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Presenting a model for the competitiveness of selected Iranian knowledge-based companies in the Fourth Industrial Revolution

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Abstract

This research aimed to present a model for the competitiveness of selected Iranian knowledge-based companies in the fourth industrial revolution. Therefore, in terms of the goal, it is applied research because, in addition to the awareness and scientific aspect, it will also have a practical element for the relevant organizations. According to the purpose and nature of this research, in terms of method, it was qualitative research conducted by interviewing research experts. The statistical population of the study included Iran's knowledge-based companies, which, according to the classification of the working group for evaluating and recognizing the competence of knowledge-based companies and institutions, the field of electricity and electronics, laser and photonics, were chosen due to their greater dependence on the components of the fourth industrial revolution. The approach of the qualitative part has been grounded in theory. The results showed that the competitiveness model of selected Iranian knowledge-based companies in the fourth industrial revolution includes internal organizational factors, Extra-organizational factors, agility, capable intellectual resources, value chain, innovative services and products, environmental factors, organizational factors, international drivers of the fourth industrial revolution, data challenges in the implementation of technology 04, governance factors in the fourth industrial revolution, industry's relationship with University, increasing information literacy, continuous research and development, identification of technological advantage, capability building, laws appropriate to the characteristics of the fourth industrial revolution, attention to the environment, attention to the market and the needs created by the fourth industrial revolution, determining strategy, investment in technology, survival, and value creation.

Keywords: competitiveness, knowledge-based companies, the fourth industrial revolution
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1 Introduction

Competitiveness is one of the critical issues emphasized in the management and strategic marketing literature in recent years. In this regard, different perspectives on determining and practical factors have been presented, where the theorists of the industrial organization consider environmental factors as the dominant and determining factors of competitiveness. The first person among these theorists was Bain, who expressed his theory in [6]. However, the famous theorist of this group is Michael Porter. According to Porter's model, the central unit of analysis is the industry. In this regard, he believes that companies' profitability depends on the industry's attractiveness and the

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company's relative position in the industry. According to this model, if the strategy makes the organization perform activities that are different and distinct from the competitors, then the core competencies facilitate the possibility of choosing variety and differentiation and cause the organization to gain a competitive advantage. Among other theories of this group, we can mention the theory of Amit and Schoemaker [3]. According to these two, the company's profitability depends on the compatibility of strategic assets and strategic factors of the industry. Therefore the basis of competitiveness is based on the interaction of industrial organization and the theory of competence [14].

Competitiveness has different meanings at the company or country level [12]. United Nations Industrial Development Organization (UNIDO) [20] defines competitiveness at the level of economic enterprise as the ability of enterprises to compete to sell their products in domestic or global markets. The most important result of competitiveness is increased competition in more production, which leads to the development of the country's industrial sector and economic growth. It also leads to the advancement of technology and the increase of economic, social, and environmental benefits. Therefore, competitiveness should be considered in the strategies and policies related to increasing the public welfare of a country [20].

On the other hand, knowledge-based companies are the heart and driving factor of the knowledge-based economy. Even though the term small and medium companies have had a special place in the management and economic literature of the world for many years due to their unique functions, however, the term knowledge-based or technology-oriented companies are relatively new, so many countries have not yet provided a clear definition of it [15]. Some researchers have called knowledge-based institutions that use their knowledge assets as the primary source of competitive advantage. In another research, the characteristics of knowledge-based institutions have been summarized in this way: "The ratio of experts and specialists to the total number of employees in these institutions is high. Technological changes in these institutions are more than in traditional industries. More research and development has been done in these institutions, and their growth and development depend more on technology development. In addition, their competitive advantage is mainly technological innovation; finally, these companies conquer new markets quickly" [9].

Now the question is, what components and factors are involved and vital for the competitiveness of knowledge-based companies in the present era when the fourth industrial revolution has occurred? To answer this question, this study aims to provide a model for the competitiveness of selected Iranian knowledge-based companies in the fourth industrial revolution.

2 Research methodology

According to the purpose and nature of this research, in terms of method, it was a qualitative research that was conducted by interviewing research experts. The approach of the qualitative part has been grounded theory. The intended statistical population was experts familiar with the research topic, including university professors familiar with the competitiveness of companies, senior managers of knowledge-based companies in the selected field (electrical and electronic hardware, telecommunications, laser and photonics) and evaluation agents of knowledge-based companies. In this section, sampling was done theoretically. In theoretical sampling, events are sampled, not necessarily people. If people are also referred to, the main and key goal is to explore events. Theoretical saturation was achieved by conducting about 30 interviews. For more certainty, the interview continued with 9 more people, and by ensuring complete saturation, the research samples reached the number of 39 people.

Sampling was done purposefully in the framework of the logic of the qualitative method. Two methods of targeted and snowball sampling were used in the sampling. Usually, in qualitative research, purpose-based sampling is typically used to obtain the most information, so the researcher chose participants who were "rich in information." That means, based on the principle of qualitative research, samples were selected that presented a robust picture of the phenomenon under study. The participants were selected based on the purposeful sampling method of senior managers and experts in the field of study at the university who were also willing to be interviewed. Due to the widespread of the covid19 disease and according to the restrictions and compliance with the principles of health protection, it has been tried to use other methods of conducting interviews such as audio files, email, and WhatsApp. The basis of the work of the qualitative part of the study was the ground theory method (foundation data theory) and three types of open, central, and selective coding, which was done with MAXQDA software. Grounded data theory (also known as data-driven, contextual, and grounded theory) is a general, inductive, and interpretative research method developed in 1967 by Barney Glazerwanselm Strauss.

One of the used group knowledge acquisition methods is the fuzzy Delphi technique, a structured process for predicting and helping to make decisions during survey rounds, gathering information, and finally, group consensus. In this technique, a questionnaire including the extracted criteria is sent to each expert group member separately

and confidentially. Then the members are asked to assign a score from 1 to 10 to each criterion. The questionnaires will be collected in the second step, and the criteria whose average opinion score is less than 7 will be removed. The remaining criteria are sent in the form of a new questionnaire. These steps continue until reaching a set of criteria that have obtained scores above seven. There is a difference of opinion about the composition and size of the Delphi technique panel. The usual recommendation is to use a mix of people with multiple specialties, and heterogeneous groups are better than homogeneous groups. In this study, a combination of experts with various specialties has been used. Hogarth [10] believes that six to 14 members are ideal for the Delphi technique, and according to Clayton [8], between 5 and 10 members are sufficient if a combination of experts with different specialties is used. Triangular fuzzy numbers will be used to fuzzify the experts' point of view. The opinion of experts about the importance of each index has been compiled with a 7-degree fuzzy spectrum.

Table 1: The spectrum of seven fuzzy degrees for the evaluation of indicators

Linguistic variable	**Fuzzy value**	**Fuzzy number scale**
Absolutely unimportant	$\tilde{1}$	(0, 0, 0.1)
very unimportant	$\tilde{2}$	(0, 0.1, 0.3)
unimportant	$\tilde{3}$	(0.1, 0.3, 0.5)
medium	$\tilde{4}$	(0.3, 0.5, 0.75)
Important	$\tilde{5}$	(0.5, 0.75, 0.9)
very important	$\tilde{6}$	(0.75, 0.9, 1)
Absolutely important	$\tilde{7}$	(0.9, 1, 1)

In the next step, the opinion of the experts should be gathered. Various methods have been proposed to aggregate the views of n respondents. These aggregation methods are experimental methods presented by different researchers. The fuzzy average strategy is used in this study.

Equation (2.1): Calculation of average triangular fuzzy numbers

$$F_{AVE} = \left(\left\{ \frac{\sum l}{n} \right\}, \left\{ \frac{\sum m}{n} \right\}, \left\{ \frac{\sum u}{n} \right\} \right) \tag{2.1}$$

It is usually possible to sum up the average of triangular and trapezoidal fuzzy numbers by a definite value of the corresponding best average. This operation is called de-fuzzification. There are several methods for defuzzification. In this study, the surface center method presented as follows:

Equation (2.2): Defuzzification of fuzzy triangular numbers

$$DF_{ij} = \frac{[(u_{ij} - l_{ij}) + (m_{ij} - l_{ij})]}{3} + l_{ij} \tag{2.2}$$

The de-fuzzified value greater than 0.7 is accepted, and any index with a score lower than 0.7 is rejected.

The value of this scale is equal to one when there is complete coordination or agreement, and it is equal to zero when there is a complete lack of coordination. "Schmidt" provides two statistical criteria for deciding whether to stop or continue the Delphi rounds. The first criterion is a strong consensus among the panel members, which is determined based on the value of Kendall's coordination coefficient.

The technique for order preferences by similarity to an ideal solution (TOPSIS)

The steps to perform the TOPSIS method are as follows:

The set of selection options is $A = \{A_i | i = 1, 2, ..., n\}$, and the set of criteria as $C = \{C_j | j = 1, 2, ..., m\}$ are defined.

The set $X = \{X_{ij} | i = 1, 2, ..., n : j = 1, 2, ..., m\}$ including performance rate and $W = \{W_j | j = 1, 2, ..., m\}$

The zone is a set of criteria. The information table is defined as $I = (A, C, X, W)$ in Table 2.

The first step in TOPSIS is to calculate the normalized rates by equation (2.3).

$$r_{ij}(x) = \frac{x_{ij}}{\sqrt{\sum_{k=1}^{n} x_{ij}^2}}, \quad i = 1, ..., n, \quad j = 1, ..., m. \tag{2.3}$$

Then the weighted normalized rates are calculated by equation (2.4).

$$h_{ij}(x) = w_j r_{ij}(x), \quad I = 1, ..., n; \quad j = 1, ..., m \tag{2.4}$$

Table 2: Information on the TOPSIS method

Options \ Criteria	C_1	C_2	$\cdots$	C_m
A_1	X_{11}	X_{12}	$\cdots$	X_{1m}
A_2	X_{21}	X_{22}	$\cdots$	X_{2m}
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
A_n	X_{n1}	X_{n2}	$\cdots$	X_{nm}
W	W_1	W_2	$\cdots$	W_m

In the following, positive and negative ideal solutions were identified. The positive ideal solution (A^+) is the best performance score of all options regarding a criterion and is calculated by equation (2.5). On the contrary, the negative ideal solution (A^-) is the worst performance score of all alternatives on a criterion calculated by equation (2.6).

$$AJ^+ = \{(\max h_{ij}(x)|j \in J), (\min h_{ij}(x)|j \in J), \quad i = 1, 2, ..., n\} \tag{2.5}$$

$$AJ^- = \{(\min h_{ij}(x)|j \in J), (\max h_{ij}(x)|j \in J), \quad i = 1, 2, ..., n\} \tag{2.6}$$

In the next step, after determining the positive and negative ideal solutions, the distance of each option from the positive and negative ideal solutions is determined by Equation (2.7) and Equation (2.8) as follows:

$$Di^+ = \sqrt{\left(\sum_{j=1}^{m}(h_{ij} - h_{j^+})\right)^2}, \qquad i = 1, 2, ..., n \tag{2.7}$$

$$Di^- = \sqrt{\left(\sum_{j=1}^{m}(h_{ij} - h_{j^-})\right)^2}, \qquad i = 1, 2, ..., n \tag{2.8}$$

where Di^+ and Di^-, respectively, represent the distance between the performance score of the options concerning all criteria and all positive and negative criteria.

The R_i value is the final performance score in the TOPSIS method and is in the interval [0,1] for all i. The selected option has the highest value of performance points.

3 Research results

- Identification of research indicators (open coding)

  In the following, by presenting the coding tables of interviews and articles, we present the competitiveness model of knowledge-based companies in the fourth industrial revolution.

- Axial coding

  Axial coding is the second stage of analysis in foundational data theorizing. This stage aims to establish the relationship between the classes produced in the open coding stage. The relationship of other classes with the central class can be realized in six topics: causal conditions, central phenomenon, strategies, and actions, intervening conditions, contextual conditions, and consequences [19]. Before considering these six classes and their relationship with each other, with the opinion of professors and experts, the main and subcategories were determined from all the indicators obtained.

- Categories of background conditions

  Based on the results of the secondary coding of the research, indicators of environmental and organizational factors were selected as background categories in presenting the competitiveness model of knowledge-based companies in the fourth industrial revolution.

- Categories of causal conditions

  Based on the secondary coding results of the research, indicators of internal and external factors were selected as categories of causal conditions in presenting the competitiveness model of knowledge-based companies in the fourth industrial revolution.

Table 3: Primary (open) coding extracted from the articles

Open coding	**Frequency**	**Open coding**	**Frequency**
Effective management of human resources	40.0	Software and hardware technologies	1.0
Utilizing the capacities of human resources	20.0	Internet	2.0
Education	7.0	hygiene	1.0
Control	4.0	education	3.0
Consciousness	13.0	Electricity supply	1.0
Internal supervision	4.0	Transportation	1.0
Monitoring the external environment	2.0	Telecommunication networks	1.0
Support from top managers	4.0	Business environment	6.0
Managerial decision making	4.0	Company culture	4.0
Total Quality Management	11.0	Innovative culture and entrepreneurship	3.0
Competitive Intelligence	3.0	Access to resources	1.0
Foreign intelligence	1.0	Resource limitations	4.0
Internal intelligence	1.0	Information Resources	3.0
Business model	1.0	human resources	3.0
Organization size	8.0	Knowledge cycle	1.0
External factors	77.0	Technological resources	1.0
Shortening the product life cycle	1.0	the budget	15.0
Technologies of the fourth industrial revolution	72.0	Funds	7.0
Digitization	18.0	Communication skills in the fourth industrial revolution	12.0
Technology level of the country	1.0	Social Networks	7.0
Access to the latest technologies	1.0	Organizational preparation for the fourth industrial revolution	20.0
Industry dynamics	3.0	International drivers of the fourth industrial revolution	20.0
Value Chain	25.0	International communication	8.0
supply chain	11.0	World Trade	12.0
Value Added	7.0	The challenge of technology implementation	18.0
Added value of the product	7.0	Data security	8.0
Innovative services and products	27.0	Data management	10.0
Environmental factors	73.0	Governing factors in the fourth industrial revolution	5.0
social factors	33.0	policy	25.0
Attention to the environment	14.0	Government policy	1.0
Reduce pollution	2.0	Legislation	5.0
Green process	1.0	Intellectual Property	6.0
Green product	1.0	Patent	2.0
Ethical standards	1.0	The connection between industry and university	2.0
Creating value for the customer	2.0	Increasing information literacy	16.0
Social capacity	7.0	knowledge transfer	3.0
Culture and acceptance of technologies of the fourth industrial revolution	7.0	Combining knowledge and technology	1.0
Adoption of technology	4.0	Knowledge sharing	9.0
Induction of culture	3.0	Knowledge-based economy	2.0
Stability of conditions	17.0	Continuous research and development	6.0
Market	1.0	Attention to the market and the needs created by the fourth industrial revolution	23.0
Economic security	1.0	Commercialization	4.0
Economic responsibility	3.0	market studies	8.0
Environmental changes caused by the fourth industrial revolution	12.0		

Table 4: Categories of background conditions

Paradigm	**Subcategory**
Background conditions paradigm	Environmental factors
	Organizational factors

Table 5: Categories of causal conditions

Paradigm	**Subcategory**
Causal conditions paradigm	Internal factors
	External factors

- Core phenomenon categories

  Based on the secondary coding results of the research, agility, capable intellectual resources, value chain and services, and innovative products were selected as the central phenomenon categories in presenting the competitiveness model of knowledge-based companies in the fourth industrial revolution.

Table 6: Categories of the central phenomenon

Paradigm	**Subcategory**
Competitiveness in the fourth industrial revolution (the main phenomenon)	Agility
	Powerful intellectual resources
	Value Chain
	Innovative services and products

- Categories of strategies and actions

  Based on the results of the secondary coding of the research, the indicators of the relationship between industry and the university, Increasing information literacy, continuous research, and development, determining strategy, investing in technology, paying attention to the environment, capability building, paying attention to the market and the needs created by the fourth industrial revolution, laws appropriate to the characteristics of the fourth industrial revolution, identifying the advantage of technology were selected as strategies in presenting the competitiveness model of knowledge-based companies in the fourth industrial revolution.

Table 7: Categories of Strategies and Actions

Paradigm	**Subcategory**
Strategies and actions	The connection between industry and university
	Increasing information literacy
	Continuous research and development
	Determining the strategy
	Investing in technology
	Attention to the environment
	Capability
	Attention to the market and the needs created by the fourth industrial revolution
	Laws appropriate to the characteristics of the fourth industrial revolution
	Identify the advantage of technology.

- Categories of intervening conditions

  Based on the secondary coding results of the research, the data challenge index in technology implementation, governance factors in the fourth industrial revolution, and international drivers of the fourth industrial revolution were selected as the categories of intervening conditions in presenting the competitiveness model of knowledge-based companies in the fourth industrial revolution.

Table 8: Intervening condition categories

Paradigm	**Subcategory**
Intervening conditions paradigm	Data challenge in technology implementation
	Governing factors in the fourth industrial revolution
	International Drivers of the fourth industrial revolution

- Categories of consequences

  Based on the results of the secondary coding of the research, survival, and value creation were selected as categories of consequences in presenting the competitiveness model of knowledge-based companies in the fourth industrial revolution.

Table 9: Intervening condition categories

Paradigm	**Subcategory**
consequences paradigm	survive
	Creating value

- Selective encoding

Data integration is critical in fundamental theorizing. In the research process, after collecting data, analyzing and interpreting them, it is time to present the model, conclusion, and summarization of the research. In the first step, the obtained data were classified into 24 main categories by examining the current situation. In the second step, we sought to design and present a model for the competitiveness of selected knowledge-based companies in Iran in the fourth industrial revolution to perform selective coding based on the theoretical model. Finally, in the third step, we presented the model.

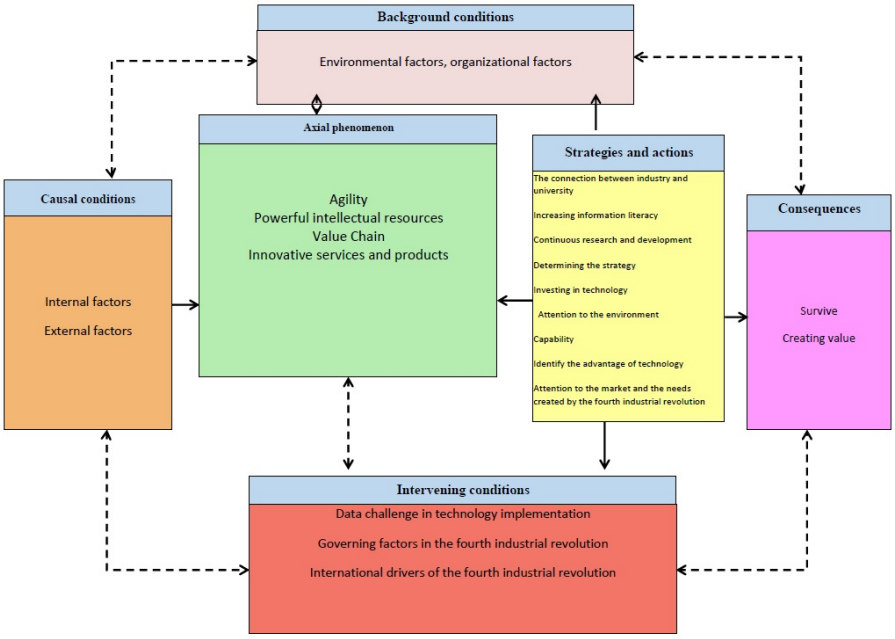

Figure 1: The competitiveness model of selected Iranian knowledge-based companies in the fourth industrial revolution

4 Discussion and conclusion

The results showed that the competitiveness model of selected Iranian knowledge-based companies in the fourth industrial revolution includes internal organizational factors, external organizational factors, agility, capable intellectual resources, value chain, innovative services and products, environmental factors, organizational factors, international drivers of the fourth industrial revolution, data challenges in the implementation of technology 04, governance factors in the fourth industrial revolution, the relationship between industry and the university, Increasing information literacy, continuous research and development, identification of technological advantage, capability building, laws appropriate to the characteristics of the fourth industrial revolution, attention to the environment, attention to the market and the needs created by the fourth industrial revolution, determining strategy, investment in technology, survival, and value creation. These results agree with the findings of [4, 11, 16, 18, 21].

As it is known, internal organizational factors for knowledge-based companies have been one of the components of the competitiveness model of knowledge-based companies in the fourth industrial revolution. From management issues to technological infrastructure and organizational structure, the size of the organization, as well as the business model that the organization has presented and works on, all fall under the category of intra-organizational factors. The economic effects of the fourth revolution are revealed in three areas: economy, employment, and the nature of work. We will face three severe economic problems: growth reduction, aging, and productivity reduction. In the field of employment, the replacement of the labor force, the formation of newer skills, and the ineffectiveness of current skills affecting the developing economies are formed. So, in advanced countries, there is talk of the factory returning home, while in developing economies, factory production is still going on, and in such a situation, developing economies will not be able to compete with advanced economies. Like work, self-employed employees have been formed. In fact, in this model, it is not the case that a person is an employee or working in a specific location, but in the cloud space, he can be an employee of 10 or more companies simultaneously.

External factors are another critical component of the competitiveness model of knowledge-based companies in the

fourth industrial revolution. The technology level of the country, the speed of changes, the dynamics of the 04 industry, the shortening of the product life cycle, and generally, the technologies that exist for the fourth industrial revolution are included in this category. According to the organizational ecology theory, competition in the ecosystem depends on the businesses in the ecosystem [7], which are supported by the institutional environment. Ecosystems create an environment based on competition and cooperation of entrepreneurs, which affects the overall level of performance and competitiveness [13].

Agility has been one of the other vital components of the model. In general, agility is characterized by speed and flexibility. Competitiveness is one of the essential issues emphasized in the management and strategic marketing literature in recent years. The development of technology and the growth of global trade today mean that the business environment is changing rapidly and constantly; Therefore, business managers need the information to be on the same side with these changes and provide higher value and satisfy customers in any field. They should have a lot of information about competing companies, mediators, and other active forces and factors in the market. Information is considered one of the crucial items of strategic assets and marketing tools, and competitive intelligence is a way to use this asset of the organization optimally.

Capable intellectual resources are one of the other components that have been important in the competitiveness model of knowledge-based companies in the fourth industrial revolution. Some authors have considered the company's competitiveness from the point of view of competence. They also emphasize the role of internal factors of the firm, such as the firm's strategy, structures, competencies, capabilities for innovation, and other tangible and intangible resources for its competitive success. This view is widespread in the resource-based approach to competitiveness.

The value chain includes components such as the supply chain and added value. Competitiveness is the capabilities and capabilities that a business, industry, region, and country have and can maintain to create a high rate of return in production factors in the field of international competition and put their human resources in a relatively good condition. Competitiveness is the ability to increase market share, profitability, growth of added value, and stay in the scene of fair and international competition for an extended period [1].

The meaning of innovative products and services is the production of more complex products with better quality and more services. The competitiveness of companies is formed in the context of the entrepreneurial ecosystem. As long as entrepreneurs are placed in the right context and environment, they can take unique strategies and lead to micro and macro-level competitive performance.

Environmental factors include culture and acceptance of fourth industrial revolution technologies, stability of conditions, infrastructure, business environment, market size, and social factors. Rapidly changing environmental conditions require organizations to update their strategy and structure to continue their successful existence. It can be said that the change in environmental conditions forces the organization to change its strategies. Knowledge-based SMEs are constantly striving to differentiate themselves from their competitors. Besides being more fluid and having the power to adapt to changing environmental conditions, the most important feature and advantage of knowledge-based companies is entrepreneurship and innovative competitiveness [2].

The organizational factors included in the competitiveness model of knowledge-based companies in the fourth industrial revolution include localization ability, resources, communication skills in the fourth industrial revolution, organizational readiness for the fourth industrial revolution, company culture, and innovative and entrepreneurial culture. Changes in customer expectations, production of improved products with data, group innovation, and new operational models are among the changes that will be formed due to the influence of the fourth industrial revolution on the business field.

Another component of the model was the international drivers of the fourth industrial revolution. Here, components such as international communication and world trade are essential. The characteristic that distinguishes the fourth industrial revolution is the expansion of inequality between economies; In this way, due to the technologies created in this revolution, knowledge workers with high wages are placed against non-knowledge workers, which will cause many jobs to disappear. The other side of this inequality is related to platform owners versus users. In other words, the power in the future belongs to those who own the platform and not just its users. Because one of the main topics in the fourth industrial revolution is platforms that connect the need to the possibility by combining several technologies, the consumer is connected to the producer.

The challenge of data in the implementation of technology 04 has been another component of the competitiveness model of knowledge-based companies in the fourth industrial revolution. Cyber security, the existence of appropriate data, and data analysis are among its important features. Digital technology is the fundamental driving force for the fourth industrial revolution. Almost all the innovations and developments resulting from the fourth wave of the industrial revolution are enabled and enhanced through digital power [17]. This technology cluster is spreading all

over the world. Digital technology is mainly known in four aspects: Internet of Things, Artificial Intelligence and Machine Learning, Big Data, and Cloud Computing, and Digital Operating Systems.

Governance factors in the fourth industrial revolution have been one of the critical categories of the model. Policies, political peace, legislation, and intellectual property all fall into this category. Perhaps one of this revolution's most essential and central effects is on governments. In fact, what happens due to technological changes in the government sphere acts as a double-edged sword. On the one hand, using the capacities and opportunities created through projector technologies makes it possible to improve the governance mechanism and provide better services to different parts of society.

On the other hand, these technologies have increased the entry of non-governmental actors into government governance and have weakened their governance role in various issues. Governments are no longer the dominant power in a country, and due to emerging technologies, the sphere of power is shifting from governments to non-state actors. Therefore, in general, it can be said that in the fourth industrial revolution, it is easier to obtain power than in the past; it is difficult to use, and it is effortless to lose.

The connection between the industry and the university requires changes in university education according to the changes of the industrial revolution. To achieve sustainable competitive intelligence, it is important to have flexible and efficient communication and information infrastructures and establish this system within a strategic framework. This type of intelligence creates flexible and efficient information-communication infrastructures. In other words, structural-organizational intelligence provides the platform for the organization to implement the other three elements of competitive intelligence [5].

Among the other important categories of the competitiveness model of knowledge-based companies in the fourth industrial revolution is attention to the environment, which includes concepts such as compliance with environmental standards, production of environmentally friendly products, and environmental culture. Protecting the environment, paying attention to social responsibilities, and advancing technology have become particularly important for society and should be put on the agenda by companies.

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