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Designing An Organizational Technological Entrepreneurship Model in Technological Companies Active in the Field of Oil Industry

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Abstract:

The purpose of this research is to design an organizational technological entrepreneurship model in technological companies active in the oil industry. This research is an applied research that uses mixed methods (quantitative and qualitative). The statistical community in the qualitative section consists of experts and officials of technology companies in the field of oil industry and university professors with a specialized doctorate in the number of 20 people, and with the help of the snowball method, 10 people were considered as an interview panel. And in the quantitative part, there are 5000 experts and workers of technological companies active in the field of oil industry, who were selected using a simple random method and considering the Cochran formula, 256 people were sampled. Theme analysis method was used to identify the dimensions, components and indicators, and the results of the interviews were the dimensions of capital, universities, research centers, technological entrepreneurs, infrastructures, market and customers, consultants, strategic factors, consequences, contextual factors and the government. expressed Structural equation modeling was used and confirmatory factor analysis was used to express the validity of each of the research dimensions and its tools. In the end, the scenario writing method of the conceptual model of research in the two scenarios of scenario 1 and scenario 2 was proposed for organizational technological entrepreneurship in technological companies active in the field of oil industry.

Keywords: entrepreneurship, organizational technological entrepreneurship, technological companies of the oil industry

Introduction:

The requirements of today's world have made technology one of the main factors in the establishment and management of most organizations. At the same time, extensive changes and increased competition along with the development of the use of technology strategy in organizations and the increasing importance of technological cooperation have caused managers to look for new approaches to solve organizational technological problems. This has led to the success of "technological entrepreneurship" in non-organizational fields and its undeniable role in generating wealth. Despite the fact that technological entrepreneurship is

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one of the most important factors of economic value creation and development. Technological entrepreneurship is a business leadership style that includes "identifying technological opportunities with high growth potential, collecting resources and finally managing rapid growth and risk." It becomes noticeable by using special decision-making skills. This concept is dedicated to the processes through which entrepreneurs use organizational resources and technical systems and strategies to achieve opportunities in entrepreneurial organizations. In fact, technological entrepreneurship can be considered an important strategic choice for individuals and companies to enter a new market or new business field and it can be defined as "the method and process of discovering, exploiting and exploring market opportunities for technologies". Technological companies active in the field of oil industry also have an important and sensitive role in organizational technological entrepreneurship, therefore this article tries to design a model for organizational technological entrepreneurship in technological companies active in the field of oil industry.

Definitions and concepts:

Today, creating and having an innovation process is essential for companies and organizations in an effort to achieve long-term competitiveness. Lack of an adequate level of innovation may pose a serious threat to competition. Now is the right time for entrepreneurs to play an important role in the organizational space. Derf and Byers (2005) defined technological entrepreneurship as a business leadership style that includes "identifying highly technological opportunities with high growth potential, gathering resources such as capital and expert people and finally managing its rapid growth and significant risk by applying special decision-making skills. These venture businesses offer new products and services to customers by exploiting scientific and technological advances. The leaders of these businesses are mostly not only looking for money but also have a strong desire to achieve success in these activities. Shin and Venkataraman have also considered technological entrepreneurship as a process in which entrepreneurs use organizational resources and technical systems and strategies to achieve opportunities in entrepreneurial organizations. Also, Peng and Zhang (2008) have defined the method and process of discovering, exploiting and exploring the market opportunity for technologies as technological entrepreneurship. (Bator et al., 2022)

Petty (2012) states that technological entrepreneurship refers to the process of recognizing new technologies and even creating technological opportunities with new discoveries, establishing a relationship between needs and technologies, and finally exploiting opportunities by providing products and services. Belti (2012) also considers technological entrepreneurship to be an investment in a project in which certain heterogeneous people and resources are used that are closely intertwined with scientific and technological advances to create new value for a company (Bojica). et al., 2017).

Peng et al. (2008) consider technological entrepreneurship in organizations as strategies and policies within established organizations to discover, exploit and search for technological opportunities based on the perspective of identifying and discovering entrepreneurship. Peng

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and Zhang (2008) believe that technological entrepreneurship in organizations has become an important strategy to maintain the sustainable competitive advantage of companies in today's highly competitive environment (Gazi and Cavallo, 2018).

Considering the above, it can be said that technological entrepreneurship is an activity or process that involves discovering, creating, and exploiting opportunities in order to create value by offering a new or improved product (goods or services). or a new production process in general, the organization must have an entrepreneurial culture that is consistent with organizational structures (Lee et al., 2018).

However, in general, technological entrepreneurship can be considered to include three dimensions:

Entrepreneurial dimension: a set of activities that individuals and companies perform to identify and improve the capabilities of growing technologies and business opportunities that may have been hidden from others (Olanriwajo et al., 2019).

Managerial dimension: refers to the activities carried out by individuals and organizations to develop a value that is able to capture the market quickly and possibly through a proven business plan. During this dimension, the identified opportunities are exploited (Roja, 2016).

Environmental dimension: This dimension is related to formal and informal supporting factors that create suitable conditions for technological risks. The environmental dimension includes public policies, laws and regulations, industrial standards and the granting of resources including human resources, activities and knowledge-based enterprises, public institutions, culture, communities and inter-organizational relations (Orban, 2017).

Organizational technological entrepreneurship: Based on the concept of creating new organizations based on technology, it means as follows: Technological entrepreneurship is the innovative application of scientific and technical knowledge by one person or a number of people who set up and run a business and take financial risks. They accept to achieve the vision and goals. (Younan et al., 2017).

In this type of creative work, the following dimensions can be seen clearly

A technology entrepreneur is a person who seeks to create a risky technological business whose output is the production of a new or improved product (goods or service) or a new production process (Zaho and Callier, 2017).

Science and technology park: Science and technology parks and growth centers, which are created with the aim of generating wealth, employment, and accelerating the process of economic development in countries, are considered specialized organizations in this research, which include a set of technology-oriented units. or they are knowledge-based and by providing various physical and non-physical services for the aforementioned units (such as administrative, financial, technical, laboratory, construction, consulting, networking, etc.)

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knowledge and technology between the university, industry, and market They make it flow and help to form an effective cycle for their interaction (Gosami and Datta, 20146).

Technological entrepreneurship ecosystem: It is: "Evolutionary system, knowledge, people and assets that are necessary to create a successful entrepreneurial business (Haiter et al., 2017).

Technology-based economy: Technology-based economy, which has a significant conceptual convergence with other categories such as the new economy and the knowledge-based economy, is aimed at a set of approaches and activities that commercialize new inventions and implement innovations widely in order to achieve progress and growth. The economy of countries and regions follows. Based on this, technology-oriented economic development refers to an approach in the regional economy that aims to improve and promote the environment suitable for the emergence of new innovative companies, as well as the survival and growth of existing innovative companies (Kraus et al., 2019). .

Enterprise technological entrepreneurship covers the path from technology development to commercialization. One of the existing methods to correctly identify the idea of starting a business in the field of technological entrepreneurship is to ask practical and key questions to reach basic and open-ended answers. In order to generate ideas and create a successful and sustainable business based on technology and technological entrepreneurship, a person should convert the business model based on entrepreneurial opportunity into written and practical documents using scientific models. The organizational technocratic working model shows an entrepreneur's true way of creating, delivering and capturing value. The entrepreneurial model of organizational technology makes entrepreneurs examine the key and essential parts of their business and make decisions about their future business with the necessary insight and precision (Markez et al., 2019).

Research Methodology :

The current research is based on the purpose of applied type. And in terms of the research design, it is a combined or mixed research (quantitative and qualitative) and in terms of gathering information, especially the aspects of influence in technological entrepreneurship, it is exploratory, and in terms of describing the characteristics of the studied society, it is of a descriptive-survey type. This research, by adopting the behavioral (inductive) approach and interpretive paradigm, tries to understand how the phenomenon of organizational technological entrepreneurship occurs.

Although exploratory studies are included in qualitative research, the researcher may first identify the characteristics of the phenomenon and then use quantitative research based on that. It is a part of combined research and used the design of combined exploratory methods. In this research, after studying past researches including theses, scientific articles, related books and different models of organizational technological entrepreneurship, as well as analyzing the nature and general structure of organizational technological entrepreneurship and examining

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the status of active technological companies in the field of oil companies and then through semi-structured interviews with experts and professors of the university, the components were refined and deduced, and finally, after going through the research stages and performing appropriate statistical tests (exploratory factor analysis), an initial conceptual framework of organizational technological entrepreneurship in companies Active technology should be provided in the area of the National Company of Southern Oil-rich Regions. In this research, structural equation model (multivariate analysis) and path analysis were used to check the validity of the model and the adequacy of the initial framework, the importance and prioritization of components and relationships between variables. The process of qualitative and quantitative segmentation of the research is as follows: in the qualitative part of the interview technique with university professors and specialists in this matter, and then the measurement indicators of each of the components of the framework are determined, and in the quantitative part, through a questionnaire in relation to the total Gathering information as well as fitting the model and the effect coefficients of each component were done, and in the final stage, the structural-interpretive model method was used to prioritize and determine the level of the variables (components) of the model.

Population and statistical sample

The statistical population of this research is all expert professors and experts. The statistical population in this research includes experts, including university professors and specialists, who are active in the fields and trends related to entrepreneurship, organizational technological entrepreneurship, as well as managers and policy makers. There will be industrialists in the National Company of the Southern Oil-Proof Regions of Iran, experts and related managers in technological companies (small, medium and large) active in the National Company of the Southern Oil-Proof Regions of Iran who have scientific or executive responsibility in this field. The most important selection criteria These key people are being recognized by others, having a theoretical understanding of the subject, diversity and agreeing to their own participation. and in the quantitative part it includes the companies active in the national company of the oil-rich regions of the south, they are divided into two categories:

A- Operating companies B- Service companies:

1- Karun Oil and Gas Exploitation Company 1- South Turbine Company

2-Maron Oil and Gas Exploitation Company 2-Transportation Company

3-Aghajari Oil and Gas Exploitation Company 3-Pirafari Iran Company

4- Gachsaran Oil and Gas Exploitation Company

5- Masjid Sulaiman Oil and Gas Exploitation Company

Also, the universities related to the oil industry in the oil-rich areas of the south are: 1- Ahvaz Oil Industry University 2- Abadan Oil Industry University 3- Omidiyeh Azad University

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Sample size and sample selection method from the community

Sample size in the qualitative section: For sampling in qualitative research, purposeful sampling strategies are used instead of probability sampling. In this type of sampling, the researcher tries to select people in such a way that the purpose of the research is realized. Among the qualitative sampling methods for this research, we can mention the homogeneous method (snowball) and the sample size depends on reaching theoretical saturation (16-24). Therefore, the sample size of this section is 16 to 24 experts and professors in the relevant fields of Ahvaz University of Petroleum Industry, Abadan University of Petroleum Industry, and Omidiyeh Azad University, as well as managers and industrial policy makers in the National Company of Southern Oil-rich Regions of Iran, who will be selected purposefully. became.

Sample size in the quantitative part: In this research, a possible sampling method was chosen. Because the results of these samples will be able to generalize to the entire society and have scientific value and credibility, and the statistical population in the quantitative section includes senior managers, unit managers, senior experts and experts working in technology companies (small, medium and large) is active in the National Company of South Oil-rich Regions. Since the members of the society do not have homogeneity and homogeneity, they can be divided into special sub-sections and subgroups that have intra-group homogeneity. This sampling method is called stratified random sampling. In stratified random sampling, the studied community units are grouped in classes that are more homogeneous in terms of variable attributes, so that their changes within the groups are less. After that, a number of samples are randomly selected from each class. Usually, for the classification of population units, a variable is considered as a criterion, which depends on the attribute of the variable being studied (Sarmed et al. 2013). Due to the fact that the number of the statistical population is known, Cochran's formula is used to calculate the sample size. .

To determine the sample size, Cochran's formula was used and the sample size was calculated considering the confidence level of 95% (α=0.05). The value of z or t in Cochran's formula was considered as 1.96 with a confidence level of 95%. The value of d (permissible error) is considered to be 0.2 or 0.20 or less so that the power of the test is not less than 80%, where the value of d (0.05) was considered. The values of p and q were considered to be 0.5 in order to calculate the maximum sample size. The statistical sample of employees was calculated using Cochran's formula as follows. And the statistical population is equal to 5000 people

Data collection and analysis methods

Library resources: studying documents and documents in libraries (physical space) and scientific sites available on the Internet (virtual space) which includes searching in specialized books, theses, scientific and specialized articles, reference databases, databases and and digital libraries. It was used in order to gain a deep insight into the research topic and the literature and research background. The search begins by determining the keywords to find literature and

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research history. This is done by using specialized libraries and websites and using first-hand and second-hand sources. Of course, the researcher emphasizes the use of first-hand sources, which include literature reported by people who have conducted the research themselves or who have proposed the main ideas for the first time. However, he used second-hand sources that have references to the literature that summarized the first-hand source, to scrutinize the research topic and determine the scope and range of information in the research field. Finally, using this method, to collect information about the foundation Topics such as the general basics of research, definition of concepts and key and operational words, importance and necessity of research were used.

Field studies (questionnaires, interviews, photos, etc.) include observations, interviews, and questionnaires. The data collection tool in the qualitative stage was based on the knowledge extracted from the theoretical literature and was obtained from semi-structured interviews. The data collection tool required for the quantitative part of the research is provided by designing, distributing and collecting a questionnaire, which was prepared and implemented using a Likert scale.

Qualitative Research Interview: Qualitative researcher believes that nothing provides the researcher with correct information like an interview in which there is some kind of free relationship. In fact, establishing a relationship is a part of the research process, not a part of it. Here, the interviewee is considered a participant in the research, in the qualitative part, the researcher seeks a deep understanding of the views of a certain group or people. Based on the theoretical literature of the research, the primary components of organizational technological entrepreneurship have been extracted, but it is necessary to To evaluate the effectiveness of organizational technological entrepreneurship in active technological companies in the area of the national company of the southern oil-rich regions according to experts.

Questionnaire of exploratory factor analysis and structural equations: this discussion is placed in the quantitative part of the research, here the researcher based on the indicators of the organizational technological entrepreneurship model of active technology companies obtained through interviews to group and identify the components of the model and determine the intensity of the relationship Among them, he uses exploratory factor analysis and structural equations. For this purpose, a questionnaire is prepared and after measuring its validity and reliability, it is sent to the research sample and the data in question is collected for exploratory factor analysis and structural equations.

Model Validation Questionnaire: We design a qualitative questionnaire that includes the indicators, components, type and intensity of the relationship of the final model. We sent the above questionnaire to (15-20) experts to collect data. Then we designed another questionnaire to implement the model, and the evaluation of these two questionnaires confirmed the validity of the model.

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In this research, content validity and face validity have been used for instrument validity. For this purpose, from the beginning, we carefully tried to use acceptable and appropriate indicators and components in library studies and using international reference models as well as similar researches. It should be mentioned that after the initial design of the questionnaire by sending them to experts And obtaining the approval of indicators and components in each process for those cases where more than 70% of people agreed, content validity and face validity were confirmed. The questions that had little validity were removed or modified from the questionnaires. In general, there was more than 90% agreement for most of the indicators. For more confidence in the questions. Construct validity was also used. With its capabilities, Lisrel software can investigate the validity of questionnaire questions through confirmatory factor analysis. This was done through structural factor analysis and confirmatory factor analysis.

Reliability is one of the technical features of the collection tool.

In order to maintain the reliability of the research, the following items were taken into consideration:

- The interview method was used for a specific issue or problem.

- Respondents with expertise related to entrepreneurship were selected. The desired specializations of the respondents are covering the various areas of the mentioned category at the level of the National Company of the Southern Oil-rich Regions.

- In the end, an effort was made to create a level of consensus.

To calculate the reliability of the measurement tool, various methods are used, such as retest reliability, parallel reliability, internal consistency of measures, reliability of consistency between questions (Cronbach's alpha coefficient) and reliability of halving questions.

For all indicators of technological entrepreneurship, according to the relevant dimension, Cronbach's alpha coefficient was calculated using Spss statistical software. If the Cronbach's alpha coefficient is higher than 0.7, it indicates the agreement or correlation of the respondents in this case that the collection tool (questionnaire) has high stability and reliability.

Also, to calculate the reliability of the conducted interviews, the test-retest reliability method and intra-subject agreement method were used. To calculate retest reliability, three interviews were selected and each of them was coded twice in a 15-day interval by the researcher. The total number of agreements between codes in this time interval is equal to 180, the total number of agreements between codes in two times is equal to 165, and the total number of non-agreements in these two times is equal to 50. The retest reliability of the interviews conducted in this research is 0.76, and since this rate is more than 0.60, it is acceptable.

In order to calculate the reliability of the interview with the within-subject agreement method of two coders, a research colleague was asked to participate in this part. After the necessary training on coding techniques, three interviews were coded simultaneously by the researcher

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and the coder's colleague. The inter-coder reliability for the interviews conducted in this research was calculated as 0.80. The reliability of the coding is confirmed and it can be claimed that the reliability of the interviews is appropriate.

Qualitative interviews:

The text of the interviews was carefully implemented and used for analysis along with the notes taken. To analyze the text of the interviews, the theme analysis method is widely used in qualitative research. In this method, the interview is first implemented from the audio recording of the interview session and completed using the notes taken during the interview sessions. Then, by carefully studying these texts, firstly, for each of the prepared interviews, all the independent ideals in the form of concepts (such as the development of technological entrepreneurship rules for the purpose of the entrepreneurial process) and sub-themes (each of the dimensions) are identified, and then to each Which code was assigned? The following tables are the concepts identified in the texts of the interviews, which are categorized in the form of sub-themes. By doing these sub-themes, a more general classification was made, which led to the identification of the main themes (the key components of organizational technological entrepreneurship in technological companies active in the field of Iran's oil industry).

Table 1 - Concepts and examples of themes identified in the text of interview No. A

The title of the sub-theme	Theme subcode	The title of the identified concept and its associated quote	Concept code
Fund	Sub-theme 1	The meaning of capital in this research is capital in the general sense. Capital in the general sense is the financial resources that are provided through banks, technology development funds, investment companies, both governmental and non-governmental, such as pension funds, and other entrepreneurial networks, including relatives, friends, and acquaintances of entrepreneurs, and real persons. It is used to start, grow, and develop a business.	Concept 17
Universities and research centers	Sub-theme 2	Education - research and development and technology transfer - science and technology parks and growth center.	Concept 15
Tech entrepreneur	Sub-theme 3	Skills - characteristics - motivations	Concept 18

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Table 2- Concepts and examples of themes identified in the text of interview number 2

The title of the sub-theme	Theme subcode	The title of the identified concept and it associated quot	Concept code
Infrastructure	Sub-theme 1	Software infrastructure - hardwar infrastructur	Concept 17
Market and customers	Sub-theme 2	Complete competition in the market uniqueness of the product - interaction wit competitors - adoption of superficial strategie	Concept 15

Table 3- Concepts and examples of themes identified in the text of interview #3

The title of the sub-theme	Theme subcode	The title of the identified concept and its associated quote	Concept code
Consultants	Sub-theme 1	Information gap - Learning gap - Technical capabilities gap - Resource access gap - Consultants within the entrepreneur network	Concept 17
Strategic factors	Sub-theme 2	Discovering and creating technological opportunities - evaluating and exploiting opportunities	Concept 15

Table 4 - Concepts and examples of themes identified in the text of interview #4

The title of the sub-theme	Theme subcode	The title of the identified concept and its associated quote	Concept code
Consequences	Sub-theme 1	Better services - smoother services - fast services - cheap services - better information - people's satisfaction	Concept 17
Background factors	Sub-theme 2	Individual factors - culture - structure - rules and regulations	Concept 15

Table 5 - Concepts and examples of themes identified in the text of interview number 5

The title of the sub-theme	Theme subcode	The title of the identified concept an its associated quot	Concept code
Government	Sub-theme 1	Stimulating the supply o entrepreneurship - stimulating th demand of entrepreneurshi	Concept 17

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Data analysis in this study was possible using the expert method. The expert method is the most common form of interview analysis to generate meanings. Using this method, first coding and classification of existing textual units into meaningful and logical categories (themes) and considering the three characteristics of inclusion, mutual exclusion and independence are done. became. The main theme and sub-themes (conceptual categories) extracted based on the discussed topic were presented.

Table 7-Table of expert areas of interviewees and experts (interview group)

Number of interviewees	Place of employment	Expertise and executive field of interviewees
5 people	Hehai University of Khuzestan Province	Education Management
5 people	Islamic Azad University, Ahvaz Branch, Industrial Management Training Center, Payam Noor University, Shahid Chamran University, Ahvaz	Government management, executive, educational, commercial
5 people	5 people	Managers and experts
15 people	**Total**	

The summary of theme analysis findings can be shown in the table below.

Table 8- Number of sub-theme questions

Number of questions	**Sub-themes**	Main themes	**Theme code**
6	Better service	consequences	**11**
	Smoother service		
	Fast service		
	Cheap service		
	Better information		

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	People's satisfaction		
2	Experienced consultants	Consultants	12
	Academic advisors		
2	Contract with research institutes	Universities and research centers	13
	Connection with science and technology parks		
4	The sovereign role of the government	Government	14
	the budget		
	International sanctions		
	The role of council policy making		
	vigilance	Background factors	15
	risk taking		
	Innovation		
11	Futurology		
	wish for success		
	teamwork spirit		
	Acceptance of change		
	flexibility		
	Renovability		
	No resource limitations		
	Intellectual property protection		
2	Research and development teams to evaluate opportunities	Strategic factors	16
	Carrying out the project at the experimental level for evaluation and exploitation		
4	Information Technology	Substructures	17
	the tribunes		

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	Research and development facilities		
	Transportation		
4	Perfect competition in the market	Market and customers	18
	The uniqueness of the product		
	Interaction with competitors		
	Surface strategies		
8	leadership	Technological entrepreneur	19
	learning		
	Create a network		
	team work		
	Internal control center		
	Relative success		
	Job dissatisfaction		
	risk taking		
4	Risk capital	Fund	
	Bank loans		
	Government aid		
	Financing through the entrepreneurial network		

At the inferential level of the research, two approaches have been used. In the first approach, first the table related to the weighted averages of the goals is presented, and then the status of the averages obtained for each of the goals is matched with a three-level spectrum and it is placed in one of them according to the value. .

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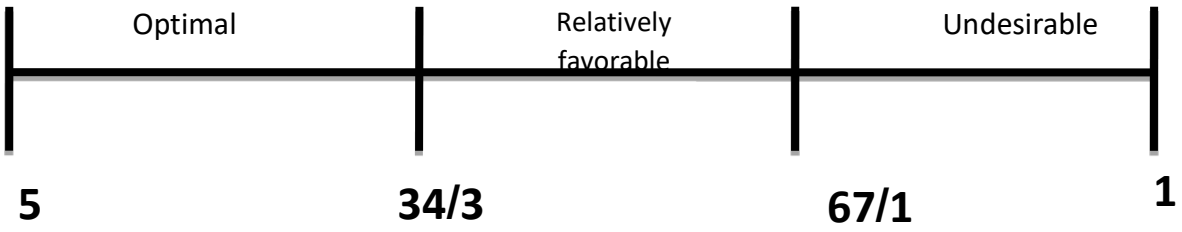

research findings :

First question: What is the organizational technological entrepreneurship model in technological companies active in Iran's oil industry?

In response to this question, it should be acknowledged that the most important thing that a manager should do regarding the technological entrepreneurship of his human resources is to empower his human resources and human capital. . Therefore, most of the organizations, including the National Company of Southern Oil-rich Regions, have realized the importance of this issue. It has empowered these people according to the current conditions and competitive conditions. Hence, the technical entrepreneurship is considered as follows:

a) capital b) universities research centers c) technological entrepreneurs d) infrastructures f) market and customers

g) Consultants h) Strategic factors i) Consequences j) Background factors k) Government

According to the above and by examining the semi-structured interviews, the technological entrepreneur model can be divided into the following:

A) Consequences include things such as: smoother services, fast services, cheap services, better information, people's satisfaction

b) Consultants: experienced consultants - academic consultants

c) Universities and research centers: contract with research institutes - connection with science and technology parks

d) The government - the sovereign role of the government - the budget - international sanctions - the policy-making role of the council

e) background factors: vigilance-risk-taking-innovation-future research-success-seeking-teamwork spirit-acceptance of change-flexibility-renovation ability-no limitation of resources

Intellectual property protection

f) Strategic factors: research and development teams to evaluate opportunities - conducting projects at the experimental level for evaluation and exploitation

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g) infrastructures: information technology - tribunes - research and development facilities - transportation

Surface strategies - technological entrepreneur - leadership - learning - network creation

Team work - internal control center - relative success - job dissatisfaction - risk taking

The classification of the components into seven factors was obtained according to the exploratory factor analysis method. According to the output of the exploratory component analysis and the obtained results, the concepts measured in the items have a clear alignment and correlation, which is explained below.

Interpretation of factors:

The first component: the aligned items include smoother services-faster services-cheaper services-better information-people's satisfaction, which are identified in terms of consequences, which were set based on theoretical foundations and are gathered in the form of consequences, and In total, it explains 25.84 percent of the changes in organizational technological entrepreneurship factors in technological companies active in the field of oil industry.

The second component: based on the theoretical basis, there were items for evaluating consultants, including experienced consultants and academic consultants, all of which were identified with high correlation in the form of one component and covered 39.506% of organizational technological entrepreneurship changes in technological companies active in The field of oil industry is reliable.

The third component: The third component covers 52.420% of the changes in universities and research centers so that it can be measured by combining the concepts of user situation and use. The components include contracts with research institutes and connections with science and technology parks.

The fourth component: the items with the approach of measuring government factors were designed based on theoretical foundations, which are explained by covering 62.085% of changes in government factors in the form of one component. These components include the governance role of the government-budget-sanctions between International - the council's policy-making role.

The fifth component: items in line with vigilance, risk-taking, innovation, future research, success-seeking, teamwork spirit, acceptance of change, flexibility, ability to innovate, lack of resources, support of intellectual property, which are related to the background factors of the case. They identify that it was set based on theoretical foundations and accumulates in the form of contextual factors and explains 65.337% of organizational technological entrepreneurship changes in technological companies active in the field of oil industry.

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The sixth component: the aligned items include research and development teams to evaluate the opportunities to carry out the project at the experimental level for evaluation and exploitation, which are identified regarding the strategic factors that were set based on theoretical foundations and gathered in the form of strategic factors come and explains 66.574% of organizational technological entrepreneurship changes in technological companies active in the field of oil industry.

The seventh component: the aligned items include information technology, tribunes, places of research and development, transportation, which are identified in terms of infrastructures, which were set based on theoretical foundations and are gathered in the form of infrastructures. And in total, it explains 67.754 percent of organizational technological entrepreneurship changes in technological companies active in the field of oil industry.

The 8th component: The related items include leadership, learning, creating a network, teamwork, internal control center, relative perfectionism, risk-taking, and job dissatisfaction, which are identified in the case of technical entrepreneurs, which were set based on theoretical foundations. and they accumulate in the form of technological entrepreneurs, and in total, it explains 68.337 percent of organizational technological entrepreneurship changes in technological companies active in the field of oil industry.

Ninth component: The aligned items include surface strategies, uniqueness of the product, interaction with competitors, the presence of complete competition in the market, which are identified in terms of the market and customers, which were set based on theoretical foundations and in the form of the market and Customers gather and it explains 1.210 percent of organizational technological entrepreneurship changes in technological companies active in the field of oil industry.

The 10th component: The items in line include venture capital, financing through the entrepreneurial network, government aid and bank loans, which are identified in terms of capital, which were set based on theoretical principles and accumulate in the form of capital and in It explains a total of 70.565 percent of organizational technological entrepreneurship changes in technological companies active in the field of oil industry.

Also, for all the dimensions used in the factor analysis model, a confirmation was made, which is the example of the confirmatory factor analysis of one of the dimensions (capital).

In order to determine the validity of capital variable, confirmatory factor analysis method was used. Factor loadings are reported in Figure 5-4 and T-coefficients are reported in Figure 4-1. The numbers on the paths are factor loads. All factor loadings are between -1.96 and +1.96. which expresses convergent validity. Therefore, factor loadings are acceptable. For example, the factor loading of the first question of the capital variable is equal to 0.76. In other words, the first question explains approximately 76% of the variance of the capital variable. The value of 0.43 is also the error value (variance value that cannot be explained by the first variable, it

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is clear that the lower the error value, the higher the determination coefficients and the greater the correlation between the question and the relevant factor. The numerical determination coefficient value is between 0 and 1 is that the closer it is to 1, the more the explanation of the variance increases.

Figure 1 - Lisrel output result for capital variable in standard estimation mode.

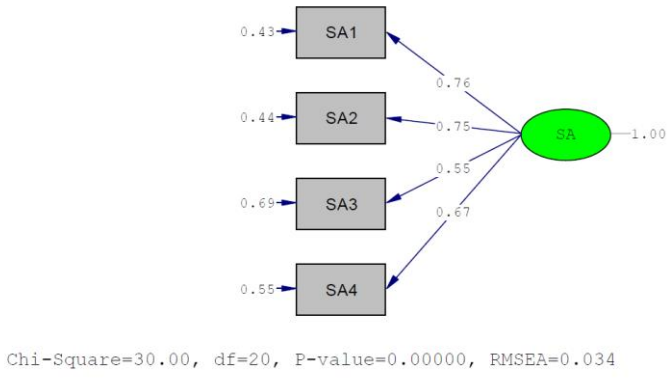
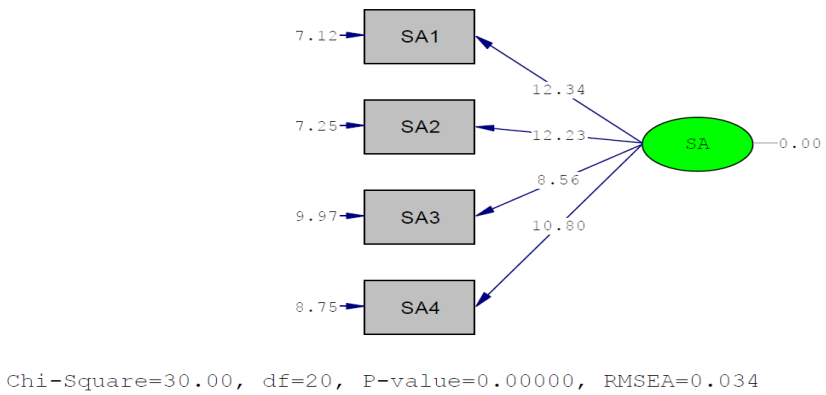


Figure 2- The result of Lisrel's output for the capital variable in a significant state



According to Lisrel's output, the calculated value of df/2x is 1.5, the presence of df/2x smaller than 3 indicates the appropriate fit of the model, and the root mean square error estimate (RMSEA) should be less than 0.08, which is in the model Presented, this value is equal to 0.034. The amount of GFI, AGFI, CFI and NFI indicators should be more than 0.9, which is higher than the determined amount in the model under investigation. Therefore, the data of this

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research has a good fit with the factor structure of this scale and it indicates the alignment of the questions with the capital variable.

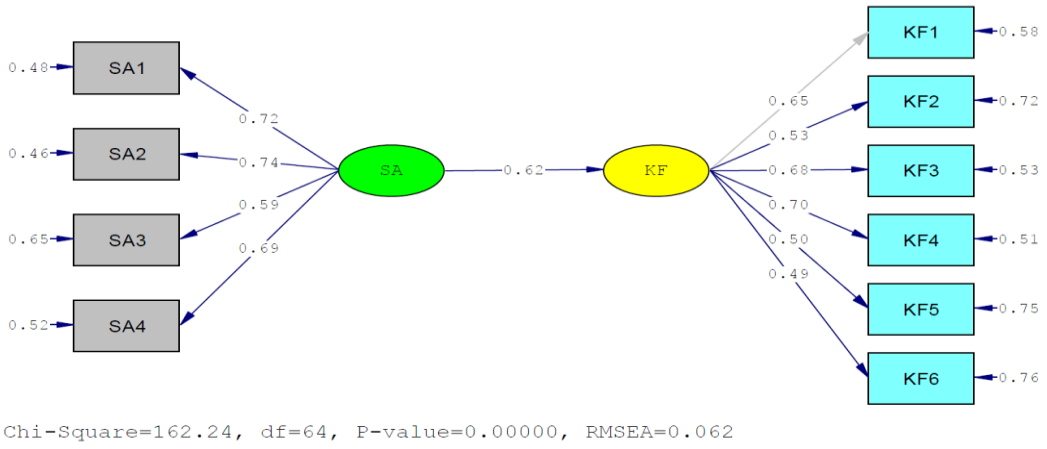
Table of capital scale fit indices

Criterion	estimate	characteristic
$\chi 2/df < 3$	1/5	Chi-square ratio to degrees of freedom (□2/df)
RMSEA<0/08	0/034	root mean square error estimate (RMSEA)
GFI>0/9	0/99	goodness of fit index (GFI)
AGFI>0/9	0/98	Adjusted Goodness of Fit Index (AGFI)
CFI>0/9	1	Comparative Fit Index (CFI)
NFI>0/9	0/99	Softened Fit Index (NFI)

Since we needed structural equations to draw the model, first we examined the effect of each of the discovered dimensions, for this purpose we formulated hypotheses and after distributing the relevant questionnaire in the statistical community, we analyzed it, and the following results were obtained.

Hypothesis 1: Capital has a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

The shape of the research model in standard estimation mode



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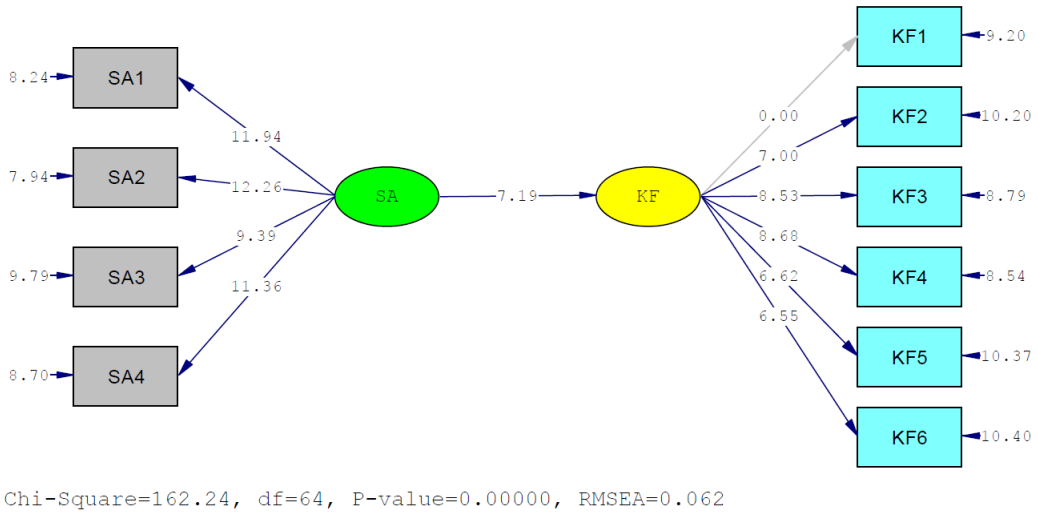
The shape of the research model in the case of significant numbers



H0: Capital does not have a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

H1: Capital has a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

According to the structural equation obtained in the figures above, the null hypothesis has been rejected at a significance level of 0.05, as a result, the researcher's claim has been confirmed with 0.95 confidence, and with an error rate of 5%, it can be said that: capital on entrepreneurship Organizational technology has a positive and significant effect in technological companies active in the field of oil industry. The path between the variables is 0.62, its significance is 7.19 (confirmation of the hypothesis).

Also, in other hypotheses, the following results were obtained.

Hypothesis 2: Universities and research centers have a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

Hypothesis 3: Infrastructure has a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

Figure 16-4 Research model in the case of significant numbers

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H0: Infrastructures do not have a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

H1: Infrastructure has a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

According to the structural equation obtained in Figure 4-15 and 4-16 and at a significance level of 0.05, the null hypothesis has been rejected, as a result, the researcher's claim has been confirmed with 0.95 confidence, and with an error rate of 5%, it can be said that : Infrastructure has a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry. The path level is 0.47 and its significance level is 5.69. (confirmation of the hypothesis)

Hypothesis 4: The market and customers have a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

Hypothesis 5: Consultants have a positive and significant effect on organizational technological innovation in technological companies active in the field of oil industry.

Hypothesis 6: Strategic factors have a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

Hypothesis 7: The results have a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

Hypothesis 8: background factors have a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

Hypothesis 9: The government has a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

Hypothesis 10: The technological entrepreneur has a positive and significant effect on organizational technological entrepreneurship in technological companies active in the field of oil industry.

The final research model:

After explaining the dimensions, indicators of the final model of technological entrepreneurship and selecting the best indicators, they can be shown in the form of a single model, so that a clear and accurate picture of the model can be obtained. This model has dimensions and indicators. These selected indicators can help us in answering the research questions mentioned in the problem statement section. These questions refer to the main dimensions of technological entrepreneurship.

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As it can be seen from the findings of the research, the main dimensions have been approved for the organizational technological entrepreneurship model in technological companies active in the field of Iranian oil industry.

The scientific goal of this research was to provide a suitable model for the organizational technological entrepreneurship model in technological companies active in Iran's oil industry. In this model, by determining the dimensions and related indicators, the oil industrial units were converted into productive units.

The first scenario: the model of organizational technological entrepreneurship in technological companies active in the field of Iran's oil industry is as follows.

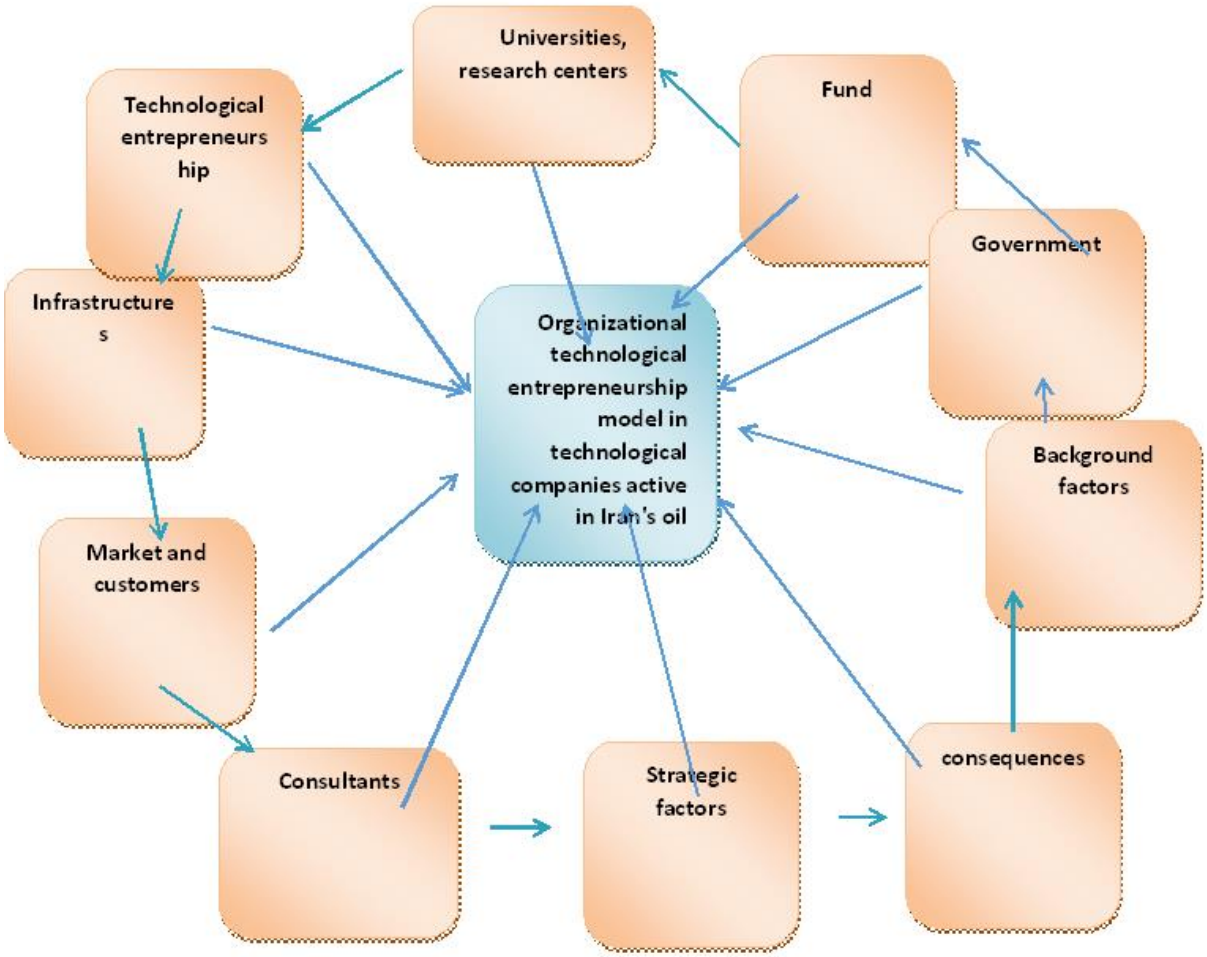

Figure: Organizational technological entrepreneurship model in technological companies active in Iran's oil industry

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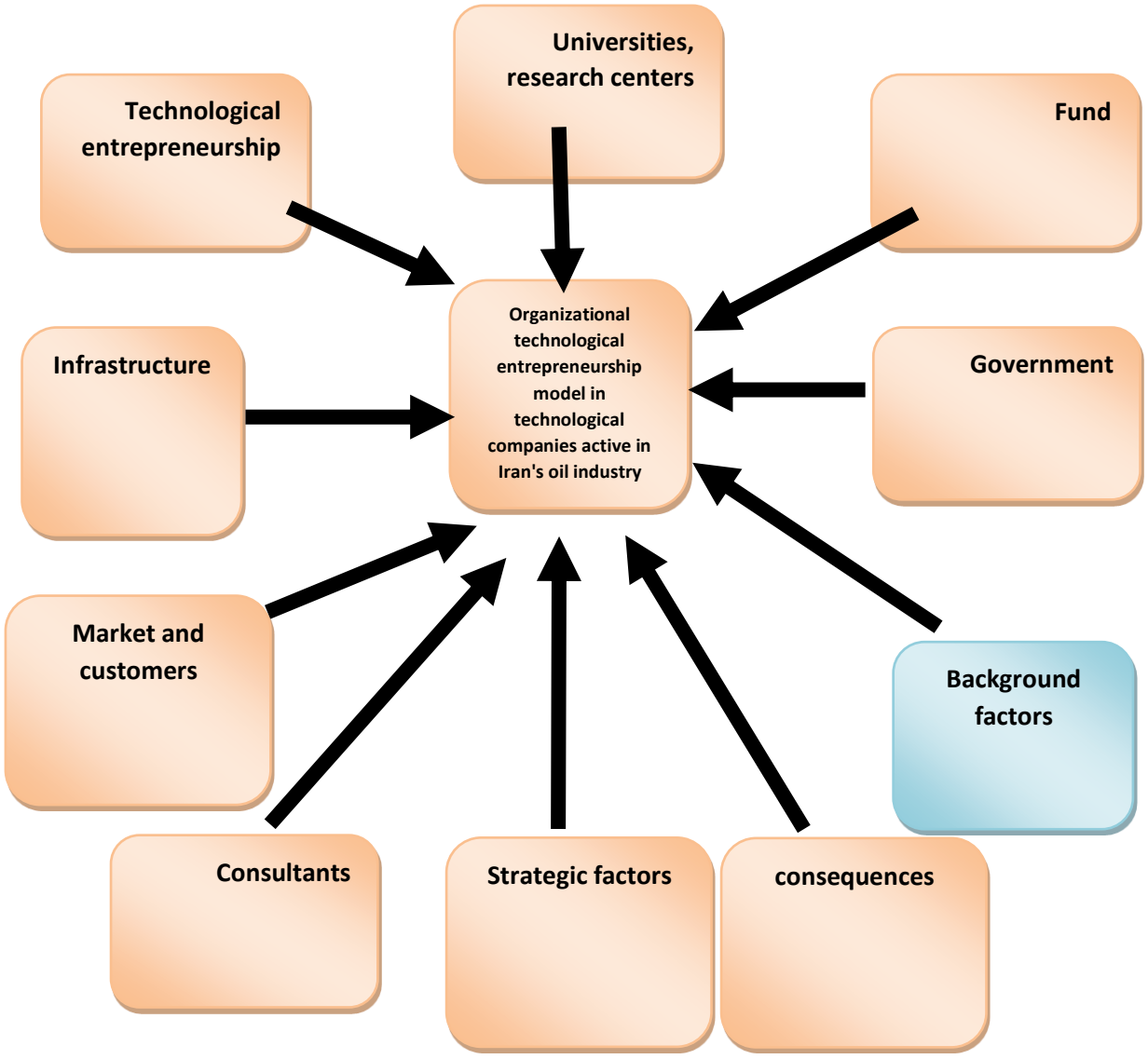
The second scenario: the organizational technological entrepreneurship model in technological companies active in Iran's oil industry is as follows.

And also the conceptual model of the research is expressed as follows:



suggestions

As a first step, it is suggested that technological companies active in Iran's oil industry develop and use technological entrepreneurship strategies in various fields. Therefore, a strong link should be established between the model of technological innovation and human resources.

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Because the goal of solving the problems of technological companies active in Iran's oil industry is to combine, arrange and organize internal and external knowledge and match it with changes in the internal and external environment, which causes innovation, invention and development in this company.

1. Establishment of the model in companies and other related companies with the support and assistance of top management and relevant officials.

2. Training people and culture the importance of technological entrepreneurship model and process agility among employees

3. Removing the existing weaknesses in the field of technological entrepreneurship and strengthening the organizational strengths during a specific schedule.

4. Determining the responsibility of each of the organizations and individuals involved in the technological entrepreneurship model

5. Designing a suitable incentive and punishment system for establishing the model

6. The present study was formed in order to present a technological entrepreneurship model in technological companies active in the Iranian oil industry. The present study showed that it is possible to create a model to help managers in developing existing strategies by using the models and activities of other countries using the Delphi method. The final developed model shows the strategies and technological entrepreneurship in the form of a model. The suggestions that are more detailed from the present research are as follows:

- It is suggested that in another separate research, the mode of interaction and relationship of the considered indicators should be investigated and the appropriate platforms for the implementation of the model should be established.

- It is suggested to consider the support and participation of the top management based on a systematic approach in model development programs.

- Organizational culture and emphasis on the promotion of management, emphasis on the seniority of people's wealth of knowledge, the service history of people should be taken into account.

- People's desire and motivation, people's talent and defined capacities for people's roles in technological innovation programs should be reviewed and reviewed.

- The feeling of job insecurity, dishonesty of information, cost perspective, unnecessary administrative procedures, attitudes based on jealousy, weakness of the program process, weak evaluation tools, lack of identification of future needs from the organizational programs of human resources managers, and the attitudes are changed to positive attitudes and be stable

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- Things like change management, marketing process management, successor selection in marketing, successor development, criteria and key positions in entrepreneurship, structural factors of entrepreneurship management, organizational culture factors, retention and maintenance of entrepreneurial talents; It should be established by giving training classes among the employees.

- Development and path of career advancement, payments and rewards, entrepreneurship management, training and development and process improvement.

- Leadership, strategic, specialized, interactive, individual, and customer-oriented factors should be taken into consideration in managers' plans.

- Special attention should be paid to social, organizational, and technological aspects.

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