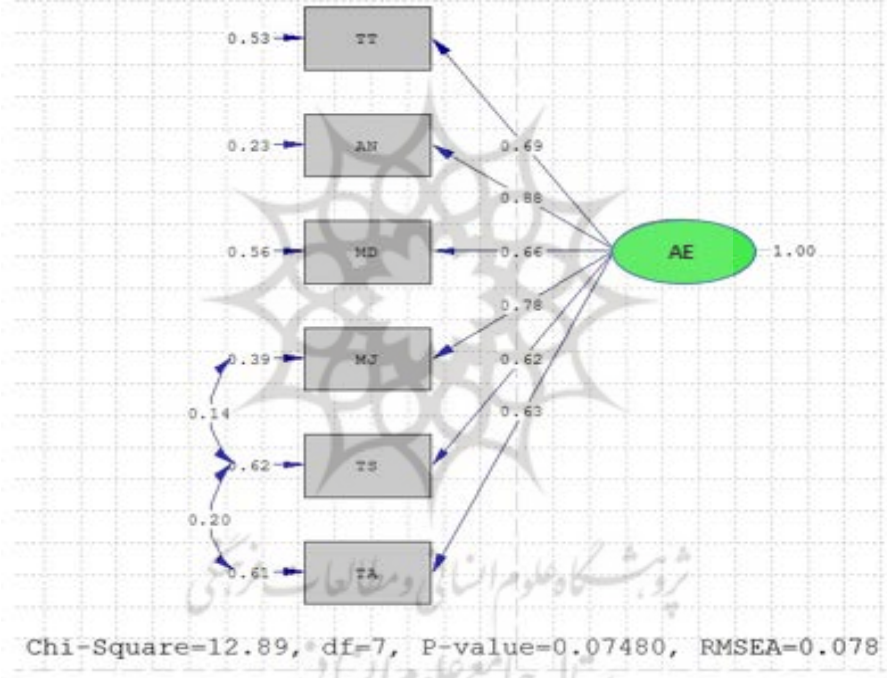

Figure 8. Values of standardized factor loadings

Examining fit indices

After estimating the parameters of the model, the question that arises is to what extent the model is compatible with the relevant data. The answer to this question is only possible by examining the fit of the model. In general, by evaluating all the fit indices (Table No. 5), it can be concluded that the obtained fit indices show an acceptable and appropriate fit of the data with the model and it is possible to fit the

model according to the index. The obtained fits were considered acceptable. Most of the fit indices in table number 5 indicate the approval of the model fit.

Table 5. Fit indices of the research model

Indicators	Acceptable value	Result	interpretation
GFI	<0.90	0.93	Acceptable fit
(fit goodness index)	(greater than 0.90)	0.070	Acceptable fit
RMSEA	>0.08	0.92	Acceptable fit
(The root of the estimated variance of the approximation error)	(smaller than 0.08)	0.91	Acceptable fit
CFI	<0.90	0.89	Medium fit
(comparative fit index)	(greater than 0.90)	0.69	Acceptable fit
NFI	<0.90	0.67	Acceptable fit
(smoothed fit index)	(greater than 0.90)	72/2	Acceptable fit

Discussion and conclusion

The present research was conducted aiming at designing a strategic thinking competency evaluation model with the approach of developing organizational flexibility in Iran's National Gas Company in 1400. The results of the findings show that six main categories are effective on the evaluation of strategic thinking with the approach of organizational flexibility. These six categories include foresight, strategic determination, systemic attitude, innovation and creativity, moving forward with a hypothesis, intelligent opportunism. Foresight is one of the most important principles of strategic management and one of the critical and vital duties of managers. Regarding the foresight component of having a long-term view (Deer and Deer, 2020); (Yasini, Abdi and Taban, 2016); (Goldman and Scott, 2016); predictive power (Sultani et al., 2014); (Yasini, Abdi and Taban, 2016); (Goldman and Scott, 2016); Drawing a strategy map (Sultani et al., 2014) (Deer and Deer, 2020); (Jamali et al., 2013) and smart opportunism (Goldman and Casey, 2010); (Deer and Deer, 2020); (Jamali et al., 2013) is mentioned.

Strategic determination was another component identified by experts, which includes the unit under the supervision of management (Deer

and Deer, 2020); (Yasini, Abdi and Taban, 2016); (Nantamanup, Karen and Ajal, 2013); internal factors (Haqvardi et al., 2014); (Nantamenop, Karen and Ajal, 2013); (Jahan Akbari et al., 2014), recognition of opportunities and threats (Sultani et al., 2014); (Deir and Deir, 2020); (Abdeh, 2018); (Jahan Akbari et al., 2014) and taking into account the opinion of experts (Ghaffarian and Kayani, 2015); (Salari Nahand et al., 2018); (Jahan Akbari et al., 2014).

Another identified component is *systemic attitude*. In the systemic approach, both general and specialized systems are considered. The public system approach to management is mainly related to formal organizations and the concepts are related to the techniques of sociology, psychology and philosophy. This component includes items such as the degree of acceptance of employees' ideas (Ghaffarian and Kayani, 2014); (Alatila, Al-Rahil and Amwali, 2019); the amount of exchange of ideas with other organizational units (Hovat and Hum, 2011); (Haqvardi et al., 2014); (Abda, 2018); the amount of encountering obstacles on the way to achieving goals (Sultani et al., 2014); (Deer and Deer, 2020); (Nantamenup, Karen and Ajal, 2013), the degree of clarity of goals and ideals (Ghaffarian and Kiani, 2014); (Alatila, Al-Rahil and Amwali, 2019); (Abdeh, 2018) and the amount of human resource utilization (Deir and Deir, 2020); (Salari Nahand et al., 2018); (Jahan Akbari et al., 2014).

The next identified component is ***innovation and creativity***, which is necessary for any strategic activity. This component includes such things as helping to develop strategic and creative thinking (Liedka, 1998); (Jahan Akbari et al., 2014); increasing creativity and innovation (Deer and Deer, 2020); (Ingrid Ben, 2005); helping to formulate and develop creative strategies (Ghaffarian and Kiani, 2014); (Jahan Akbari et al., 2014); training strategic and creative managers (Sultani et al., 2015); (Deer and Deer, 2020).

Going forward with hypothesis is also one of the effective components of organizational strategic thinking, which includes things such as the ability to design creative hypotheses (Deer and Deer, 2020); (Yasini, Abdi and Taban, 2016); (Jahan Akbari et al., 2014); Establishing a link between creative and analytical thinking (Hovat and Home, 2011); (Nantamenop, Karen and Ajal, 2013); (Jahan Akbari et al., 2014); considering alternative hypotheses (Sultani et al., 2014); (Deer and Deer, 2020); (Abda, 2018); the ability to discover ideas and provide innovative solutions (Ghaffarian and Kayani, 2014);

(Alatila, Al-Rahil and Amwali, 2019); (Nantamenop, Karen and Ajal, 2013); How people face problems and provide solutions (Hovat and Hum, 2011); (Haqvardi et al., 2014); (Nantamenop, Karen and Ajal, 2013).

Smart opportunism as the last component identified in this research also includes things such as the need to pay attention to the creation of opportunistic values (Ghaffarian and Kayani, 2014); (Salari Nahand et al., 2018); (Abda, 2018); the amount of positive attitude towards organizational changes (Sultani et al., 2014); (Deer and Deer, 2020); (Abdeh, 2018); the amount of discussion and investigation opportunities and threats (Deir and Deir, 2020); (Yasini, Abdi and Taban, 2016); (Nantamenop, Karen and Ajal, 2013); The degree of acceptance of employees' ideas (Ghaffarian and Kiani, 2014); (Alatila, Al-Rahil and Amwali, 2019) the amount of exchange of opinions with other organizational units (Hovat and Hom, 2011); (Haqvardi et al., 2014); (Abda, 2018).

In the validation of the model, the results show that the validity of the model is confirmed and the six obvious variables (six dimensions) explain the latent variable of strategic thinking competency assessment. Considering that all the relationships between manifest variables and latent variables are in the same direction, therefore, all relationships are aligned and direct. According to the amount of standardized factor loadings, the dimension "anticipation (AN)", with a factor loading of 0.88, is the most reliable indicator for measuring evaluation. In other words, the most important explanatory dimension of the evaluation in this study is the self-confidence dimension, followed by the dimensions of systemic attitude (MJ), innovation and creativity (TT), intelligent opportunism (MD), strategic determination (TA) and moving forward with Hypothesis (TS), with factor loadings of 0.78, 0.69, 0.66, 0.63, 0.62, respectively, were the most valid variables for measuring strategic thinking competence. According to the research results, it is suggested:

1. In order to evaluate the competence of strategic thinking with the approach of developing organizational flexibility, the components of foresight, strategic determination, systemic attitude, innovation and creativity, moving forward with hypothesis and intelligent opportunism should be strengthened and applied in organizations.

2.Mechanisms to increase foresight, strategic determination, systemic attitude, innovation and creativity, moving forward with hypothesis and intelligent opportunism should be foreseen in the high-middle and operational levels of the organization.

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