



Research article

Promoting sustainable global innovative smart governance through the 5th wave theory, via Fuzzy AHP for future SMEs (SME 5.0/hybrid SMEs)

Hamid Doost Mohammadian^{1,*}, Zeinab Ghasabzadeh Langari², Amin Reza Kamalian², Nour Mohammad Yaghoubi² and Hamed Aramesh²

¹ University of Applied Sciences (FHM), 33602 Bielefeld, Germany

² Department of Management, University of Sistan and Baluchestan, Zahedan. Iran

* **Correspondence:** Email: doost@fh-mittelstand.de; Tel: 004917620826905.

Abstract: With the advancement of technology and Smartening, governments have realized that the most essential feature of business models is the emphasis on knowledge and innovation, and that governance needs innovation to be sustainable. Modern organizations today are looking for new solutions to create public value through innovative, effective, human-service-based services and decision-making using the potential of modern and digital technologies to provide the tools needed for organizational development and sustainability. The present study is of a practical type and specifically based on structural equation modeling. Data collection tools are standard questionnaires whose validity was assessed using the content validity method and their reliability was assessed using Cronbach's alpha test. The statistical population of the research included some government organizations of Iran and the sample size was calculated using G*power software and the number of people was estimated to be 284. Findings showed that with 95% confidence, the variables of 7 Pillars Sustainability (7PS) and innovation culture have a positive and significant effect on organizational sustainability. while indirect path analysis reveals the mediating role of innovation culture in the impact of the 7PS on organizational sustainability. Also, FUZZY AHP was used to determine the weight and importance coefficient of the criteria of the 7PS Model, and the culture with the highest score was given the first priority.

Keywords: organizational sustainability; culture innovativeness; the 5th wave theory; 7PS model; 9PSG model; implementing scenarios; applications and technologies; sustainable global innovative smart governance; KTB model; 3D Socio-Eco-Environment SMEs model; SME 5.0/Hybrid SMEs; Structural Equation Modeling (SEM); FUZZY Analytic Hierarchy Process (AHP)

1. Introduction

Based on the 5th wave theory, we first need to forecast future concerns, then prevent them, and finally, get ready to face them. In the tomorrow age theory, from 2020 to 2030 is the first stair to the edge of tomorrow (future), so today's challenges and tomorrow's crises should be considered. Prof. Dr. Hamid Doost Mohammadian in his articles, books, and speeches, believes that challenges and crises such as the Covid-19 pandemic and future pandemics play a role like a SUPER ACCELERATOR for governments. So smart governance (based on the 9PGS model) by combining human factors, culture, management methods and advanced technologies like AI and IoT can turn this super accelerator from threat to opportunity. Today we have passed the first wave (agricultural age), second wave (industrial age), third wave (post-industrial/information age) and fourth wave (virtual reality/digitalization era) and we are ready to enter tomorrow's age or the 5th wave theory! According to the 5th wave theory, we encounter conditions that include the following: 1) all phenomena go to the pandemic 2) global instability under the pretext of stability 3) the singularity and development of artificial intelligence and 4) globalization due to complex global conditions. Therefore, today's challenges and tomorrow's crises, the process of managing these conditions and policymaking for governance, monitoring and control requires a committed, specialized, and qualified human resource that can have high speed and accuracy with the help of future 4th technologies which is called the 5th technologies. Governments in this situation require a change in their governance models towards sustainable global smart governance, especially in business models and technological dimensions. Governments are looking for new ways to create public values through innovative, effective, human-service-based services and decision-making using the potential of modern, digital technologies to provide the tools needed to develop, maintain and improve human livability and quality of life to achieve sustainability. With the advancement of technology and Smartening, governments have realized that the most essential feature of business models is the emphasis on knowledge and innovation, and that governance needs innovation to be sustainable. In fact, they relate the culture of innovation to the environmental, social, economic, educational, technical, and political dimensions of the 7PS model. Therefore, according to the theory of comprehensive everything for the various different businesses, recognizing and managing today's challenges and tomorrow's shocks based on the 3D Socio-Eco-Environment SMEs model whose priorities are: (1) Environmental responsibility, (2) Social cohesion and (3) Economic efficiency, is necessary to prepare for tomorrow's crises. It should be noted that, based on the review of previous research, it is observed that there are many factors that can be effective in the formation of sustainable innovative behaviors in organizations. Some have mainly studied internal factors such as the influence of environmental management concerns [1], the role of organizational green culture [2], control orientation and flexibility [3] in the formation of sustainable innovation. Others have studied facilitating factors such as the role of foreign knowledge and its absorption capacities [4], the importance of different sources of internal and external knowledge [5], forms and types of knowledge, including combined knowledge and analytical knowledge and research and development [6]. In other words, they have investigated the impact of knowledge management methods in the formation of sustainable innovation. Some have investigated external pressures such as the influence of non-governmental organizations and the media [7], stakeholder pressure [8], supply chain pressure [9], the importance of government policies [10], and some have investigated internal motivations and the impact of sustainable innovation on the performance of companies [11]. In other words, each of these research investigations have examined part of the determining factors of an innovation culture and sustainable governance. However, the purpose of this research is in the absence

of previous studies, to consider the importance and role of information and communication technology and the culture of digital innovations in societies and the impact on organizations. And it studies the dimensions of high sustainability, including environment, society, economy, education, politics, culture and technology. Also, in the field of governance of sustainable digital innovation, examine the impact of the dimensions mentioned above in the business sector and develop a comprehensive model in the dimensions of high sustainability. Finally, some practical recommendations are presented. This research seeks to provide a framework consisting of all the components of high sustainability and factors that facilitate sustainable innovation in order to lead to green strategies and a new look; The conceptual model should be presented in such a way that it is clearer and easier for policymakers and decision-makers to understand it. It should be noted that the AHP technique and model were used in this research. Because, in addition to determining the priority of decision-making indicators, it has a clear and regular structure of the sequence of goals, criteria and sub-criteria. In this regard, the present study aims to investigate the role of innovative culture in the impact of the dimensions of the 7PS model on organizational sustainability; which is to examine the business models of sustainable global smart governance through the 5th wave theory, 7PS and 9PSG models with the implementation of fuzzy AHP, scenarios, applications and technology.

2. Literature review

2.1. 5th wave/Tomorrow age theory/Theory comprehensive everything

In 2010, Professor Dr. Hamid Doost Mohammadian started his research on the lives of humans in the distant past seventy thousand years ago with the topic of “Prediction, Prevention and Facing Future Concerns”. In fact, the theory of the fifth wave or the theory of tomorrow age, is to predict the future in line with prevention and preparation programs in facing the challenges and crises that societies, economies, businesses, technology and humans will face. This theory was officially introduced and published in Basel, Switzerland between 2017 and 2019 .Basically, the world we live in is undergoing extensive changes and technological advancement. Today, when we have finished the fourth wave, we are in a new stage of evolution and innovation called the fourth industrial revolution. A revolution that is based on digital technology and is much different in terms of scale and scope of complexity than what humanity has experienced through previous industrial revolutions. Therefore, global leadership in the future belongs to countries that can take full advantage of the capacities and opportunities that have arisen through this revolution. Basically, this theory states that on the threshold of the edge of tomorrow, which is from 2020 to 2030, it is necessary for businesses to prepare for tomorrow’s challenges so that they can: first predict, then prevent, and finally face the crisis. Or be eliminated from the competition! In the past decades, innovation has become an important way to fight risks, social threats, challenges and crises. Recently, the challenge of the Covid-19 pandemic caused profound changes in other social, economic, political, technological, cultural, environmental and even educational sectors at a very high speed, which Professor Dost Mohammadian refers to as a super-accelerator in his theory [12]. Over the past two years, the novel coronavirus has led to many restrictions on businesses in many parts of the world, but companies that take advantage of the power of digital and innovative technologies have continued to do business [13,14].

Figure below the 5th wave/tomorrow age theory, illustrates the ages, and technologies that we had passed and the point that we are on:

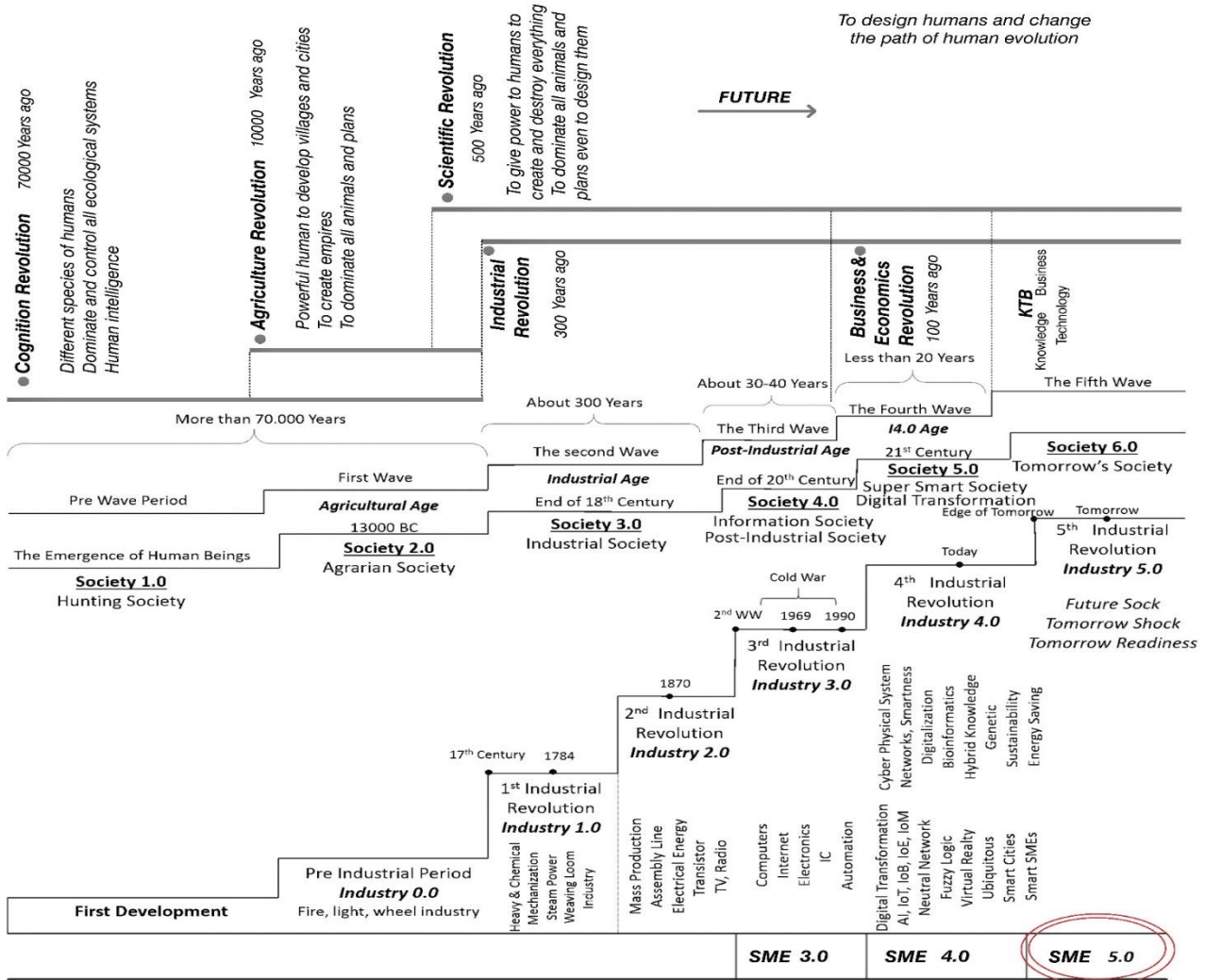


Figure 1. The 5th Wave/Tomorrow Age Theory [12].

2.1.1. Livability (another aspect of the fifth wave theory)

In addition to the concept of being alive, livability is related to the quality of life, sustainability and healthy communities, so as another aspect of the fifth wave theory, livability is strongly emphasized. In other words, since governance plays a significant role in decision-making and policy-making issues on the public health of societies, it can be accepted that sustainable global innovative governance is a way to improve livability [15–24]. Below are the dimensions of livability:

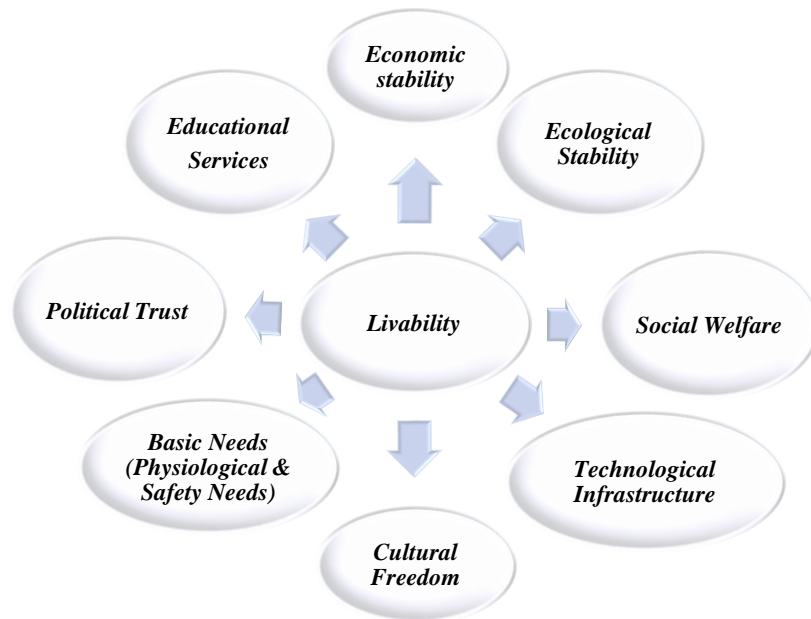


Figure 2. Aspects of Livability [13].

2.2. *Nine pillars of sustainable governance (9PSG) model*

The speed of technological development has caused intelligence to permeate all dimensions of society and there are many expectations from governments to provide quality services in line with the livability and high quality of life of citizens. In other words, the role of the government in today's complex and changing world will be different as well as its responsibilities [25]. Governments alone will not be able to respond to new needs. They should increase responsiveness to new needs by rewriting and increasing their power. This important thing requires a new model of governance that, along with good governance, can use all the capacities of the society in the public, private and civil sectors and become a strategy for achieving the goals of sustainable development [26]. Today's shocks and tomorrow's risks require better governance. Therefore, sustainable governance as a new paradigm of behavioral policy can be used alongside good governance as a Sustainable Global Innovative Smart Governance [27,28]. Professor Dr. Hamid Doost Mohammadian presented a model for sustainable governance in 2017, the dimensions of which are shown in nine Pillars in Figure 3.

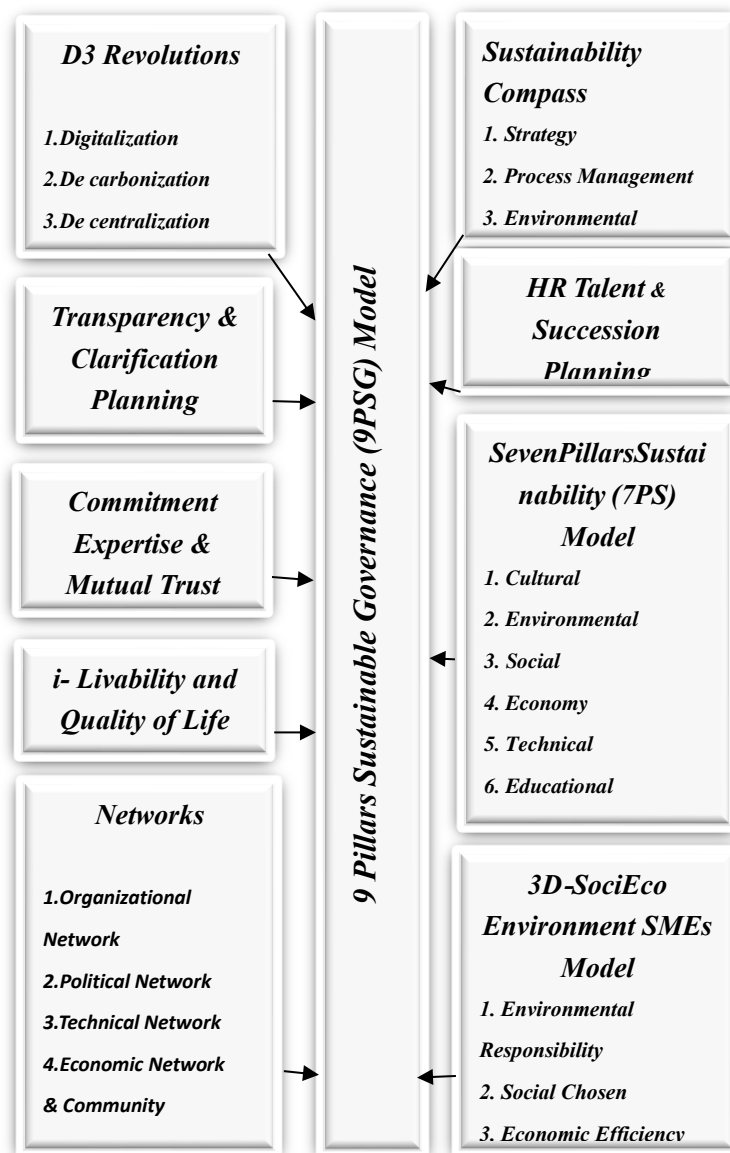


Figure 3. 9 Pillars Sustainable Governance (9PSG) Model [13].

2.2.1. Seven Pillar of Sustainability (7PS) model

In the age of smartness, with the advancement of high technologies and the vast changes that exist, businesses need something more than the traditional dimensions of sustainability (environmental responsibility, social cohesion, economic concern) to survive and sustain. Forecasting and preparing for challenges and crises requires a new definition of sustainability. High sustainability is the reciprocal nature of the traditional dimensions of sustainability with technical, educational, cultural and political dimensions. All seven dimensions of high sustainability must be developed equally, to help businesses drive innovation and implement strategic plans for resilience to shocks. Figure 4, shows these points in addition to PEACE and LOVE [25].

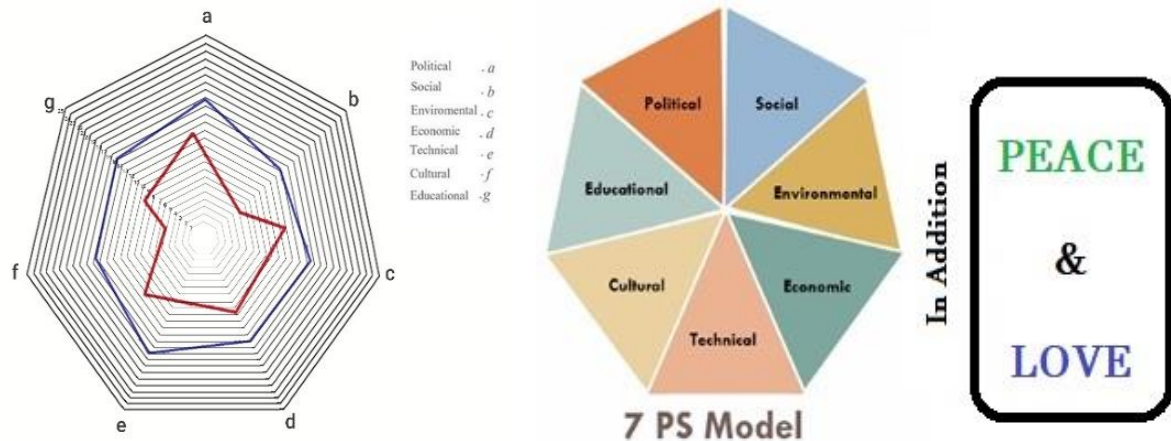


Figure 4. Seven pillars of sustainability (7PS) model [25].

2.2.2. KTB MODEL

Professor Doost's KTB model shows that today's challenges and tomorrow's crises strongly affect three levels (Knowledge, Technology and Business) [12].

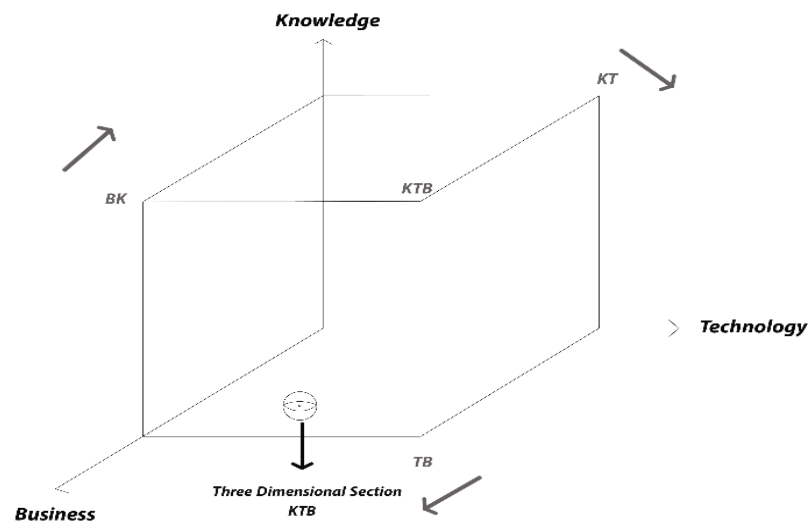


Figure 5. KNOWLEDGE, TECHNOLOGY, BUSINESS (KTB) model [20].

In fact, successful businesses are those that create a paradigm of sustainability for themselves and monitor the changes, opportunities, and risks of the external environment by monitoring the environment and being aware of their strengths and weaknesses. These organizations manage affairs with the aim of creating a balance between the financial and economic, social and environmental interests of the organization in the long term. The scope of the discussion of sustainability is wide at different levels, including macroeconomics, industry and organization. Today, the paradigm of sustainability has largely replaced success in the management literature of organizations, and almost most organizations define the achievement of sustainable success in their value system [29].

In the corona pandemic, the most dangerous challenge of the century and its adverse effects on businesses and SMEs, the importance of sustainability and sustainable development in general, became more and more the priority of societies and companies and took the form of public concern. And the organizations were forced to move towards the sustainability paradigm. In this way, a new concept of organizations with three priorities 1. Environmental responsibility, 2. Social cohesion and 3. Economic efficiency was created, which is shown in Figures 6 and 7 of these types of SMEs [30].

Figure 7 shows how to calculate these three dimensions.

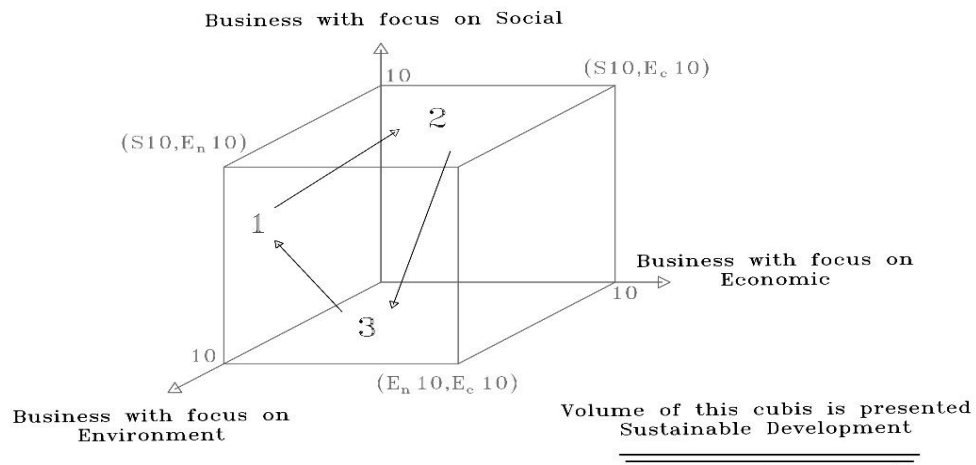


Figure 6. 3D Socio-Eco-Environment SMEs indexes model [22].

2.3. *i-Sustainability plus theory*

The constant changes and developments that are taking place with great speed are one of the most prominent features of the present age that can be seen in many aspects of life. These constant changes and developments along with the development of high technologies and smartness, have made the achievement of organizations their goals in a complex and difficult path. Today, organizations need to be able to quickly adapt to developments in various fields in order to remain competitive and meet the needs of society in order to be sustainable and to survive. In this regard, creativity and innovation as determining factors in the performance of the organization, its success and long-term survival are considered. *i-Sustainability plus* is a theory of high-stability work, innovation and digitalization. In other words, the theory is made up of a trinity that, with today's rapid technological advances, makes businesses more innovative for greater durability and stability in the face of the future of the fourth industry, and places great emphasis on the importance of digital learning. In this theory, innovative management is the innovation in an organization's business, marketing and technology systems to achieve success and the best results [18].

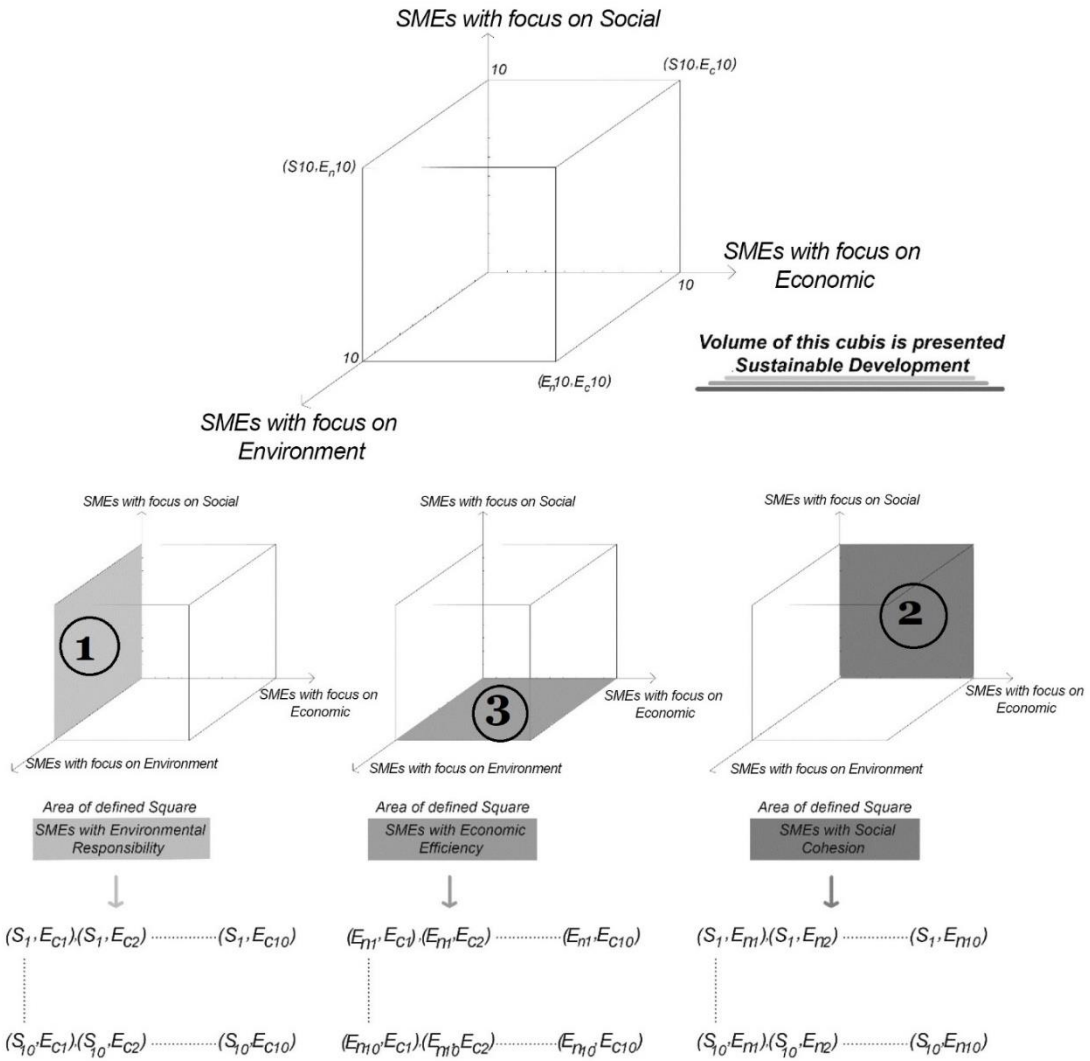


Figure 7. 3D Socio-Eco-Environment SMEs indexes model [20].

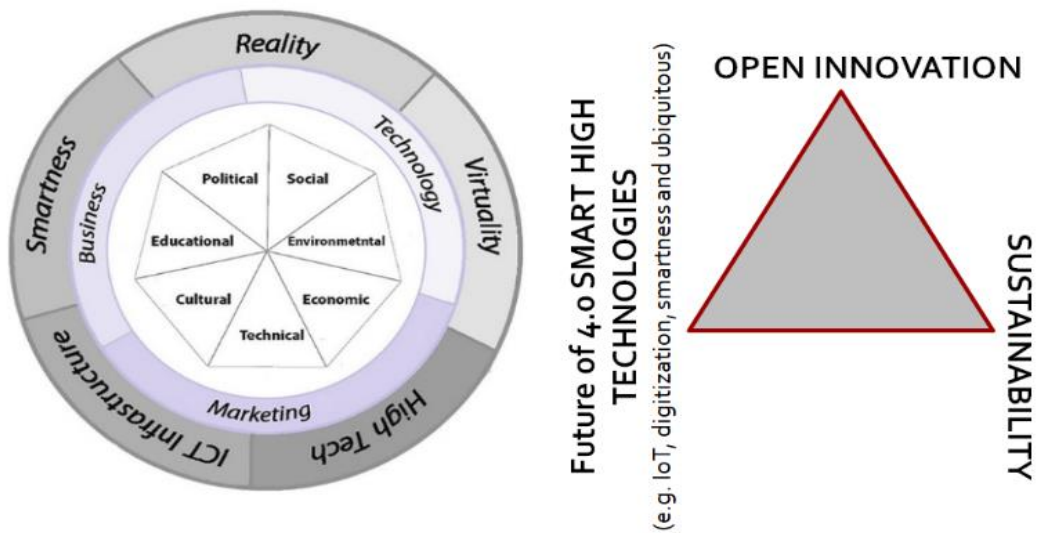


Figure 8. i-Sustainability Plus Theory [31].

2.4. Sustainable innovations and culture

In the world of business, innovations will be more service-oriented and sustainable. In such a way that the traditional product or the product resulting from gradual innovation in addition to innovation in services leads to increased service. Sustainable innovation involves making deliberate changes to a company's products, services, or processes to create long-term social and environmental benefits while generating economic profit for the company. By building sustainability into innovation, companies can create products, services, and processes that benefit both society and the organization. Regarding the difference between traditional innovation and sustainable innovation, traditional forms of innovation may lead to profitable products, services, and processes, but may harm employees or overexploit natural resources. While sustainable innovation seeks to address these unwanted social and environmental impacts. It means that companies can provide products and services that benefit themselves and society in the long run. Unlike traditional innovations that are mostly done in a separate R&D department or unit, sustainable innovations are more successful when they are deeply embedded in the company's culture [32].

2.5. Culture innovativeness (CI)

In this paper, culture innovativeness refers to the values, characteristics, beliefs, willingness to change values, and trying something new that allows for innovation.

The culture of innovation is considered a key factor in the sustainability and success of an organization [33,34]. Research, the involvement of members and program development and are very crucial in ensuring that the organization can persistently pursue innovation and compete in an ever-changing world. This form of cultural identity becomes the guideline for workers in feeling, thinking, and acting [35]. Empirical studies on developing valid measures to assess innovation culture specifically have been carried out by Dobni (2008) and who proposed an innovation model [33–36].

Therefore, in this research, this model was used to measure innovation culture. In fact, this questionnaire includes seven components of Implementation Context (IC), Organizational Constituency (OC), organizational learning (OL), Innovation Propensity (IP), Creativity and Empowerment (CE), Market Orientation (MO) and Value Orientation (VO).

2.6. Sustainable innovations and organizational level

At the organizational level, the term sustainable innovation is used for product/service and process design as well as the company's strategy. Regarding the need for sustainable innovation, he said: sustainable innovation brings a reputation to the organization; As a result, companies committed to sustainable innovation are more successful in attracting talent; They will find a stronger brand and have more loyal customers. Companies committed to innovation can be more innovative because they have access to wider sources of innovation due to having wide networks of different stakeholders. In addition, companies committed to sustainable innovation will have fewer legal problems in the future. With the expansion of national and global laws related to protecting the environment and the interests of stakeholders, companies with sustainable innovation potential will have two advantages over other companies, one is that new environmental laws will not disrupt their business; Second, they generate income with sustainable innovation. Organizations committed to

sustainable innovation are more resilient because they can rely on innovation and customer loyalty in difficult economic conditions [37,38].

2.7. Organizational sustainability

The success of an organization is the degree of achievement of pre-planned goals and organizational Sustainability, the ability to maintain or develop performance in the long term, and the result of continued satisfaction of the organization's stakeholders over time [39].

According to experts, the foundation of organizational sustainability is Reluctance to Simplify (RS), Deference to Expertise (DE), Commitment to Resilience (CR), Preoccupation with Failure (PF) and Sensitivity to Operations (SO). These processes reduce the blind spots of people's resistance and self-restraint and make them accept the change and avoid disastrous consequences [40].

3. Materials and methods

To achieve the research objectives, we have four hypotheses and one main question, which must be answered!

3.1. The research hypotheses are as follows:

H1: The 7PS has a positive and significant effect on organizational sustainability.

H2: The 7PS has a positive and significant effect on Culture Innovativeness.

H3: Culture Innovativeness has a positive and significant effect on organizational sustainability.

H4: Culture Innovativeness has a mediating role in the impact of the 7PS on organizational sustainability.

Therefore, according to the assumptions of the conceptual model of the research, it is shown in the following figure:

3.2. The main question of the research is

How to promote sustainable global innovative intelligent/smart governance through the fifth wave theory, 7PS and 9PSG models? What scenarios, programs and technologies are useful and practical to implement in this field?

To answer the above question, we raise the following sub-questions:

1. What role do SMEs (Small Medium Enterprises) play in governance?
2. According to the fifth wave theory, what are the challenges for SMEs? And basically, how can a challenge like the Covid-19 pandemic be turned into an opportunity?
3. What businesses does the idea of tomorrow's SMEs refer to? And What types of organizations are called hybrid organizations?
4. How can Hybrid SMEs act as a powerful arm of governments and promote governance towards Sustainable Global Innovative Smart Governance?
5. What methods are used to achieve the goals of this research?

In this article, three steps were developed for implementation.

The 5th wave/Tomorrow Age theory/Theory Comprehensive Every Thing

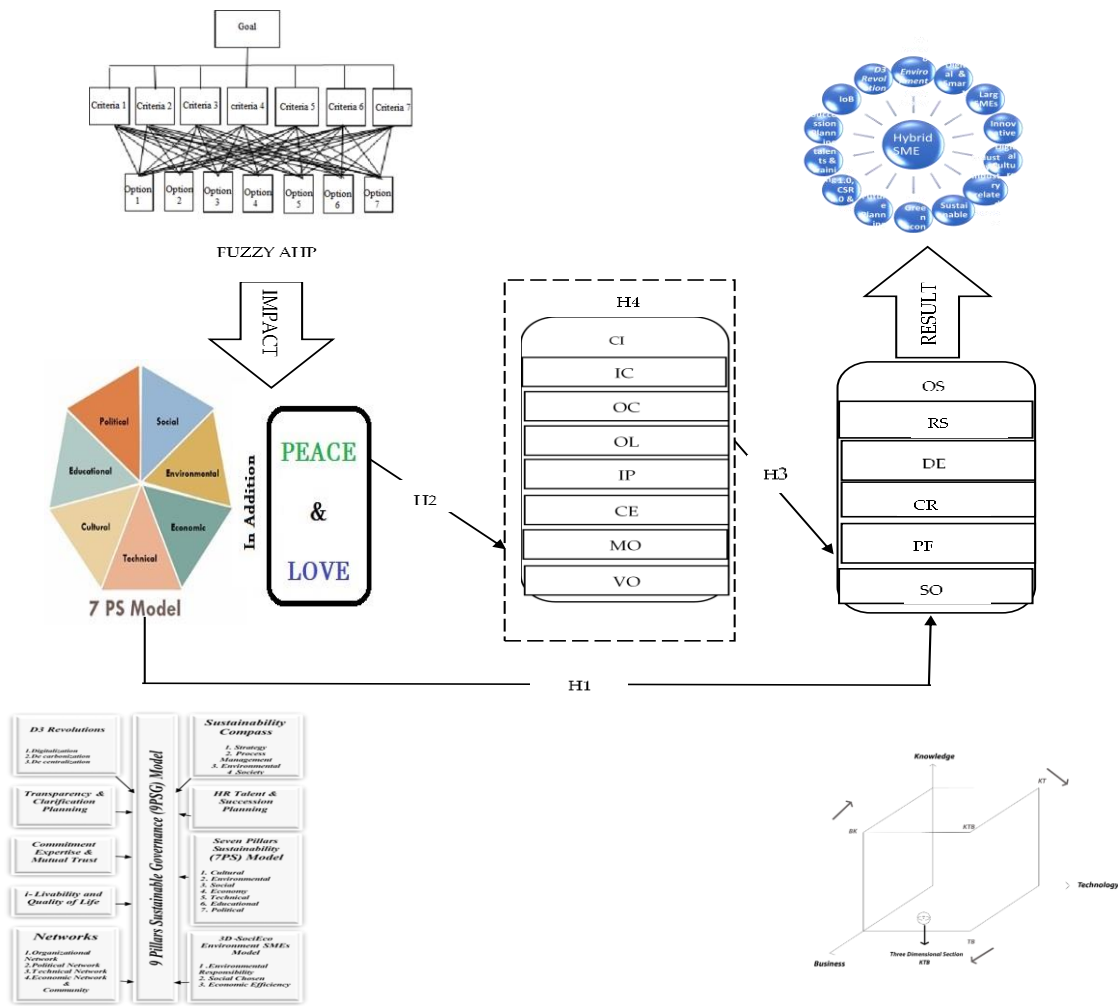


Figure 9. The conceptual model of the research.

3.2.1. Step 1: The development of a research methodology

This stage was developed based on the literature review in Iran related to the promotion of sustainable global innovative smart governance through the fifth wave theory, 7PS and 9PSG models and the implementation of scenarios, programs and technologies. The authors have reviewed most of the previous research in the field of Smart Governance, Smartness, Organizational Sustainability, Innovation, Innovation Culture, the 5th wave theory, pandemic, Super Accelerator, 7PS Model, 9PSG Model, Implementing Scenarios, Applications and Technologies, 3D Socio-Eco-Environment SMEs model, Business models, Hybrid SMEs as infrastructure for Promoting Sustainable Global Innovative Smart Governance.

3.2.2. Step 2: The development of the research tool

This methodology is based on three levels with 5 questions, and analysis has been done through these questions. Also, the present study is of a practical type and specifically based on structural equation modeling. Data collection tools are standard questionnaires whose validity was assessed using

content validity method and their reliability was assessed using Cronbach's alpha test. The value of .703 for the organizational sustainability questionnaire, .751 for the 7PS and .87 for the Culture Innovativeness questionnaire was obtained, which was higher than .7 for all components, and therefore the reliability of the research components was confirmed. The statistical population of the research included some government organizations of Iran and the sample size was calculated using G*power software and the number of people was estimated to be 284. The output of the software is shown in the table below.

Also, fuzzy AHP was used to determine the weight and importance coefficient of the criteria of the 7PS Model.

Table 1. Output of G*power software.

t tests—Linear multiple regression: Fixed model, single regression coefficient								
Analysis: Post hoc: Compute achieved power								
Input				Output				
Tail (s)	Effect size f^2	α err prob	Total sample size	Number of predictors	Noncentrality parameter δ	Critical t	Df	Power (1- β err prob)
One	0.12	0.05	284	1	5.8378078	1.6502750	282	0.9999854

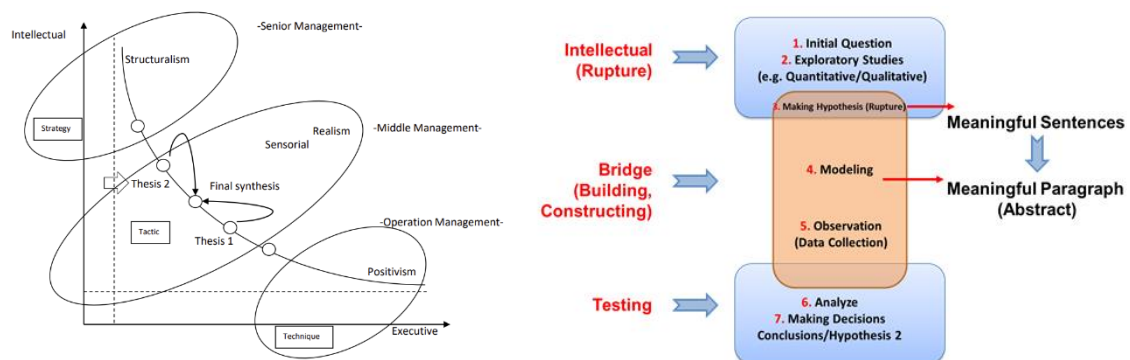


Figure 10. Doost Research Methodology (DRM) and its levels [18].

3.2.3. Step 3

Analyzing and gathering the study results based on literature reviews, case studies, analyses, surveys, Structural Equation Modeling (SEM) and AHP fuzzy, some results were obtained, and these results were analyzed and discussed by the authors.

4. Data analysis and result

Figure 11 shows the conceptual model test of the research.

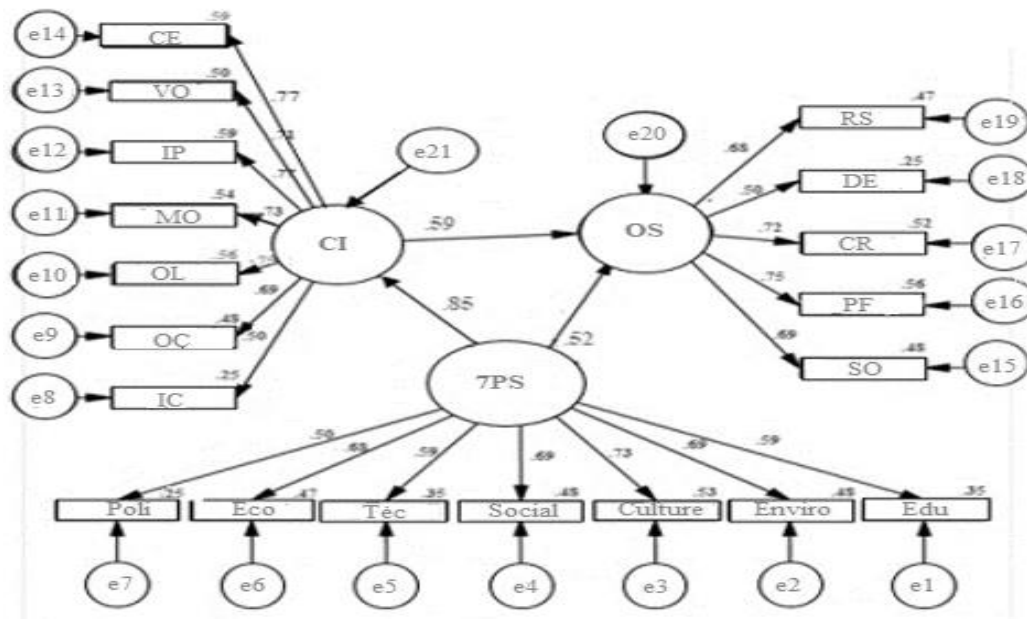


Figure 11. Software output.

Also, to check the Model fitting, in Table 2 were used from Amos software, whose general indices were as shown in the following table.

Table 2. The conceptual model fitting.

RMSE	CFI	IFI	NFI	GFI	P	CIMN/ DF	CIMN
0.0	0.91	0.83	0.93	0.92	0.001	2.58	136.21

Table 3. coefficient of regression and values of partial indicators related to hypotheses.

Hypotheses	Coefficient of regression	critical value	P	Result
H1: The 7Ps has a positive and significant effect on organizational sustainability.	.52	2.16	.001	confirmation
H2: The 7PS has a positive and significant effect on Culture Innovativeness.	.85	2.73	.000	confirmation
H3: Culture Innovativeness has a positive and significant effect on organizational sustainability.	.59	2.21	.008	confirmation

According to Table 2, the value of RMSEA is equal to 0.005. Therefore, this value is less than 0.01, also the value of Chi Squared is 2.58 between 1 and 3, and the amount of GFI, CFI and NFI index is also It is almost equal to and greater than 0.9, which shows that the values of the fit indices are within the acceptable range and therefore, the conceptual model is approved. Based on this, Tables 3 and 4 show the results of research hypotheses.

According to Table 3 and the test of the main hypotheses of the research, it can be seen that the main hypotheses of the research are confirmed at the confidence level of 95%. In the explanation of the test of the main hypotheses, it should be said that according to the critical value of CR, which is more than 1.96 for both hypotheses, and the P value, which is below the error level of 0.05, the hypotheses were confirmed at the confidence level of 95%. Therefore, according to the table above, it can be said that 7PS has a positive and meaningful impact on organizational sustainability and innovation culture at a 95% confidence level. This means that organizational sustainability in government organizations is 52% affected by 7PS. Also, 7PS is 85% effective in the formation of an innovation culture. In addition, the results show that at the 95% confidence level, innovation culture has a positive and significant impact on organizational sustainability. This hypothesis shows that organizational sustainability is 59% affected by innovation culture. After the direct path analysis is done, it is the turn of the bootstrap test to test the indirect path and the mediating variable of the research, and it is shown in the following table:

Table 4. Indirect effects of 7PS on Organization Sustainability via Culture Innovativeness (Bootstrap test for indirect path).

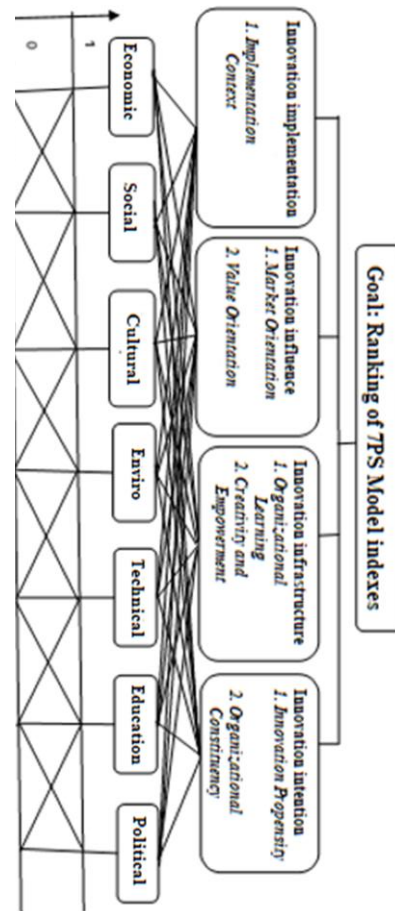
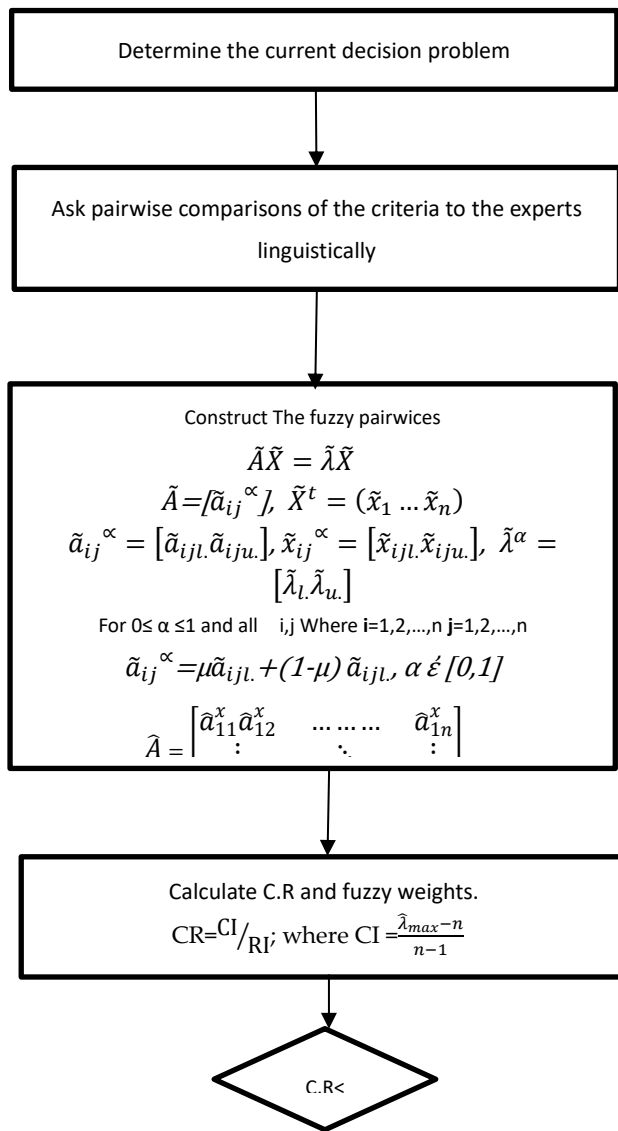
Hypothesis	Route	Bootstrap	Bias	Standard Error	Lower Statistical Limit (LSL)	High Limit (HLER)
H4: Culture Innovativeness plays a mediating role in the impact of the 7PS on organizational sustainability.	7PS / Culture Innovativeness / Organization Sustainability (OS)	.31	.0014	.01157	-.1224	-.0541

The contents of Table 4 for the path of the 7PS Model/innovation culture/organizational sustainability show that its lower limit has a value of -0.1244 and its upper limit has a value of -0.541 . According to the results of the bootstrap test and the absence of zero in this distance, the result indicates the significance of this indirect path, and as a result, the related hypothesis is confirmed. Therefore, according to table 4, it can be said at the 95% confidence level that Culture Innovativeness has a mediating role in the impact of the 7PS Model on organizational sustainability in the public sector.

4.1. Fuzzy AHP (FAHP) and prioritization

Figure 12 shows the steps of fuzzy AHP for ranking the dimensions of 7PS model in summary [41].

Therefore, based on Figure 12, the table 5 shows the prioritization resulting from the matrix of paired comparisons using the fuzzy AHP method for each of the alternatives. In the final ranking, culture has the first priority.



Definition	Fuzzy number
Extremely important	9= (7, 9, 9)
Intermediate value between extremely and very strongly important	8= (6, 8, 9)
Very strongly important	7= (5, 7, 9)
Intermediate value between very strongly and strongly important	6= (4, 6, 8)
Strongly important	5= (3, 5, 7)
Intermediate value between strongly and moderately important	4= (2, 4, 6)
Moderately important	3= (1, 3, 5)
Intermediate value between moderately and equally important	2= (1, 2, 4)
Equally important	1= (1, 1, 3)

Figure 12. Steps Fuzzy AHP.

Table 5. Ranking of 7PS Model indexes.

7PS Model Indicators	Source	Rank
Economic	. 324	4
Social	. 353	3
Environmental	. 382	2
Technical	. 251	5
Cultural	. 481	1
Educational	. 221	6
Political	. 175	7

The figure 13 shows the Seven Pillars of Sustainability (7PS) model with the complexity and connections mentioned above.

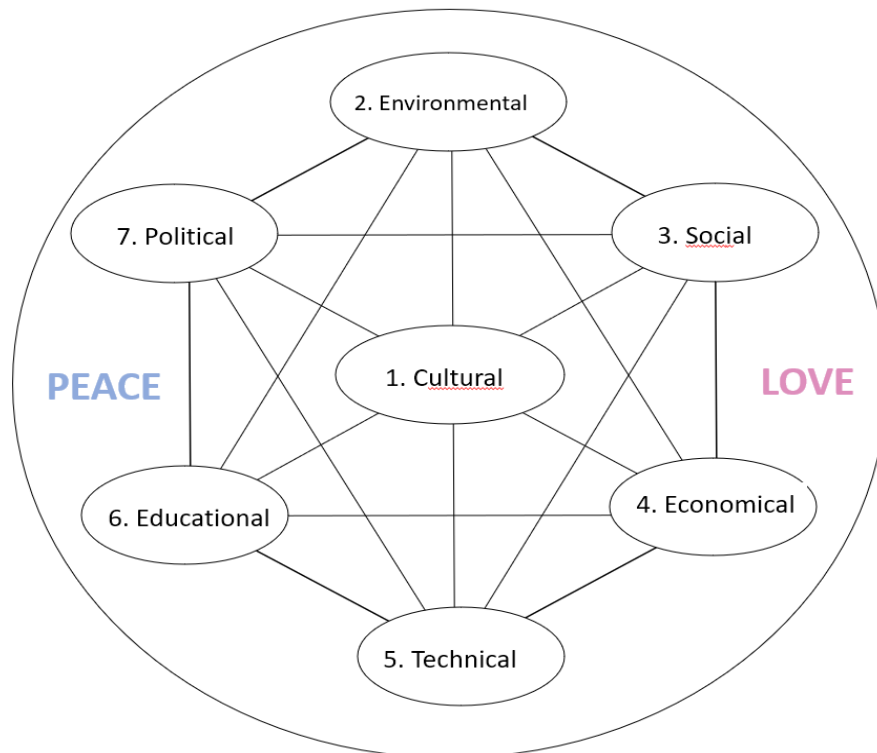


Figure 13. Seven Pillars of Sustainability (7PS) Model with the Priority and Connections [25].

Sustainable development (SD) can be seen as a human effort to establish reconciliation between progress and development and protection of resources in the world. Sustainable development is the result of mainly indigenous activities along with the awareness of each individual about the development situation, which should be the basis of comprehensive and humane development. This type of development has different environmental, economic, social, cultural [42], Technical, Education and sometimes political dimensions that form a sustainable development process in connection with each other.

In the meantime, the cultural dimension as the foundation and infrastructure of this model is very important, because every society and thinking based on its worldview provides a definition for culture. Culture is not an abstract subject and the same width as other affairs of society, but culture is a spiritual space in which a person or society walks. Therefore, the influence of culture in different fields of life and governance, including Tourism, art and architecture, urban planning, development and livability, quality of life, and even industrial products is undeniable [43,44].

After culture, environmental responsibilities came second. In the last few decades, the fear of population growth, consumption growth, lack of facilities, etc., has been the subject of the reflections of many world theorists, and the attention to environmental responsibilities has brought hope in this field. The main components of environmental responsibility are eliminating waste and reducing greenhouse gas emissions, maximizing productivity and efficient energy use, and minimizing practices that may negatively affect the use of natural resources in future generations. Today, an increasing number of companies have realized the importance of environmental initiatives in business

development, and sustainability and carbon footprint reduction are increasingly on the agenda of companies worldwide. In fact, reducing the consumption of energy and raw materials along with reducing greenhouse gas emissions and waste production can solve the environmental challenges facing the world. According to the fifth wave theory, water and air pollution, crises caused by climate change and the collapse of biodiversity are among the most important of these challenges. In other words, clean energy production methods and equipment design with optimal energy consumption are also features of environmental sustainability [31,45].

The crisis caused by social anxiety is an important challenge that highlights the importance of social cohesion after environmental responsibilities in the sustainability model. Social sustainability is one of the concepts related to sustainable development, which was included in the development programs of different countries from the 1960s onwards; But due to the lack of consensus on the components and its place among other components of sustainable development, it has been dealt with in many different ways in practice. Social sustainability refers to the ability of society to preserve and maintain the necessary means of creating wealth and prosperity and social participation to expand integration and cohesion. In fact, social sustainability as a concept seeks to preserve and stabilize the social components of society and link them with other dimensions of sustainable development. In the process of sustainable development, the role of the high potential of social sustainability in achieving goals is very important [46–48]. Therefore, in the strategic goals of sustainable development, the following themes have been widely emphasized [49]:

- *Social welfare by understanding what people need*
- *Managing and identifying business impacts on local communities, customers and employees, workers*
- *Social and occupational security and higher safety in the workplace*
- *Sustainability of products*
- *Empowerment*
- *Increasing power and freedom of choice*
- *Development and expansion of partnership*
- *Improving the quality of life*
- *Institutional capacity building*
- *Being responsible*

In this way, social dimensions in interaction with other dimensions of sustainable development strengthen sustainability and shape its totality.

After social cohesion, the economic dimension is placed in the fourth priority. Today, many national governments and international organizations are compiling their set of indicators for sustainable development. The reason for the need to use sustainability indicators comes from the need to use the concept of sustainable development in practice and evaluate it based on cultural-environmental and social criteria along with economic criteria. Economic development has two main goals: first, increasing the wealth and welfare of the people of the society and eradicating poverty, and second, creating employment, both of these goals are in line with social justice. The view of economic development is different in developed countries and underdeveloped countries. In developed countries, the main goal is to increase people's well-being and facilities, while in backward countries, it is more important to eradicate poverty and increase social justice. The economic dimension oversees how to distribute and use the limited resources needed to improve people's lives. Economic development is a process in which a society reaches a higher stage of economic progress. This process occurs through a

series of changes in economic structures and often social, cultural and political structures. Economic development means growth along with the increase of production capacities including physical, human and social capacities. In economic development, in addition to the Quantitative growth of production, social institutions will also be transformed, attitudes will change, the ability to exploit existing resources will increase continuously and dynamically, and new innovations will be made every day. In addition, it can be said that the composition of production and the relative share of inputs also changes in the production process [30,50].

Technical dimension was placed in the fifth priority. Today, with the advancement of technologies, challenges have arisen that the role of appropriate technology and technological innovations is necessary for the success and sustainability of small and medium enterprises [51]. Based on the results of the EU Erasmus + project IoE-EQ, which Doost, who is the author of this chapter, was an academic leader from Germany, the results of this project showed that the design of the smart application is the most significant advantage to use/develop technological services/solutions in their SMEs and developing new business is the most likely feedback about technological innovation to use IoT technologies in SMEs' energy sector [52].

After the discussion of technical, education is the sixth priority. Education in sustainable development is education through direct and active participation, relying on a holistic approach. The components of such development must be understood and transferred in the form of specific and identifiable entities. On the one hand, this training should include policymakers, decision-makers, planners, designers, and implementers, and on the other hand, it should include those who make development happen (i.e., the people). In today's rapidly changing world, the phenomenon of globalization has pushed all businesses to find a way to survive and win in competition with their competitors and achieve sustainability. Human resources (HR) is an inevitable and cross-sectoral area at the heart of economic activities. They cover several functions: managing employment contracts, developing staff skills, staff jobs and organizing, hiring as well as firing. There is a lot of evidence that shows that education is a key factor in economic prosperity and growth, as well as maintaining a high level of profitability and innovation for companies [12,49]. This means that businesses must take training seriously to protect themselves from today's shocks and tomorrow's crises. At this point in time, most HR professionals oversee training to develop knowledge, attitudes, skills, and values for employees and the development of their companies. They explore how they can positively support lifelong learning efforts towards the SDGs to bring about constructive change.

According to table 5, politics was placed in the seventh priority. It can be acknowledged that in sustainable governance, people participate in the preparation of policies, programs and ethical considerations. Also, the design, regulation and implementation of relevant policies are vital for social and economic well-being without jeopardizing the stability of ecosystems. In fact, sustainable governance is aimed at developing capacities and creating an atmosphere of interaction and dialogue between different elements of society, the business environment and the government, in the direction of improving governance and moving towards blue-green sustainability [13]. In other words, the pillars of sustainable governance (9PSG) are like a strategy in line with the goals of sustainable development. Sustainable governance has significant potential for sustainability and continuity of business operations, modernization of SMEs, business model innovation, new business development, improved public service delivery, addressing complex development needs, and higher quality of life and livability. In this, the role of innovation culture is very fundamental. In fact, sustainable innovative governance to support business plans is a vital driving force in the face of international market pressures and global competition, it also

provides significant opportunities to innovate, strengthen, and improve efficient practices.

This model is covered with an aura of peace and love. In other words, sustainable development relies on peace and love, and peace and love also rely on sustainable development. In fact, it is the right of all human beings to enjoy a satisfying and happy life, and we must create peaceful, decent, inclusive societies free from fear and violence. The sixth society (the future of the fifth society) also refers to the same concept and actually tries to make the earth a better place to live [31].

Therefore, the three technological revolutions (D3) which are (1–) decarbonization, (2–) decentralization and (3–) digitalization could shape the 21st century and high sustainability based on the 7PS model priorities as 1-cultural, 2-environmental, 3-social, 4-economic, 5-educational, 6-technological, and 7-political dimensions.

5. Discussion

Considering the industrial and social implications in times of challenges and crises and making the world a better place to live, the 5th wave theory forces SMEs to achieve sustainability in order to prepare for future concerns at the edge of tomorrow. (2020–2030) [17].

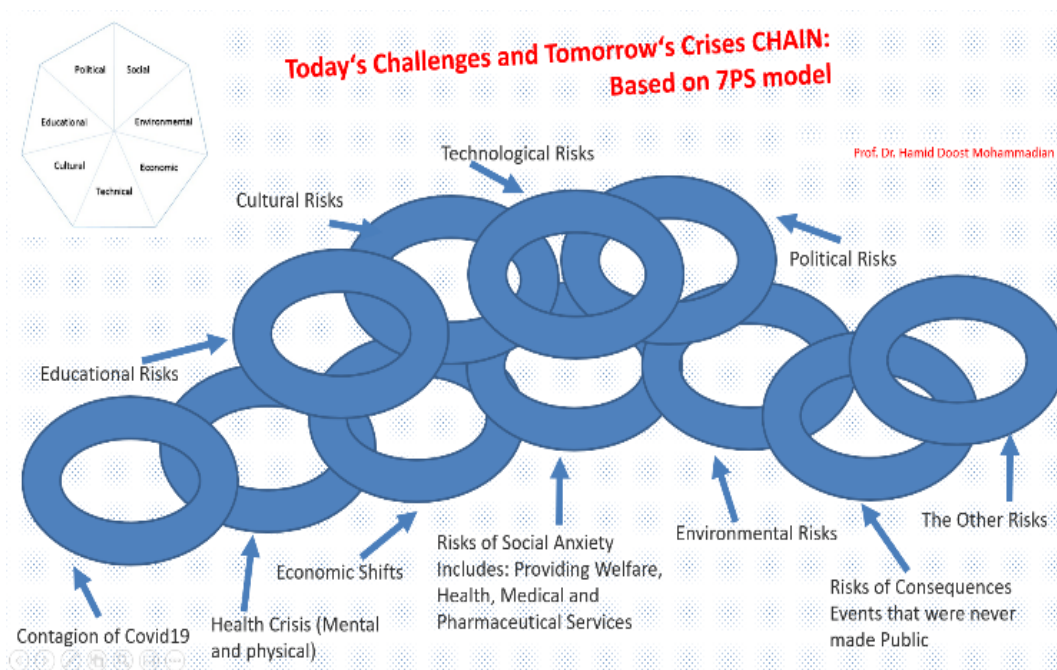


Figure 14. Tomorrow's Crises Chain at the Edge of Tomorrow [12].

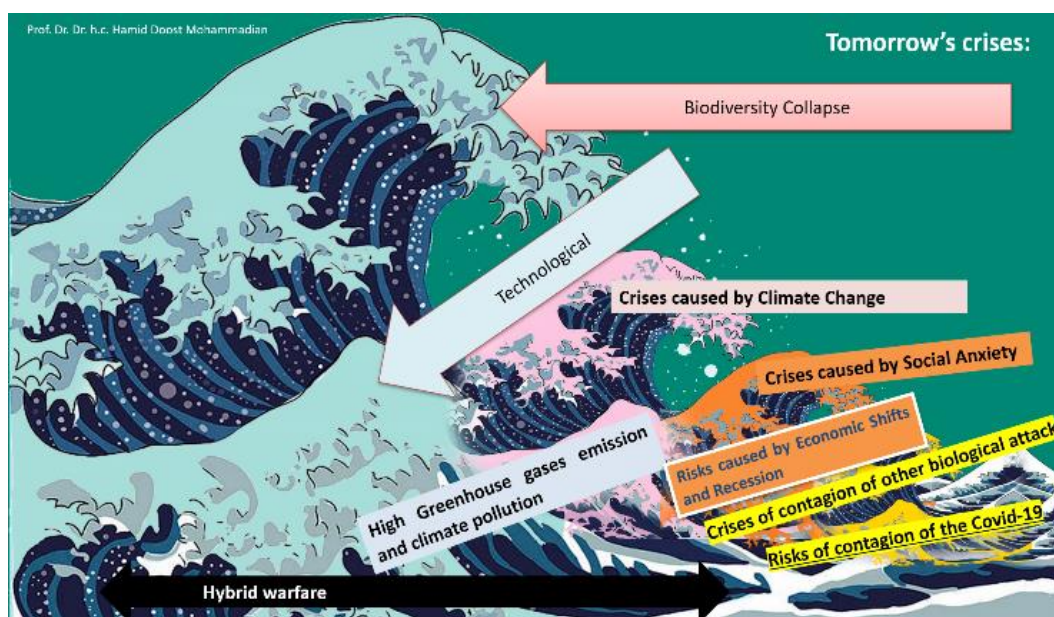


Figure 15. Tomorrow's Crises Waves at the Edge of Tomorrow [12].

The world we live in is advancing in technology and has reached a new stage of evolution and innovation called the 4th industrial revolution. According to some authors, the future of the 4th industrial revolution (Industry 5.0) is the most powerful driver of innovation in the next few decades, beginning the next wave of innovation. In the midst of this competition, SMEs which are an important part of businesses, have no choice but to respond quickly to their changing environment. Meanwhile, requiring employees to upgrade their skills and competencies doubles the importance of training [12].

Thus, the rapid digitalization of the business world is breaking down traditional barriers to industry, and many academics and practitioners are emphasizing the need to revise existing business models. Today, new communication technologies have given so much speed and depth to social change that it has penetrated even the most enduring area of human life, namely culture, and has placed societies in the midst of a serious cultural transformation. The cultural vision and integration of the future of the 4th industry SMEs as a symbol of Western culture and the future of Society 5.0 (Society 6.0) as a symbol of non-Western culture is the basis of governance policymaking for industry and technology. And since SMEs are always faced with natural and unnatural crises, they must seek solutions to control these crises that control or minimize the damage expected of each of these crises. The global outbreak of the new coronavirus as a pandemic disease has created one of the most critical conditions for businesses. Therefore, it is necessary for businesses to be prepared for tomorrow's shocks so that they can: first predict, then prevent, and finally face the crisis. Or be destroyed [17]!

Due to the constraints created by the corona, many businesses in various industries are at risk. The question is, how can the corona threat be turned into an opportunity in such a situation? How should SMEs survive and use the current situation to increase their level of competition? Is the corona a threat or an opportunity? Professor Dr. Hamid Doost Mohammadian describes the Coronavirus as a super accelerator in his book (the 5th wave theory). Basically, each phenomenon can be expected to have two different perceptions and two different results. A review of past crises shows that after overcoming global epidemics, many smart businesses have been able to easily change their business model, create better conditions for themselves than before the crisis, and turn their business into a

successful business. The important point in turning a threat into an opportunity and using it is to change your perspective, insight, thinking and turning to education, creative and innovative thinking in any field of work. Flexible businesses that can react quickly and appropriately in such situations will also find favorable conditions after the crisis. In other words, perhaps if the Corona crisis had occurred before the present century, there would have been more dangers, but nowadays, with the advancement of high technologies such as the Internet of Things, the speed of technologies in the field of education has increased. As a result, training businesses are able to provide high-quality, low-cost online services and be more successful, despite challenges such as Corona [53].

Figure 16 shows the Global SMEs’ Challenges and Solutions.

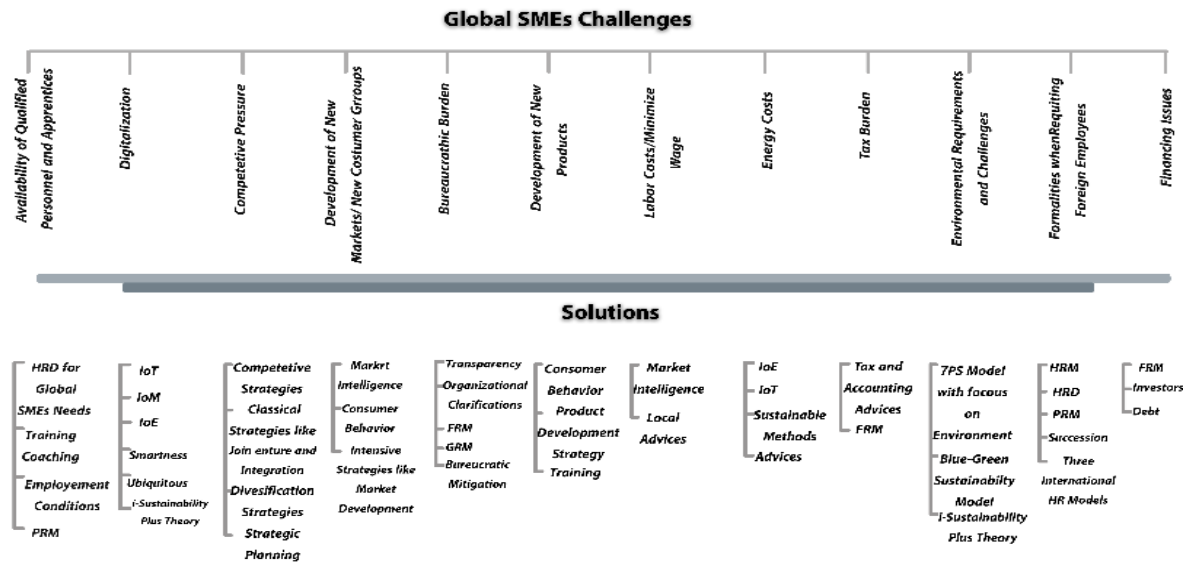


Figure 16. Global SMEs’ Challenges and Solutions [30].

According to Professor Doost’s the 5th wave theory, Corona as a challenge has positive consequences and as a SUPER ACCELERATOR can increase the speed of technologies in education (Education 5.0) and SMEs. In this regard, the need to pay attention to the role of education in various social economic, environmental, etc. in the corona is felt in all global systems, especially SMEs. Businesses that emphasized education in times of crisis learned the knowledge, values, perspectives, and capabilities necessary for survival and took effective steps in the field of social justice and environmental and economic issues. In the early days of the Pandemic, for example, many leaders quickly realized that their company’s digital capabilities determined their ability to adapt to changing circumstances. This awareness has accelerated the approval of digitization plans, both among employees and customers [54,55].

Therefore, the following can be noted:

- Business digitalization through the digitization of core business operations or processes.
- business virtualization through the addition of digital products or services.
- Business flexibility by increasing the share of telecommuting and s contingent workers;
- Employee-centric businesses through the development of employee health, safety and welfare programs.
- Business sustainability through carbon reduction and...
- Finally, it can be acknowledged that this super accelerator highlights the concept of SME 5.0 and emphasizes Hybrid Edu SMEs.

5.1. Tomorrow's SMEs (SMEs 5.0/Hybrid SMEs)

The situation became so critical in the world economies during the Covid-19 pandemic that many governments faced an important dilemma. In fact, the quarantine and closure of businesses continued for some time in order to make a smaller part of the population infected with Covid-19. Therefore, in times of shocks such as the Coronavirus, the challenge faced by government decision-makers is that if the industry and private sectors are shut down, the economy will enter a recession and permanent damage will be done to it. On the other hand, not taking this decision will make the situation worse, which will cause the continuation of the crisis and, as a result, its harmful economic consequences. The idea of tomorrow's SMEs from Doost Mohammadian based on the theory of the fifth wave refers to hybrid SMEs that can be the auxiliary arm and mastermind of the executive part of governance. They should be the right custodians to implement the job preparation plan, vocational training, entrepreneurship, marketing and creating a business environment. Today, in addition to the economy, SMEs play an important role in the stability and social welfare of a country. One of the main common meanings realized by the OECD for SMEs is defined as: independent and non-subsidiary companies with up to 249 employees and a specific annual turnover of about 10 to 50 million related to the size of the workforce. In addition, global SMEs are SMEs that not only operate at the national level, but also participate in international trade. In other words, Tomorrow's SMEs will lead the governances towards Sustainable Global Innovative Smart Governance. In these businesses, in relationships with customers, employees, and suppliers, priority and originality with environmental responsibility and a social dimension are important, and economy and business are next important. Also, the activities of the industry in the formation of common ecosystems to meet the needs of the environment and society without jeopardizing the needs of future generations are based on creating markets for competition. In this regard, government strategies play a key role in creating strong incentives for the environmental and social responsibility of companies. In fact, environmental and social responsibility approaches in smart organizations are less and more efficient use of resources, 360-degree transparency and accountability, creating better work experiences for employees, platform and service-oriented entrepreneurship, moving from CSR (Corporate Social Responsibility) to CSE (Corporate Startup Engagement) and etc. [12,13,17,55].

It is expected that influential businesses in the country's economy, as part of promoting their brand, will play an important role in terms of environmental and social responsibility.

Tomorrow's SMEs have 2 wings which are environmentally friendly and social responsibility and also business and economy in addition Hybrid SMEs have 14 points which are given in figure 17 and 18 Hybrid SMEs and these points:

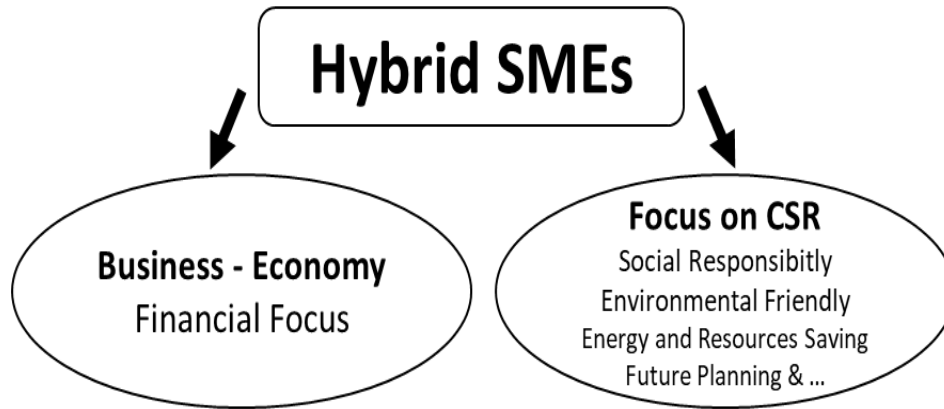


Figure 17. Hybrid SMEs’ 2 wings [54].



Figure 18. Hybrid SMEs/SMEs 5.0 are/have 14 points [12].

6. Limitations, recommendations, conclusions and future suggestions

According to the above, the 7PS sustainability pillars, the 9PSG model for sustainable governance, and smartness play a major role in the source of innovation and sustainability of business models. In the digital age, sustainability governance structures that align with and complement the existing business model and organizational structures can be more successful than creating redundant or competing structures. The 9PSG model is an example of best practice in forming sustainability governance structure and Promoting Sustainable Global Innovative Smart Governance. The 9PSG model Due to the techno-logical and innovative features of the present age and challenges and crises

with focusing on quality of life, creates sustainability in the dimensions (political, educational, environmental, social, economic, technological and cultural). Developing sustainability governance structures may take time, but it can help ensure the successful management of ESG (Environment, social, governance) issues. In fact, creating a strong response such as innovation maintains business sustainability and protects people and assets. In other words, sustainable innovative digital transformation requires a cultural change by moving from a traditional mindset to a digital mindset, the innovative culture, innovation, and customer proximity, and digital is institutionalized in the minds of individuals.

Here are a few things in brief:

➤ *Promoting Sustainable Global Innovative Smart Governance reflects the next generation of economic development thinking and moves society towards clean technology, green economy and clean business.*

➤ *Promoting Sustainable Global Innovative Smart Governance deals with the identification of environmental threats as well as innovation to eliminate threats and turn them into opportunities.*

➤ *System building in sustainable innovation includes cooperation with others; All stakeholders and even competitors are to create positive environmental effects as well as see themselves as part of a larger ecosystem and do the right thing by doing new things in collaboration with others.*

➤ *A sustainable business is a business that has minimal negative and even positive environmental effects of the global community, local community, economy, and all stakeholders. Because sustainable business tries to achieve triple benefits.*

➤ *Also, sustainable innovation requires systemic thinking, and companies committed to sustainable innovation see themselves as part of a large ecosystem (a system made up of countless stakeholders) and do not focus only on their organizational boundaries. Therefore, sustainable innovation should be in the culture of an organization.*

Researchers face limitations in their research, some of which are general and others specific to each researcher. The most important limitation in this research was the lack of resources and research conducted in the field of sustainability management in Iran and the lack of resources and research conducted in the field of digital innovation in organizations, especially government organizations.

To achieve sustainable innovation, different organizational capabilities are needed. According to the conducted research, it is recommended that companies and enterprises have a documented plan and contribute to the success of the enterprise by bringing environmental and social, cultural, educational, strategic and technological dimensions in their mission.

➤ *In the political dimension, in the way of achieving stability conditions, and especially in the transition period, governments have been assigned extensive tasks. They are obliged to observe the components of sustainable development at all levels of programs and policies. In this context, policymakers in every country should develop policy solutions that are effective in solving the problem and gain sufficient support from the stakeholders, which include regulatory policies and incentive and support policies of governments in the formation of sustainable innovative governance.; which can be followed by sustainability in businesses. In general, governments are able to, directly and indirectly, help the mobility of the private sector in this field by creating favorable conditions.*

➤ *In the economic aspect, it can be said; One of the main factors that encourage companies to adopt an environmentally friendly position in their business approaches is the potential success in obtaining economic advantages. Economic advantage is the result of a dynamic and continuous process that originates from the organization's resources, taking into account internal and external*

situations. Also, due to the ability to use these resources correctly, there are capabilities that bring economic and competitive advantages, such as improving productivity, increasing market share, and reaching new markets for the organization.

➤ *In the cultural dimension, it should be said: culture, as one of the determining factors, affects all dimensions of human life, and people's opinions, beliefs, behaviors, manners, and customs are affected by the cultural framework and fabric of the society. It must be admitted that the formation of sustainable innovation in companies is more possible under the shadow of the development of green public culture. The cooperation of the family institution, religious institutions, educational institutions in the field of environmental and social, scientific, political, economic and technological issues will lead to the improvement of the general culture of the people, and as a result, the society will move in the direction of sustainable development.*

➤ *In the educational aspect, it should be mentioned: Today, knowledge is available to economic enterprises as a vital resource, and by participating in various production and service processes, it increases competitive advantage and creates added value. Therefore, it can be concluded that with education and knowledge acquisition, its integration and application, it is possible to have satisfactory economic, social and environmental performance. The movement and continuity and acceleration of companies in the direction of training and acquiring the knowledge they need is an essential key to achieving sustainable innovation. In general, the knowledge bases of sustainable innovation can be suppliers, competitors, non-governmental organizations, as well as governmental and non-governmental universities and research institutions.*

➤ *Regarding environmental responsibilities, it is worth mentioning that: Today, the increase in customer awareness of environmental issues and their attention to this area has made them play a decisive and important role in improving the response to environmental issues in the industry. Therefore, many of the actions and green innovations of the companies are in order to respond to the pressures from the consumers, suppliers and competitors on the companies in order to apply sustainable digital innovations.*

➤ *In the social aspect, it can be said: the media, social movements and mass demonstrations, and people's organizations, as tools of applying pressure in greening the performance of companies, play an important role.*

The results of this study emphasized the need for the role of smartness, AI, Neural Networks, machine learning, and the Internet of Things (IoT), as well as the innovative culture in promoting sustainability, and expressed strategies to promote the sustainability of business models in sustainable global innovative smart governance.

Some recommendations for moving organizations toward sustainable innovation:

➤ *For sustainable innovation in production, it is recommended that innovation be used to increase the efficiency of energy consumption during the production process for the purpose of energy awareness, as well as innovation for the minimal use of fossil fuels and the maximum use of renewable energies in the production process to follow the approach of green production.*

➤ *Innovation to increase the efficiency of energy consumption in the product; Innovations related to product reuse or recycling; Use of renewable, used and recycled materials in the product; Reducing or eliminating the use of dangerous and toxic substances in the product and innovation in sustainable packaging or packaging using recycled and renewable materials are ways to achieve sustainable innovation in the product.*

Conflict of interest

The authors declare no conflict of interest.

References

1. Tang M, Walsh G, Lerner D, et al. (2018) Green innovation, managerial concern and firm performance: an empirical study. *Bus Strat Environ* 27: 39–51. <https://doi.org/10.1002/bse.1981>
2. Gürlek M, Tuna M (2018) Reinforcing competitive advantage through green organizational culture and green innovation. *Serv Ind J* 38: 467–491. <https://doi.org/10.1080/02642069.2017.1402889>
3. Chu Z, Wang L, Lai F (2019) Customer pressure and green innovations at third party logistics providers in China: the moderation effect of organizational culture. *Int J Logist Manag* 30: 57–75. <https://doi.org/10.1108/IJLM-11-2017-0294>
4. Mothe C, Nguyen-Thi UT, Triguero A (2017) Innovative products and services with environmental benefits: design of search strategies for external knowledge and absorptive capacity. *J Environ Plan Manag* 61: 1934–1954. <https://doi.org/10.1080/09640568.2017.1372275>
5. Marzucchi A, Montresor S (2017) Forms of Knowledge and Eco-Innovation Modes: Evidence from Spanish Manufacturing Firms. *Ecol Econ* 131: 208–221. <https://doi.org/10.1016/j.ecolecon.2016.08.032>
6. Abbas J, Sağsan M (2019) Impact of knowledge management practices on green innovation and corporate sustainable development: A structural analysis. *J Cleaner Prod* 229: 611–620. <https://doi.org/10.1016/j.jclepro.2019.05.024>
7. Choi J, Park BI (2014) Environmentally responsible management of MNE subsidiaries: Stakeholder perspective. *Multinatl Bus Rev* 22: 59–77. <https://doi.org/10.1108/MBR-06-2013-0034>
8. Kawai N, Strange R, Zucchella A (2018) Stakeholder pressures, EMS implementation, and green innovation in MNC overseas subsidiaries. *Int Bus Rev* 27: 933–946. <https://doi.org/10.1016/j.ibusrev.2018.02.004>
9. Nilsson F, Göransson M (2021) Critical factors for the realization of sustainable supply chain innovations—Model development based on a systematic literature review. *J Cleaner Prod* 296: 126471. <https://doi.org/10.1016/j.jclepro.2021.126471>
10. Fang Z, Kong X, Sensoy A, et al. (2021) Government’s awareness of Environmental protection and corporate green innovation: A natural experiment from the new environmental protection law in China. *Econ Anal Policy* 70: 294–312. <https://doi.org/10.1016/j.eap.2021.03.003>
11. Kneipp JM, Gomes CM, Bichueti RS, et al. (2019) Sustainable innovation practices and their relationship with the performance of industrial companies. *Revista de Gestão* 26: 94–111. <https://doi.org/10.1108/REGE-01-2018-0005>
12. Doost Mohammadian H, Langari Z, Castro M, et al. (2022) Smart Governance for Educational Sustainability: Hybrid SMEs & the 5 th wave theory Towards Mapping the Future Education in Post-Covid Era. *2022 IEEE Global Eng Educ Conf*, 1916–1926. <https://doi.org/10.1109/EDUCON52537.2022.9766580>
13. Doost Mohammadian H, Langari Z, Wittberg V (2022) Cyber Government for Sustainable Governance: Examining Solutions to Tomorrow’s Crises and Implications through the 5th wave theory, Edu 5.0 concept, and 9PSG model. *2022 IEEE Global Eng Educ Conf*, 1737–1746. <https://doi.org/10.1109/EDUCON52537.2022.9766774>

14. Dhaoui I (2019) Good governance for sustainable development. *MPRA Paper*, UTC. Available from: <https://mpra.ub.uni-muenchen.de/92544/>.
15. Sajadi J, Yarmoradi K, Kanooni R, et al. (2017) The Role of Good Governance in Improving the quality of Urban Environment from the Perspective of Residents, Case Study: Bagh Ferdows Neighborhood in Zone 1 of Tehran. *J Urban Ecol Res* 8: 97–110.
16. Lopatkova Y, Agbozo E, Belyaeva Z (2019) EXPLORING THE RELATIONSHIP BETWEEN E-GOVERNMENT AND SUSTAINABLE DEVELOPMENT. *XIV Int Conf Russ Reg Focus Changes*, 80–88.
17. Doost Mohammadian H, Rezaie F (2020) The role of IoE—Education in the 5th wave theory readiness & its effect on SME 4.0 HR competencies. *Proc 2020 IEEE Global Eng Educ Conf*. Porto, Portugal, 27–30. <https://doi.org/10.1109/EDUCON45650.2020.9125249>
18. Doost Mohammadian H, Rezaie F (2020) i-sustainability plus theory as an innovative path towards sustainable world founded on blue-green ubiquitous cities (case studies: Denmark and South Korea). *Inventions* 5: 14. <https://doi.org/10.3390/inventions5020014>
19. Buscher V, Doody L, Webb M, et al. (2014) *Urban Mobility in the Smart City Age*; Smart Cities Cornerstone Series; Schneider Electric. London, UK.
20. Doost Mohammadian H (2018) Internet of Education: A Solution for Improving the Efficiency of Reversible Education. *Proc IEEE Global Eng Educ Conf*. 17–20.
21. Parrilli M, Balavac M, Radicic D (2020) Business innovation modes and their impact on innovation outputs: Regional variations and the nature of innovation across EU regions. *Res Policy* 49:104047. <https://doi.org/10.1016/j.respol.2020.104047>
22. Doost Mohammadian H (2019) IoT—a Solution for Educational Management Challenges. *Proc 9 IEEE Global Eng Educ Conf*, 8–11.
23. International Chamber of Commerce, ICC Calls for Urgent Action to “Save Our Smes”, 2020. Available from: <https://iccwbo.org/media-wall/news-speeches/icc-calls-for-urgent-action-to-save-our-smes/>.
24. Doost Mohammadian H, Rezaie F(2019) Sustainable Innovative Project Management: Response to Improve Livability and Quality of Life: Case Studies: Iran and Germany. *Inventions* 4: 59. <https://doi.org/10.3390/inventions4040059>
25. Doost Mohammadian H (2022) Mapping the Future Sustainable, through the Theory of Comprehensive Everything or the 5 th Wave/Tomorrow Age Theory, with a focus on Hybrid SMEs/SME 5.0 Educationally. *2022 IEEE Global Eng Educ Conf*, 1747–1761.
26. OECD (2021) *Education Policy Outlook: Shaping Responsive and Resilient Education in a Changing World*, Paris. <https://doi.org/10.1787/75e40a16-en>
27. Eivazi M, Salehi M, Marzban N (2016) From the study of good governance to the model of sustainable governance. *Strategy Quarterly* 26: 55–85.
28. Suklabaidya S, Sen A (2013) Challenges and Prospects of E-governance in Education. *Int J Emerging Trends Technol Comput Sci* 2: 258–262.
29. Doost Mohammadian H (2020) IoT-Education technologies as solutions towards SMEs’ educational challenges and I4.0 readiness. *Proc 2020 IEEE Global Eng Educ Conf*, 27–30.
30. Doost Mohammadian H (2020) The 5th Wave and i-Sustainability Plus Theories as Solutions for SocioEdu Consequences of Covid-19. *IEEE Learning MOOCS*.
31. Doost Mohammadian H, Rezaie F (2020) Blue-Green Smart Mobility Technologies as Readiness for Facing Tomorrow’s Urban Shock toward the World as a Better Place for Living (Case Studies: Songdo and Copenhagen). *Technologies* 8: 39. <https://doi.org/10.3390/technologies8030039>

32. Prud'homme van Reine P (2013) Creating cultures of sustainable innovation. *J Innovation Manage* 1: 85–107. https://doi.org/10.24840/2183-0606_001.001_0007
33. Dobni C (2008) Measuring innovation culture in organizations: The development of a generalized innovation culture construct using exploratory factor analysis. *Eur J Innovation Manage* 11: 539–559. <https://doi.org/10.1108/14601060810911156>
34. Kamarudin M, Zuraidah A, Shamsuri A (2014) Penilaian Budaya Inovasi Kementerian Pengajian Tinggi Malaysia.
35. Kalyani M (2011) Innovative culture: an intervention strategy for sustainable growth in changing scenario. *Int J Bus Adm* 2: 84–92.
36. Christensen Clayton M, Raynor Michael E (2003) *The Innovator's Solution: Creating and Sustaining Successful Growth*. Boston, Harvard Business School Press, 304.
37. Dommerholt E, Soltanifar M, Bessant J (2021) Impact of sustainable innovation on organizational performance, *Sustainable Innovation*, 1st Edition, Routledge, 213–228.
38. Hassi L, Peck D, Dewulf K, et al. (2009) Sustainable Innovation, Organization and Goal Finding. *Jt Actions Clim Change*, 1–25.
39. Afraze A, Mohammadnabi S, Mohammadnabi S (2010) The model of measuring and improving the degree of organizational sustainability with the approach of knowledge management. *Manage Stud* 20: 37–63.
40. Weick K, Sutcliffe K (2008) *Managing the unexpected: resilient performance in an age of uncertainty*, Second Edition, Inc. San Francisco.
41. Mardani A, Zavadskas E, Streimikiene D, et al. (2016) Using fuzzy multiple criteria decision-making approaches for evaluating energy saving technologies and solutions in five-star hotels: A new hierarchical framework. *Energy* 117: 131–148. <https://doi.org/10.1016/j.energy.2016.10.076>
42. Shi LY, Han LW, Yang FM, et al. (2019) The Evolution of Sustainable Development Theory: Types, Goals, and Research Prospects. *Sustainability* 11: 7158. <https://doi.org/10.3390/su11247158>
43. Doost Mohammadian H (2017) *An Overview of International Cross-Cultural Management*. Fachhochschule des Mitt elstands GmbH, Bielefeld. Germany.
44. Duxbury N, Hosagrahar J, Pascual J (2016) *Why must culture be at the heart of sustainable urban development?* United cities and local governments.
45. Dobson A (2007) Environmental citizenship: Towards sustainable development. *Sustainable Dev* 15: 276–285. <https://doi.org/10.1002/sd.344>
46. Camilleri M (2022) Strategic attributions of corporate social responsibility and environmental management: The business case for doing well by doing good! *Sustainable Dev* 30: 409–422. <https://doi.org/10.1002/sd.2256>
47. Eizenberg E, Jabareen Y (2017) Social sustainability: A new conceptual framework. *Sustainability* 9: 68. <https://doi.org/10.3390/su9010068>
48. Dempsey N, Bramley G, Power S, et al. (2011) The social dimension of sustainable development: Defining urban social sustainability. *Sustainable Dev* 19: 289–300. <https://doi.org/10.1002/sd.417>
49. Doost Mohammadian H (2019) International Project Management: A Focus on HR Approach in Multinational Corporations.
50. Spangenberg J (2004) Reconciling sustainability and growth: criteria, indicators, policies. *Sustainable Dev* 12: 74–86. <https://doi.org/10.1002/sd.229>
51. Xiong J, Qureshi S (2015) Information technology for development in small and medium-sized enterprises. Available from: <https://aisel.aisnet.org/globdev2015/7>
52. Doost Mohammadian H (2021) Education 5.0 & Educational Sustainability through the 5th Wave Theory—Cases: MODE-IT and IoE—EQ. *FHM Univ London Inst Skill Dev*.

53. Doost Mohammadian H, Rezaie F (2020) Global SMEs; Volume 1 Sustainable Smart Innovative Global SMEs. *FHM—Univ Appl Sci Bielefeld*.
54. Doost Mohammadian H, Bakhtiari A, Castro M, et al. (2022) The Development of a Readiness Assessment Framework for Tomorrow's SMEs/SME 5.0 for Adopting the Educational Components of future of I4. 0. *2022 IEEE Global Eng Educ Conf*, 1699–1708. <https://doi.org/10.1109/EDUCON52537.2022.9766609>
55. Doost Mohammadian H (2019) International Project Management: A Focus on Value Engineering and Project Value Improvement.



AIMS Press

© 2023 the Author(s), licensee AIMS Press. This is an open access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>)