

Examining the Compatibility of Luftman's Model to Measure the Maturity of Information Technology Alignment with Organizational Strategies in Iranian Sports Federations

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Abstract

Purpose: In order to design a suitable model for measuring the maturity of the strategic alignment of information technology in sports federations, the present research was conducted with the aim of examining the compatibility of Luftman's model for measuring the maturity of the alignment of information technology with organizational strategies in Iranian sports federations.

Methods: The method of this mixed research is sequential exploratory, which was used to collect data from a semi-structured interview with experts and also a questionnaire for the employees of the federations. Data analysis was done by thematic analysis, Delphi method and structural equations, and finally, after modifying the initial model, the final model of alignment maturity was confirmed.

Results: The findings showed that Luftman's model is not suitable for measuring alignment maturity in Iranian sports federations. By implementing exploratory factor analysis, a model with 39 indicators and 4 constructs was built and the fit of this model was proved by confirmatory factor analysis. In this way, the constructs of "Technical issues and information technology", "Management and authority", "Organization, architecture and work processes" and "Communication, participation and mutual understanding" form the model for assessing the maturity of strategic alignment of information technology in Iranian sports federations.

Conclusion: According to the results, it is recommended to increase the productivity of information technology and also to increase its effect in the working processes of Iranian sports federations.

Keywords: Maturity of strategic alignment, information technology, organization strategies, sports federations.

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Introduction

The productivity and effectiveness of professional programs in the future depends on the awareness and use of information technologies, and sports and entertainment organizations and businesses must align all communications, programs, services and human resources with this technology in order to succeed (Jalilvand et al., 2019). Studies in 2018 have shown that investment in information and communication technology constitutes 60% of the costs of sports organizations in America (Cortsen & Rascher, 2018). In Iran, this amount is reported to be more than 40% in the studied organizations (Fattahian et al., 2020; Jalilvand et al., 2019). Since studies conducted in Iran have shown that one of the biggest challenges facing current organizations is the degree of strategic alignment of information technology with the organization's strategies (Cortsen & Rascher, 2018), it is very important to pay attention to the method of measuring this alignment. Studies on the subject of maturity of information technology alignment in the world in industrial organizations have been leading compared to other organizations. The design of strategic alignment models of information technology has started less than three decades ago, and so far this strategic alignment measurement model in sports organizations has not been clearly explained. Research in Iran has shown that there are no suitable models for the implementation of information technology in Iranian sports organizations (Jafarzadeh Zarandi et al., 2019; Jalilvand et al., 2019). However, in this area, recently Jalilvand et al., (2019) designed a tree model of the development of information technology infrastructure of sports organizations from the point of view of physical education and sports experts. Also, Jafarzadeh Zarandi et al., (2019) reported that there is no optimal model for the design of information technology infrastructure in Iranian sports organizations, and as a result of their research, they designed and

recommended a model for this purpose. Slim et al., (2021) confirmed that the issue of strategic alignment of information technology has not been considered in the Middle East, as well as the sports organizations of the world and Iran (Slim et al., 2021). The only research that has been conducted in Iran in this field is related to the study of Omid Ghanbari et al., (2017), which also reported the level of alignment at an average level.

Information technology alignment means how well information technology and organization activities and processes are aligned with each other (Chen, 2010). The evolution of Luftman's model in measuring the alignment of information technology strategies with the organization's activity and process strategies led to the presentation of several main variables in this field. The indicators of "communications, participation, competence/value, scope of action and architecture, level of exercise of authority and skills" have been agreed topics in the examination of this alignment (Luftman, 2000; Al-Hashem & Abu-Orabi, 2021). In addition to Luftman's model, the strategic alignment model of Henderson and Venkatraman (1993), the alignment model of Kazman et al. (2005), the strategic alignment model of Clark (1994) and the strategic alignment model of Wise (2004) have also been proposed in recent years and have fans (Slim et al., 2021). In their study, Kalender and Zilka (2024) examined 42 IT strategic alignment maturity models and concluded that strategic alignment maturity models are evolving and need to be updated in continuous modeling processes with changes in digital maturity. Chamkar et al. (2024) stated in their research that the issue of IT alignment maturity in today's organizations is very important due to the important role of information security, and this helps to secure the data of customers, partners, and the organization. Ferreira et al. (2024) also found in Brazilian textile companies that in new industries, the need to align different areas of

knowledge and organizational strategies is crucial for organizations to have greater competitiveness.

In Luftman's strategic alignment maturity model, indicators are categorized into six criteria. The first criterion is "maturity of communication". When knowledge is shared in the organization and technology and business units have a mutual understanding of each other's needs and characteristics, it is called maturity of communication. The second criterion is "participation maturity". The level of trust created between technology and business employees in sharing risks and rewards is called partnership maturity. The third criterion is "maturity of management". To ensure that the right people in business and information technology are engaged in reviewing the priorities and allocation of information technology resources. The fourth criterion is "maturity of organizational competences", which is intended to determine the relationship between the value of information technology and business. The fifth criterion is "maturity of skills (human resources)" which is designed to reflect the level of innovation, readiness for change and attraction and maintenance and their relationship with organizational effectiveness. The sixth criterion is "maturity of information technology (architecture and domain)" which is used to determine the level of flexibility and transparency that information technology brings to business (Luftman et al., 2000).

Iran's sports federations are faced with a large amount of information related to many different fields. Looking at the statutes of Iranian sports federations approved by the Council of Ministers on 2021 (May 5), which was notified to all relevant institutions and organizations through Circular No. 42013 on 2021 (July 10), it can be seen that among the athletes' information, coaches, clubs, competitions, rules, expeditions and camps, ceremonial and administrative relations, international and

national relations, constructions and management of financial and non-financial resources and management of administrative staff and volunteers are the subjects that federations constantly deal with them. While recent investments in the information technology sector are an inseparable part of sports management, it seems that in Iranian sports organizations, the lack of alignment of information technology with the strategy and interests of the organization causes many problems, including waste. resources and funds, and the lack of optimal efficiency of the organization's management and responsibility procedures (Wang et al., 2021). By designing a model to measure the maturity of the information technology strategy in Iranian sports federations, it is possible to measure the alignment of the information technology strategy with the organization's goals. Then it is possible to plan and apply changes to maintain suitable conditions or to improve conditions to an optimal level. According to what was stated, the main question of the current research is whether the model of measuring the maturity of the strategic alignment of information technology in the sports federations of the Islamic Republic of Iran is consistent with Luftman's model?

Materials and Methods

The current type of research is based on the practical purpose and based on the method of data collection, it is a mixed exploratory sequential and cross-sectional in terms of time. In order to measure the efficiency of Luftman's model in measuring the maturity of the strategic alignment of information technology in Iran's sports federations, first a semi-structured interview with experts and experts (authors of sports communication books and articles, information technology officials of the headquarters of the Ministry of Sports and Youth and the federation sports, university professors in the field of sports management and information technology management) this

field was carried out in order to identify indicators in the categories introduced by Luftman's model. In this way, the initial maturity model of the strategic alignment of information technology in Iranian sports federations was set based on Luftman's model. In the next step, to test this confirmation of this model, as well as modify or create a new model for sports federations, a questionnaire was prepared based on the main criteria obtained, which was completed by the federations' employees.

In the qualitative part (interview), the sample size depended on reaching theoretical and technical saturation, and finally 12 people participated in this research. The sample size in the quantitative section was determined based on the characteristics of the sample size in structural equations. For this purpose, after the first stage of the research and the construction of the initial research model and the indicators of the research questionnaire, based on the definitions and relationships related to the structural equations, the desired sample size was determined to be 300 people. After collecting quantitative data, the adequacy of the sample size was checked using two tests, KMO and Bartlett, and the adequacy of sampling was confirmed.

The interview started based on the variables of "communication, participation, competence/value, scope of action and

architecture, level of exercise of authority and skills" which were taken from the model of Luftman (2000) and the questionnaire of Manian et al. (2008) to evaluate the alignment of the strategy. It is information technology. This information was checked using MaxQDA software and content analysis method to identify the appropriate indicators in building the model. After that, the identification of agreed indicators was confirmed by Delphi

method. In this stage, the known indicators from the qualitative stage were used in the two subjects of designing the initial model and building the questionnaire. After building the initial model, it was concluded from the group of experts whether the initial conceptual model is approved or not. After confirming Luftman's initial model, a questionnaire was designed to evaluate the model. In designing the questions of the questionnaire, two issues were considered: 1- the questions should be based on the known indicators of the initial model and 2- each of the questions should have theoretical and scientific support. Validity and reliability of the questionnaire were checked and after confirmation, sampling was done in the relevant units. The reliability of the questionnaire with Cronbach's alpha showed a coefficient of 0.84. The characteristics of the experts participating in the research are shown in Table 1 and the organizational affiliation of the employees involved in the research is shown in Figure 1. ch is shown in Figure 1.

Table 1. Characteristics of experts participating in the research

Organization	Author of book or article	the profession	education	Frequency
Ministry of Sports	✓	Chief	P.H.D	1 person
Ministry of Sports	✓	Chief	Master's degree	1 person
Ministry of Sports	✓	Technology Manager	P.H.D	1 person
Ministry of Science	✓	Professor of Sports Management	P.H.D	1 person
Ministry of Science-Sports Federation	✓	Professor of Sports Management	P.H.D	1 person

Ministry of Science	✓	Professor of Information Technology	P.H.D	1 person
Sports Federation	✓	Chief Technology Manager	P.H.D	1 person
Sports Federation	✓		P.H.D	1 person

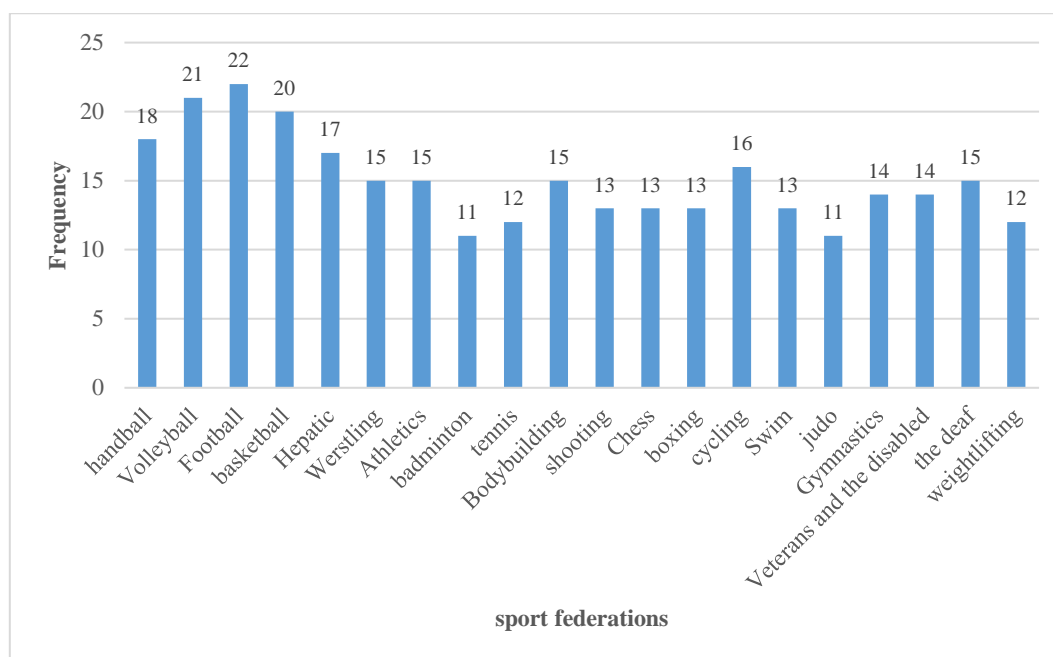


figure 1. The frequency of employees participating in the research (quantitative sector samples) by organizational affiliation

Results

From the content analysis of the data obtained from the interviews, 66 concepts were identified as factors for evaluating the strategic alignment of information technology in federations. Then, using the fuzzy Delphi method, the approval or disapproval of each of the obtained concepts was checked from the experts' point of view. The Delphi method was concluded in the third round, and full agreement was reached on 52 concepts.

Sampling adequacy was checked using Bartlett's KMO statistical test and it was

observed that the sampling has the necessary adequacy ($KMO=0.977$ and $P=0.001$). The initial conceptual model that conformed to the shape of Luftman's (2000) model (Figure 1) was examined using confirmatory factor analysis.

The results of the first and second order factor analysis showed that Luftman's model does not have a good fit based on the data obtained in this research. Therefore, it can be said that Luftman's standard model is not a suitable model for evaluating alignment maturity in Iranian sports federations (Figure 2).

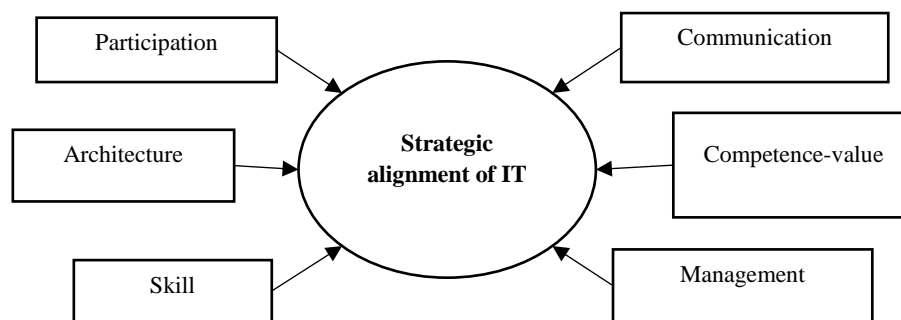
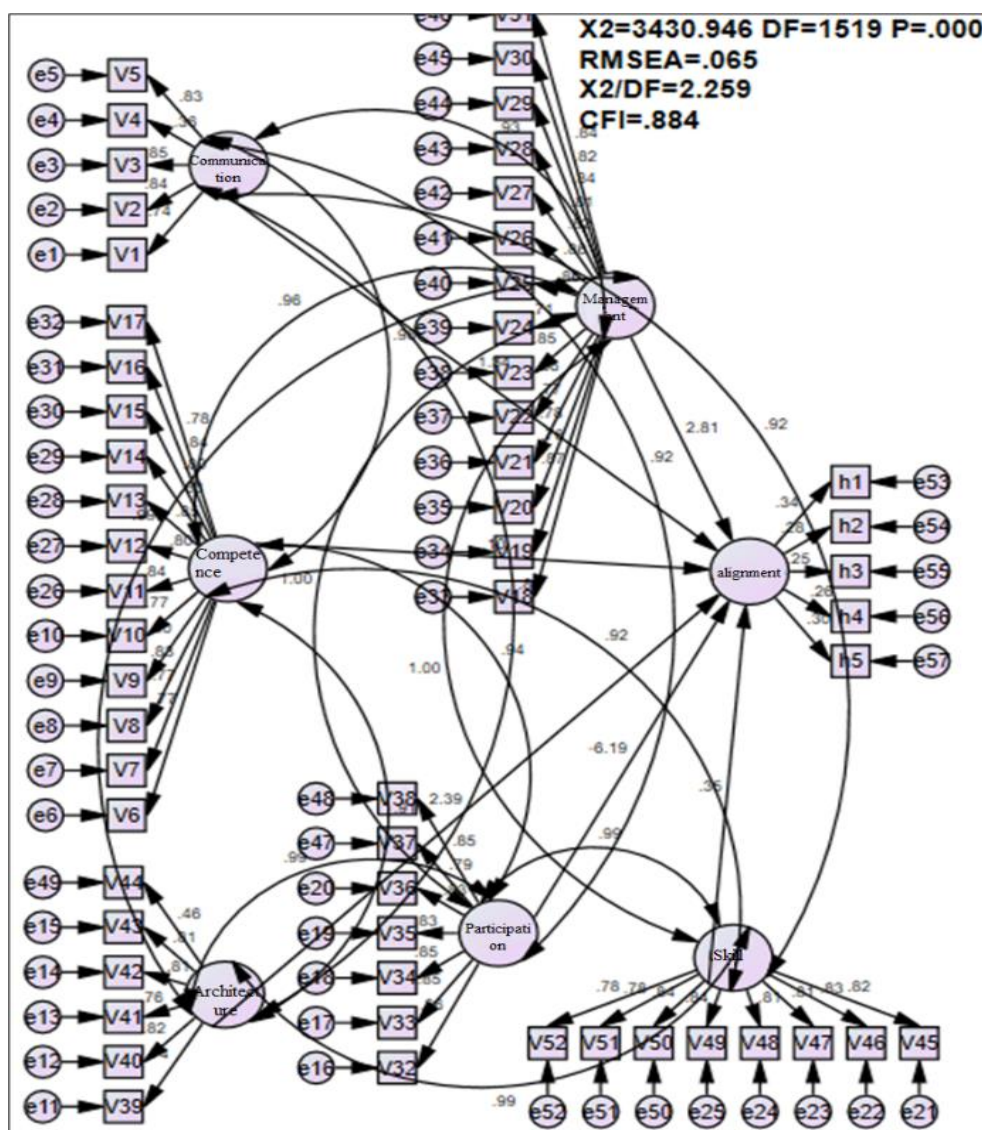


Figure 2. The initial model for assessing the strategic alignment of information technology in sports federations based on Luftman's model (2000)

In the next step, to design a suitable model for evaluating the maturity of strategic alignment, an exploratory factor analysis was performed to identify the structures that make up a suitable model. By performing exploratory factor analysis, after removing the factors with factor loading less than 0.3, four main constructs were formed and the main factors were obtained. It was observed that the explanatory variance of four of the observed factors was above 1 (figure 3). These four factors alone accounted for 70.22% of the explained variance. These findings show that out of 52 known factors, 40 factors are confirmed in the exploratory model,

which are the 4 main constructs that explain the strategic alignment evaluation. Therefore, the model of Figure 4 was obtained from the relationships between variables and data. In the following, confirmatory factor analysis was performed to check the built model. First-order factor analysis showed that factor v4 has the lowest impact factor (0.42), which was removed from the model. Confirmatory factor analysis of the final model with 39 remaining factors showed that the relationship between technical factors, participation, management and organization has a good fit (Figure 5).



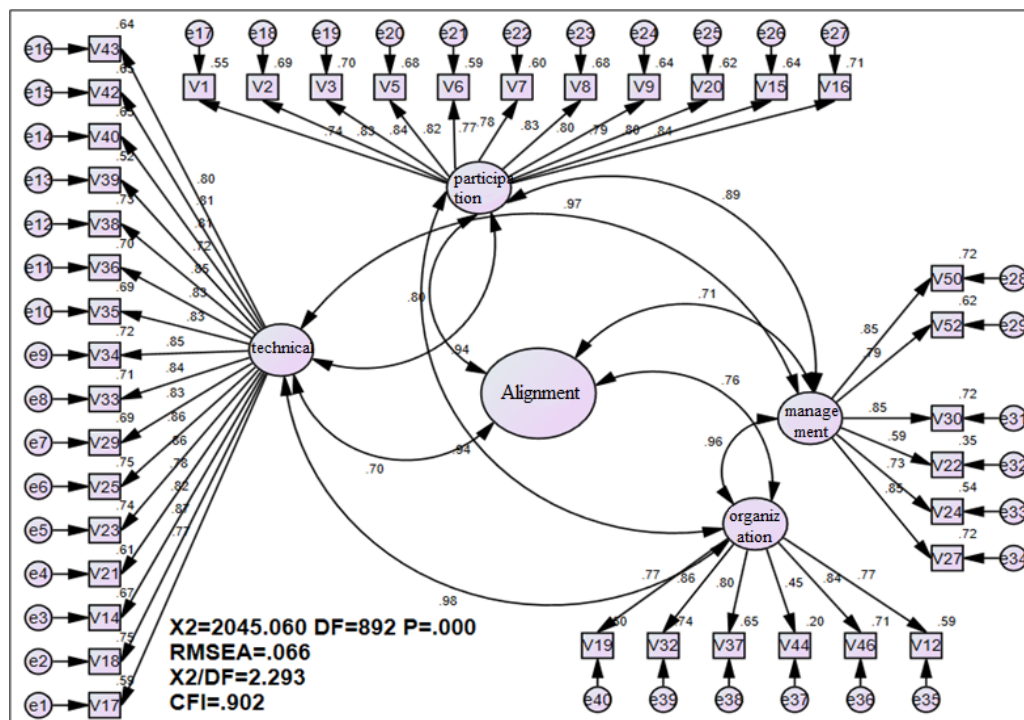


Figure 5. Second-order confirmatory factor analysis of alignment maturity model

The results of the second-order confirmatory factor analysis showed that the values of the significance level ($P=0.000$), and the RMSEA and X^2/DF indices were confirmed, and the CFI value was equal to 0.903 and more than 0.9. Therefore, the strategic alignment model of information technology in sports federations is

confirmed with four main structures and 39 factors

Finally, based on these results, the maturity measurement model of the strategic alignment of information technology in Iranian sports federations was drawn in Figure 5.

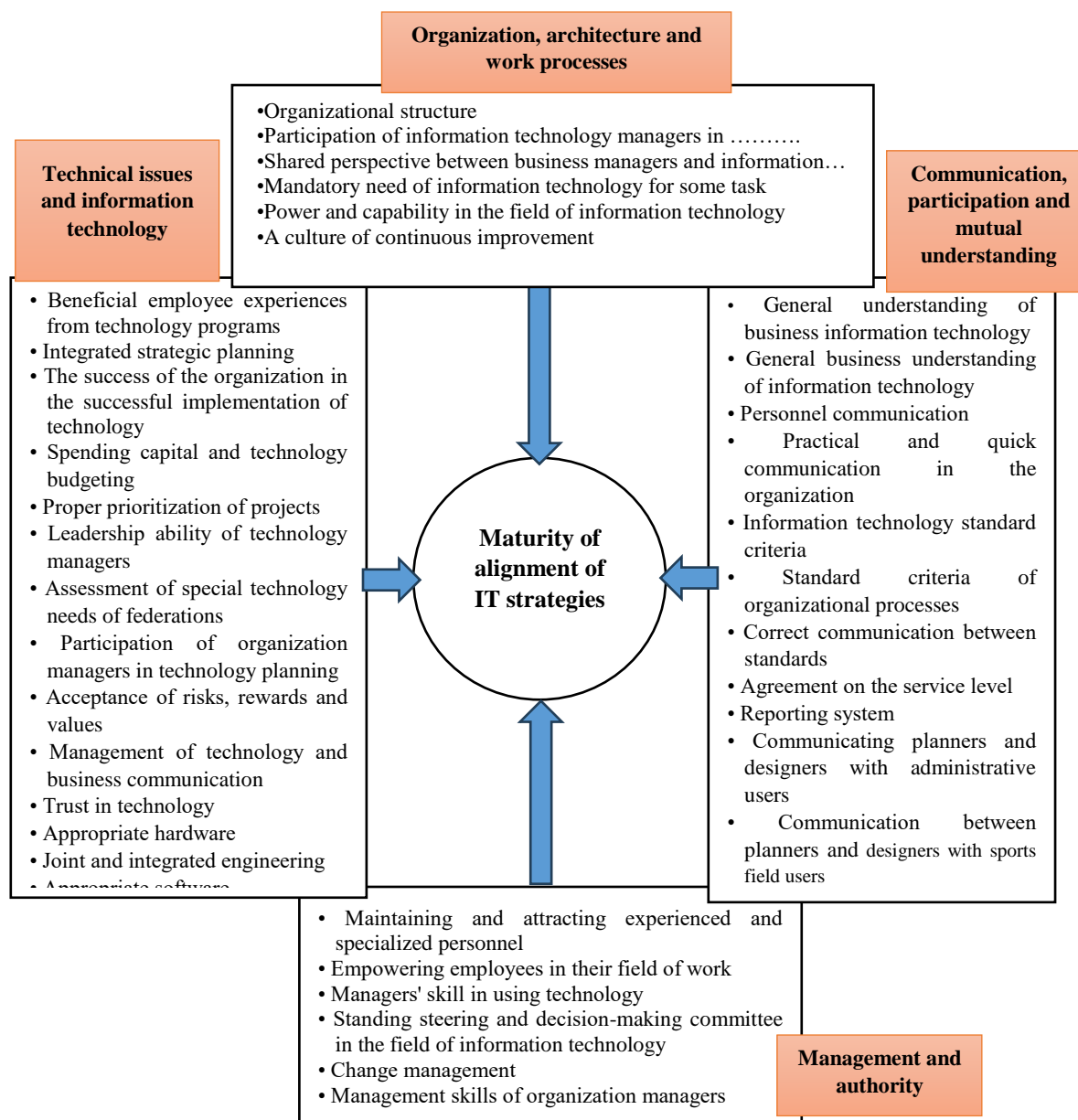


Figure 6. Maturity assessment model of alignment of information technology and work in sports federations of Iran

Discussion

The results of the research showed that Luftman's model in evaluating alignment maturity, which includes six indicators of communication, participation, competence/value, scope of action and architecture, the level of exercise of authority and skills, does not match with the information technology strategies and the work of Iranian sports federations. And it is not a suitable model for this evaluation. While past research has also shown that other strategic alignment

models have been designed and used for different organizations. So that the models of Henderson and Venkatraman (1993), Kazman et al. (2005), Clark's strategic alignment model (1994) and Wiese's strategic alignment model (2004) are also agreed upon and in order to evaluate the level of information technology alignment And the business of organizations has been used.

The research results of Ferreira et al. (2024) in Brazilian textile companies, Visscher et al. (2021) in German industrial companies, Wang

et al. (2021) in Chinese industrial companies, Al-Hashem and Abu Orabi (2021) in Jordanian industrial companies, and Slim et al. (2021) in small and medium-sized companies. In Iraq, they showed that Luftman's model matches the needs of alignment maturity assessment in the studied organizations, which is not in line with the results of the present research. It seems that the measurement of alignment in sports organizations is not in accordance with the measurement of alignment in industrial organizations. On the other hand, in line with the results of the current research, the research that has been done in sports organizations on the subject of information technology and organization business has shown that the important indicators in these organizations are unique and create their own model. So that the results of research by Garza Sagovia and Kennet (2022) showed that strategic alignment in sports organizations is based on sports and internet indicators, consumer behavior, and sports marketing strategy. Also, Gerke et al. (2021) also reported in their study of Australian golf clubs that the alignment of technology and business strategies relies on dynamic management indicators. Torres Ronda and Schelling (2017) also reported in their study of large European clubs and sports organizations that the implementation model of information technology aligned with the organization's strategies will be possible in 4 stages.

According to the explanation of the maturity assessment model of the alignment of information technology and business in Iran's sports federations and its non-compliance with Luftman's model, it can be said that the maturity model of alignment in Iran's sports organizations is also specific to the conditions and laws. is itself This model, which was designed by the opinion of experts and confirmed by the survey data of the employees of Iranian sports federations, can be specifically used by managers of Iranian sports federations.

The results showed that technical issues and

information technology play an important role in the maturity of the strategic alignment of information technology in Iranian sports federations. In this regard, the research results of Nedaei and Nemati (2022), NikPey Motlag et al. (2021), Jafarzadeh Zarandi et al. (2019), Jalilvand et al. (2019), Fattahian et al. (2020), OmidGhanbari et al. (2017) and Biryaei and JamPorAzMey (2010) also showed that information technology and its related technical indicators are effective in forming a successful work strategy in sports organizations, which is consistent with the results of the present research. Also, Aljassar et al. (2023) and Garzasagovia and Kennet (2022) stated as a result of their research that in today's professional management, there is a necessary need for the alignment of information technology and business so that any organization can continue its successful life.

In order for organizations to make the performance of their employees more efficient and effective in terms of educational and specialized level, they should motivate and encourage their employees to use technology in parallel with the speed of technological changes and their level of technological awareness and literacy. also increase (Mohammadi et al., 2017). While it has been observed that not only in Iranian sports federations but also in all Iranian sports organizations, the role of information technology is very important and fundamental in facilitating and succeeding the organization's functions (Mohammadi et al., 2017), therefore, measuring the factors of alignment of technology with strategies By using the information obtained from this research, the organization can be effective in developing this usefulness. Increasing the technical skills of employees and their beneficial experiences can also be effective in the maturity of information technology alignment. Nedaei and Nemati (2022) also stated as a result of their research that by increasing the knowledge and technology literacy of employees, their performance in

sports organizations also develops. While Mohammadi et al. (2017) in their study reported that the information technology literacy of the Iranian Physical Fitness Federation is much lower than the federations of other countries and the World Federation, unfortunately, there is no other comparative research available. Therefore, it is necessary to use the information technology strategic alignment maturity model explained in this research as a tool to measure and compare the level of each federation with its previous level.

The results of this research showed that communication, participation and mutual understanding is a determining factor in the level of maturity of the strategic alignment of information technology in Iranian sports federations. The results of this research are in agreement with the results of Sarvari et al. (2020) is consistent about the role of participation and mutual understanding of organizational components in the success of information technology in sports organizations. Participation and mutual understanding in the organization includes issues such as social and non-social behaviors, aggression, superiority, self-confidence, and communication with colleagues, which has a nature in the field of social communication and necessarily requires a suitable platform for expressing or flourishing properly and positively. (Robbins et al., 2018). Managers, relying on their leadership ability, with regard to creating opportunities for participation and collective and individual influence on the work processes of the organization, will lead to the ultimate participation of more employees (Lee et al., 2015). According to the results of the present research, it was observed that the communication and participation of the work areas with the information technology unit in sports federations can lead to the growth of the strategic alignment of information technology in the organization (Chamkar et al., 2024). When the management of the federation with effective leadership tries to respect others and

tries to create mutual trust and respect between themselves and their subordinates, the satisfaction of the employees of the federation is achieved and as a result their capabilities emerge (Hersey and Blanchard, 2013). Managers trusting and giving opportunities to employees leads to trust and loyalty of employees (Lee et al., 2015). When the management of federations with effective leadership provides fair opportunities to the employees to make decisions about the way of implementation of affairs and act with creativity and its application in job duties, team synergy is developed (Zaki & et al., 2014). In fact, this development of team synergy occurs as a result of increasing individual learning and improving team skills (Zaki & et al., 2014). A leadership style that limits employees' scope of control has a lower relationship with employees' team performance than styles that give employees more authority (Tuuli & Rawlinson, 2010). Therefore, while the working nature of sports federations is based on the interaction of work areas and especially the close interaction with information technology, therefore, the participation of the employees of unit managers and senior managers and subordinates together can achieve the ultimate goal of the success of all employees of the federation and achieve Lead to the strategic alignment of information technology with the strategies of the organization.

The results of this research showed that management and authority is an effective factor in determining the maturity of the strategic alignment of information technology in Iranian sports federations. The results of research by Ashraf Ganjavi et al. (2018), Sarvari et al. (2020), Beiryaei and JamPor Az Mey (2010), Huang and Qiu (2024) and Garzasagovia and Kennet (2022) also It showed that management and authority and its related factors have a positive relationship with the functions of information and communication technology in sports organizations, which is in line with the results of the present research. Strategic

management benefits from connecting human resource management with short-term and long-term strategic goals to improve the organization's performance and create an organizational culture that can strengthen flexibility and creativity (Mirspasi, 2011). Applying strategic management within the framework of the above-mentioned definitions, in which the systemic, contingent and strategic approach is considered, requires that the tasks and actions within the framework of reasonable and orderly processes are mixed with each other so that the interests of the employees and the interests of the organization and The community will find more common ground. Therefore, strategic measures in the human resource management system should be applied to increase the intersection of these three categories of interests (Koehler et al., 2015).

The results of this research showed that the organization, architecture and work processes play a role in the maturity of the strategic alignment of information technology in the sports federations of the Islamic Republic of Iran. Azizi et al. (2012) considered the structure of the organization to be effective in the performance of information technology. FaridFathi and Shahlaei (2013) stated that total quality management and information technology have a two-way relationship. Garzasagovia and Kennet (2022) showed that in future sports organizations, architecture emphasizes alignment and there is a clear need to create strategic alignment of information technology and the organization's business. As a result of their research, Gerke et al. (2021) showed that the dynamics and periodic adjustment and adaptation of the organization's architecture are effective in the maturity of alignment in Australian golf clubs. Lopez et al. (2021) stated that the alignment of the strategies of the American Basketball League organization with the strategies of information and communication technology has led to the growth of the activity of virtual computer competitions in this field.

Also, in line with these results of the current research, researches have reported similar results in non-sports organizations as well. Vischer et al. (2021) showed that there are important differences in the strategies of each organization, that the alignment of information technology with the specific strategies of each company is necessary for the continuous development and stability of organizations. Wang et al. (2021) reported the role of interactive leadership and organizational culture and meaning in Chinese organizations in the alignment of information technology process in business strategy.

Conclusion

By using the strategic alignment maturity model obtained in this research (figure 5), it is possible to examine the alignment maturity in Iranian sports federations and try to take steps in the development of this maturity by promoting the identified factors. In confirming the model obtained in this research, the important and effective models that have been approved in recent years in the world are also comparable with this model. This comparison shows that alignment maturity indicators in different models are very similar to each other and there are some differences specific to each model. The strategic alignment model of Henderson and Venkatraman (1993) in the factors of the organization's infrastructure and processes, information technology governance and its technical issues, and employees' information technology skills is consistent with the current research model. Also, in Luftman's strategic alignment maturity model (2000), the factors of communication and participation, value competence, management and authority are consistent with the current research model. This similarity can be seen in the strategic alignment model of Kazman and Michen (2005) in the two factors of business architecture and information technology architecture. Clark's strategic alignment model (1994) is also consistent with the model of this

research in the factors of organization structure and information technology. In the wiese (2004) alignment path model, communication factors and interdepartmental integration are among the common factors with the current research model. In the Kearns (2001) strategic alignment model, which focuses on several main and specific factors, among the six factors introduced in the model, four factors are "participation of senior information managers in business planning, participation of senior executive managers in planning" Information technology, the alignment of the information technology program with the business plan, the alignment of the business plan with the information technology program" is aligned with the current research model. The strategic alignment model of HP (Hewlett Packard) is also consistent with the current research model in the factors of participation, information technology and organizational culture. Therefore, the model designed in the current research has a high alignment with the previous models.

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