

# A model for sustainable innovation in hospital design

Mohammad Bagher Khosravi, Neda Nafari\*, Nader Sheikholeslami Kandelousi, Zahra Alipour Darvishi

*Department of Public Administration, North Tehran Branch, Islamic Azad University, Tehran, Iran*

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## Abstract

The rapid advancements in healthcare and the increasing demand for high-quality healthcare services have placed significant pressure on hospital facilities. The complexity of healthcare systems requires continuous innovation to meet the ever-changing needs of patients and healthcare providers. A comprehensive model grounded in the Grounded Theory is proposed to address the challenges and complexities of innovation in hospital design. This model aims to facilitate innovation in hospital design and operations while ensuring sustainability. In this study, qualitative data were collected through interviews with key stakeholders in hospital design and management. The data were analyzed using grounded theory methodology to develop a model for innovation in hospital design. The process of data collection and analysis was not two consecutive processes but was carried out in a zigzag and simultaneous manner, which is the nature of theoretical sampling. By analyzing the interviews line by line, open coding was done. Based on the identified open codes, central codes were formed and a theoretical model was developed with the help of selective coding. Finally, the paradigm model was approved by the opinion of experts. The results indicate that in the context of innovation in hospital design, key factors include leadership and management, interdisciplinary collaboration, stakeholder engagement, and the integration of technology and evidence-based practices. These factors, along with a focus on patient-centred care, lead to the emergence of innovative solutions and sustainable practices in hospital design.

Keywords: grounded theory, crisis, hospital, innovation, sustainable innovation  
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## 1 Introduction

According to the report of the World Environment Organization, the production of greenhouse gases is expected to increase over time; In the United States, the emission of greenhouse gases has increased by more than 30% in the last decade. Therefore, due to the increasing importance of environmental regulations and criteria in a very dynamic and complex competition, many organizations act to improve performance results about society as a whole [13]. Therefore, sustainable development is defined as a way to develop which currently does not jeopardize the chance of development for future generations. As a structure, it includes energy, environment and human resources components [11] it can be said, that sustainability is the idea of saving, the appropriate long-term balance between financial, social and ecological goals in the name of future generations, limits our material comfort [1].

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\*Corresponding author

*Email addresses:* [khosravy.m60@gmail.com](mailto:khosravy.m60@gmail.com) (Mohammad Bagher Khosravi), [n-nafari@iau-tnb.ac.ir](mailto:n-nafari@iau-tnb.ac.ir) (Neda Nafari), [n\\_sheikholeslami@iau-tnb.ac.ir](mailto:n_sheikholeslami@iau-tnb.ac.ir) (Nader Sheikholeslami Kandelousi), [z\\_alipour@iau-tnb.ac.ir](mailto:z_alipour@iau-tnb.ac.ir) (Zahra Alipour Darvishi)

The discussion about sustainable development requires a closer look at the question of how to achieve this broad transition to a new global paradigm. The world and our global society need a change towards a more responsible treatment of human, social and economic capital. For this reason, new ideas and innovations must be created [11].

In the last two decades, innovation has become an attractive field for researchers who try to define, categorize and investigate its impact on the performance of organizations, especially because of its practical relevance [11]. A sustainable innovation, such as a sustainable livelihood, preserves or increases local and global assets, and on the other hand, the net benefits of sustainable innovation pay attention to other means of livelihood, coping and recovery from stress and shocks of future generations [6] Hence, it can be seen Kurd said that innovation is a way to achieve sustainable economic growth of organizations and society [10].

It is argued that in the global economic system and increasing competition, creativity and innovation are key factors for the survival and success of organizations. The performance of innovation is a combination of the successes of the entire organization, which results from the efforts made to renew, improve and apply different aspects of innovation in the organization [13]. Many research areas can indirectly contribute to improving sustainability. But in the health sector, demand for health services can be reduced through measures that confer health and environmental benefits [12] Understanding the energy consumption and emissions associated with health services not only to identify opportunities to minimize the environmental impact of these services It is important, but it is also important to facilitate their adaptation to reducing greenhouse gas emissions, managing energy consumption and vice versa. This is a win-win proposition. Agreements and summits seek to establish environmental goals for countries and encourage the entire business sector, including hospitals, to adopt green measures, improve their environmental performance, and choose more sustainable options [13].

Health services are valuable resources that have seen significant changes in the last few decades. These changes include the management of high development costs to increase quality standards and the realization of legal dimensions (environmental and social) [8] There is no doubt about the fact that in the second half of the 20th century, humans have engaged with an ecosystem that has not been studied before. Climate change, chemical pollution and the use of unsustainable resources are all contributing to the aggravation of disease worldwide. These environmental health problems add increasing pressure and erode the capacity of health care systems [3] thus sustainability is especially important for hospitals. Because it mainly acts to meet social needs and prevent environmental and health risks [8].

It should be kept in mind that the deteriorating health of our environment is a painful reality, a serious and important international issue. Because it has a direct impact on human health, but the sad irony is that the health sector itself plays an important role in creating climate change. The healthcare sector operates in an environment similar to any other industry, an environment that sustains billions of people. It affects and in turn, is affected by this environment [3]. Hospitals are very complex structures that require large investments. These structures must have high standards and must be competitive. In order to sustainably compete in the hospital and meet the expectations of patients by improving capabilities, a hospital must innovate [9].

It can be stated that hospitals all over the world strive to introduce innovation in patient care and maintain high quality standards. To implement these innovations, hospitals affect the natural environment. Therefore, to minimize harm to patients and surrounding communities, hospital managers adopt environmental management programs in the field of energy conservation, proper disposal of waste, and safe management of drugs, which have been introduced as a green hospital [15] as a result of understanding innovations in services. In hospital environments, it requires a comprehensive analysis of the hospital organization in all its aspects, that is, it should not be limited to those activities related to medical activities, but should also be related to organizational support and operations such as rehabilitation, reception, hospitality, nutrition and communication [4].

When hospitals are taken into consideration, due to the demands of informed customers now and the implementation of health standards, the services must be qualified, reliable and in a way to meet the needs. This compulsion creates continuous innovation in health programs. To achieve this, sustainable innovation means “collective commitment to the future through responsible supervision of science and innovation in the present”. Until today, little research has been done about sustainable innovation in healthcare centers, that’s why the current research tries to address this issue.

## 2 Research background

Khonje et al. conducted a study examining the existence and application of innovative sustainable environmental practices in Malawian hotels. They acknowledged that collaborative efforts between the government and the private sector, along with the implementation of sustainability policies to promote environmentally sustainable innovation, are

essential. They also demonstrated a strong relationship between resource conservation innovation in accommodation facilities and cost savings [5].

Meier and colleagues conducted research in the field of product innovation in the context of current sustainability requirements to identify the correlation between sustainable development and product innovation. The research results indicated a correlation between the success of product innovation and the sustainable development of an organization [11].

In another study, Lehoux et al. challenged the sustainability of healthcare systems in several countries by examining new medical technologies. They found that innovation in medical technology has been on a path of commercialization since the 1950s, exacerbating the challenges of sustainability in healthcare systems. They concluded that a responsible and sustainable approach to innovation in healthcare is necessary, and sustainability can help preserve healthcare systems [7].

Sibthorpe et al. allocated primary healthcare innovation sustainability to six domains (political, institutional, financial, economic, customer, and workforce) as a result of their comprehensive analysis of five studies. These domains included the importance of social relationships, networks, and champions, the influence of political, economic, and social forces, and the motivation and capacity of internal system factors [16]. In a study aimed at examining the role of innovation strategy in Tanzania's tourism industry's economic sustainability, Nijoroge et al. found that innovation strategy emphasizes standard services, service quality, product readiness, and ultimately, technology application. Innovation strategy is positively associated with economic sustainability performance in the industry [14]. Lopez and colleagues presented a model in their research titled "Business Models and Innovation Outlook for Sustainability Transfer in Hospitals" to discuss issues arising from business models, innovation, and sustainability transfer from the perspective of hospitals. They highlight elements that hospitals are dependent on [16].

### 3 Research methodology

The current research method was based on qualitative interview data and quantitative Delphi questionnaire (to verify the validity of the extracted codes) in terms of the applied objective. Therefore, the current research was a mixed research.

#### 3.1 Research findings

#### 3.2 Society and research sample size

The panel of experts will be used in the first part, which is the identification of factors, and the second part, which is the Delphi method for data validation. Experts have been selected in this research, innovation experts in hospitals, among whom 12 people will be randomly selected. In this section, sampling was done by snowball method.

Carrying out the three processes of open coding, central coding and selective coding is very time-consuming. Recording the tapes of the participants' conversations on paper, coding data and creating concepts, categorizing concepts and forming categories, comparing categories together, finding their relationship with each other, the process of developing categories based on the criteria of grounded theory - which itself requires frequent collection of data and categories, questioning, moving, deleting, etc., all of which require hours of time, hours which are very exciting despite being long and new points are found every moment. The best moment while studying with this method is the moment when the main categories are discovered and the happiest moment is when the researcher discovers the central category of the research.

#### 3.3 Open coding

Strauss and Corbin called the first stage of data analysis in grounded theory, open coding, and data processing the first step in analysis [19]. The purpose of crushing and conceptualizing data is to divide an observation, a sentence, or a paragraph into parts and to give a name or a label to each of the events, ideas, and events that indicate that phenomenon and instead sit down To create a concept, we must look at the data and ask ourselves what these data point to and what they represent [17].

The name considered for each category should be more abstract than the names of the concepts that make up the category and the category should have the most relationship with them; So that he quickly remembered what he refers to. According to Strauss and Corbin, the researcher doesn't need to take much pains to choose the right name in the early stages of the study. The important thing is to give the category a name that he can remember, think about,

and most importantly, continue to study to analyze it. At this stage, all the sentences were carefully read and the concepts extracted from one or more sentences were recorded on the left side. To create a concept, we have to look at the data and ask ourselves what this data points to and what it represents. After coding the data, all the concepts were compared and the concepts that were semantically compatible with each other formed a category and a name was considered for them. In fact, the concepts that seem to be related to the same phenomenon form a category, and this helps the researcher a lot in summarizing the data.

The data obtained from each interview determined the type of questions in the next interview. In the next interview, in addition to answering the researcher's question, the participants may also answer a few questions during their conversation; Because in a semi-structured interview, the questions are not multiple-choice and open-ended, so it is possible to get more answers than the researcher might imagine, and again both during the interview and after the analysis. data and other questions are raised for the researcher.

### 3.4 Axial coding

In axial coding, the data that were divided into concepts and categories in open coding are joined together in new ways to reveal the relationship between a main category and its subcategories [2]. In the axial coding stage, for each main category, 6 questions-what are the causal conditions, phenomenon, context, intervening conditions, action/interaction strategies and consequences? The main categories are recorded. At this stage, the process of simultaneous data collection and analysis continues to expand and complete the categories. Subcategories are related to the main categories according to the paradigm model or theoretical model. The application of this model enables the researcher to think systematically about the data and relate them in complex ways [2].

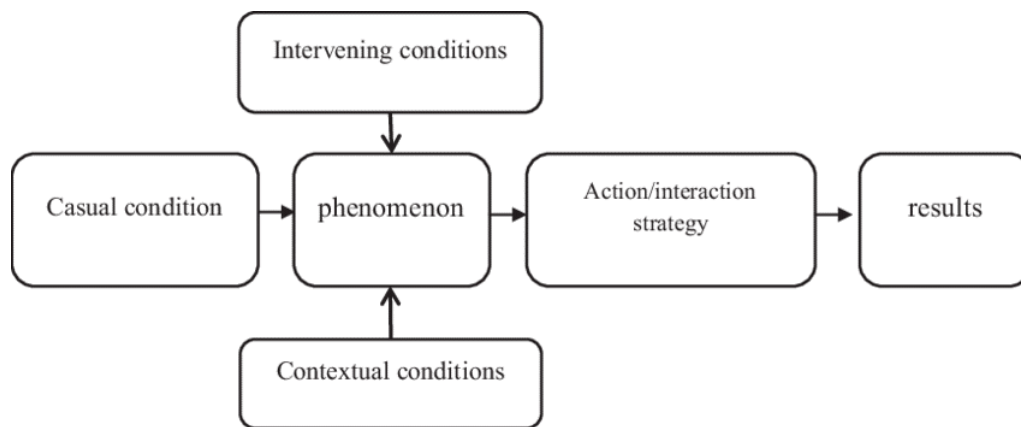


Figure 1: Paradigmatic model in the grounded theory method

Causal conditions refer to incidents, events, and happenings that lead to the occurrence or development of a phenomenon. Phenomenon means an idea, incident, event, and main event about which a set of actions or reactions are directed to manage it, or A set of actions is related to it. It is a special set of characteristics related to the phenomenon. That is the location of events or events related to a phenomenon along a range of dimensions. Context refers to a specific set of conditions within which action/reaction strategies take place. Intervening conditions refer to structural conditions related to action/interaction strategies related to a phenomenon. They facilitate or constrain strategies that are within a specific context. Action/interaction strategies are devised by actors to manage, administer, transmit or respond to a phenomenon under a specific set of observed conditions. Consequences also refer to outputs or results of action and reaction [18].

“In contextual theory, in the final integration stage, there should be a close relationship between categories with each other and with subcategories based on the characteristics of the main paradigm - conditions, context, action/interaction (which includes strategies) and consequences - be established Also, the categories should be theoretically saturated. In fact, the close connection of the categories based on the characteristics of the paradigm and their saturation gives the theory explanatory power, without which, the theory has less acceptability” [18].

### 3.5 Selective coding

In the selective coding of the storytelling process, discovering the main category and relating it to other categories according to the paradigm model, validating the relationships against the data filling in the blanks and completing

the subcategories that need to be modified, expanded and expanded. They have, it is done. In practice, these steps do not have to be done in the same order as mentioned, and they are not completely evident in practice, and the researcher is constantly going back and forth between them. In selective coding, the researcher must deal with the integration and interpretations made during the research, which is perhaps the most difficult task of the researcher, and even experienced researchers struggle with this problem [2].

In selective coding, the researcher describes his inner feelings about the subject by writing a story about the analysis [17, 2]. The creation of categories is expressed with those contents. In fact, in the story, we present a report of a series of incidents and events that happened in the past, and we deal with a descriptive narrative about the main phenomenon [18] Here, as in the previous stages, the process of questioning, displacement, and elimination And the categories are expanded. In fact, the process of going back and forth between the three coding procedures continues until the work steps. Even after writing the story, discovering the main category and establishing the relationship between the main category and other categories, the researcher can go to the field and collect specific data to fill the gaps in the formation of the theory. This work can be done for any category that seems to have a weakness in its expansion and there are questions about it.

The main goal of grounded theory is to discover the central category that integrates and integrates all the different dimensions of the theory. The product of this story is the final conceptualization of the central category for which a name is considered. This conceptual label given to the central category should be appropriate to the data that the participants expressed [17].

## 4 Research findings

### 1-Open coding

While open coding separates data into different categories, axial coding relates categories and their subcategories according to their characteristics and dimensions [18].

### 2-Axial coding

Based on the systematic approach of Strauss and Corbin, all the categories extracted from the raw data are gathered in a pattern called the axial coding pattern. This pattern includes six boxes or axes in the following order:

#### A) Causal conditions

Events are incidents and occurrences that affect the phenomenon and lead to the occurrence or development of a phenomenon [17] The concepts and identified categories related to the causal conditions of this research are presented in Table 1;

Table 1: Identified concepts and categories related to causal conditions

General category	Subcategory	Concept	Codes	
Causal conditions	Political stability	Active political system	The existence of a living and active political society	
	Economic stability	Stability in the economic system	The existence of dynamism and stability in the economy	
	Stability of rules	Binding rules		Existence of strong laws in the field of sustainability
				Changing the perspective of laws and policies towards sustainability
				meritocracy in the whole society
				Attention to spiritual and social health
				Compliance with sustainability in society
				Compliance with the standards of the day
		transparency	External transparency (society and government)	
	Cultural sustainability	Community awareness and culture	Evaluation and monitoring	Assessing and monitoring all aspects of health and wellness
				Ranking of hospitals
Basic attention to the culture of society				
			General demand	
			Attention to people and society	

#### b) background conditions

The identified concepts and categories related to the background conditions of this research are presented in Table 2;

#### c) Intervening conditions

There are broad and general conditions that facilitate and accelerate strategies and actions, or reduce and delay them as an obstacle [17]. The identified concepts and categories related to the intervening conditions of this research are presented in Table 3;

Table 2: Identified concepts and categories related to contextual conditions

General category	Subcategory	Concept	Codes	
Background conditions	Dynamics of the internal environment	Internal rules of the hospital	Domestic laws	
			Maintaining sustainability in all aspects of the hospital	
			Correct payment and absorption systems	
		planning	Planning and action	
		transparency	Internal transparency of the hospital	
		Foresight	Foresight and modernity of the hospital	
		The survival of the organization	Constant communication with the external environment	
	Employee dynamics	Update of all stakeholders		Up-to-dateness of the manager
				Up-to-date stockholders
				Using innovative and creative people familiar with current knowledge
	Dynamics of insight and awareness	Promotion of the professional society of personnel		Valuing the ideas and thoughts of creative people
				Staff training
		Awareness and organizational culture		Modern responsibility and accountability
				Attention to the culture of the region and the whole society
		Desire for excellence	Creating a culture of respect for clients	
		Creating a culture of acceptance and innovation		
Infrastructural dynamics	Development and creation of the platform	Providing resources and creating infrastructure		

Table 3: Identified concepts and categories related to intervention conditions

General category	Subcategory	Concept	Codes	
Intervening conditions	Macro environmental conditions	Influential organizations	Cooperation of community organizations with the hospital	
		Environment and community conditions		The constant influence and occurrence of the hospital from the environment and society
				Types of diseases and number of patients
	Conditions and capabilities of the organization	Status and performance of employees		Acceptance of employees
				Performance of doctors and staff
				Structure and size of the hospital
	Infrastructure conditions	The condition of the hospital		The standard of the environment and access of the hospital
			The condition of the facilities	
				Air conditioning
	Infrastructure status		Solving noise and environmental problems and pollution	

#### d) the central phenomenon

A phenomenon is an idea or an event or a main event that is governed by a set of actions and reactions or is related to it [17]. The identified concepts and categories related to the central phenomenon (sustainable innovation) of this research are presented in Table 4. Is;

Table 4: Identified concepts and categories related to a central phenomenon (sustainable innovation)

General category	Subcategory	Concept	Codes
Sustainable innovation (phenomenon-oriented)	Environmental monitoring and management	environmental	environmental
	Monitoring and social management	social	social
	Financial monitoring and management	Economic	Economic

#### e) Strategies and measures

Strategies and actions are targeted and oriented to solve the problem and manage the phenomenon and respond to it [17]. The identified concepts and categories related to the strategies and actions of this research are presented in Table 5;

#### f) Consequences

There are data that arise as a result of actions and reactions or response to the phenomenon (consequences of using strategies and actions) [17]. The concepts and categories identified related to the consequences of this research are presented in Table 6;

Table 5: Identified concepts and categories related to strategies and actions

General category	Subcategory	Concept	Codes
Strategies and actions	Quality and up-to-date services	Improving the quality of services and care	Providing quality services to clients
			Providing day care
	Health oriented	Attention to people and environment	Pay attention to the day of the hospital to the community and people
			Emphasis on health-oriented
	Keeping pace with the fourth industrial revolution and the fifth society	Keep up with today's technology	Updating the health system
			Using modern equipment and technology
Moving towards the fourth industrial revolution			
	Attention to design and architecture	Up-to-date design and architecture	Stylish and appropriate design and architecture
	Prepare for a crisis	Prepare for a crisis	Prepare for a crisis
	Biomimicry	Attention to nature	Use of clean energy
			Optimal and standard consumption of resources and energy
		Development of nature in a mutual way	Attention to green space
			Use of natural products
	Pollution management	No environmental pollution	No noise and environmental pollution
			Standard wastewater treatment by day method
Standard disposal of waste in a daily manner			

Table 6: Identified concepts and categories related to outcomes

General category	Subcategory	Concept	Codes		
consequences	Intangible consequences of society	Improving the welfare of society	Increasing the economic well-being of society		
			Increasing the vitality of the community		
			Increasing medical security and people's health		
			Maintaining the dignity and position of the patient		
		reduction in costs		Reducing community costs	
				Environmental Protection	Improving and preserving environmental resources
	Visible consequences of society				
				Intangible organizational	Improving the position of the organization
	consequences		More detailed planning	Competition and being ahead in the international environment	
				Positive image in society and internationally	
				Forecasting and better planning for the future	
				Increasing efficiency and effectiveness	More efficient delivery of medical services
					Increasing efficiency and effectiveness of the hospital
Employee satisfaction				Increasing employee morale	
Visible organizational consequences		Increase income	Increase hospital income		
			Cost control	Reducing hospital costs	

### 3- Selective coding

The last step is called selective coding. At this stage, a theoretical model will be presented that shows the relationship between the categories.

According to Strauss and Corbin, selective coding uses the results of the previous steps of coding, selects the main category and systematically relates it to other categories, validates the connections, and develops the categories that need further refinement and development giving [18].

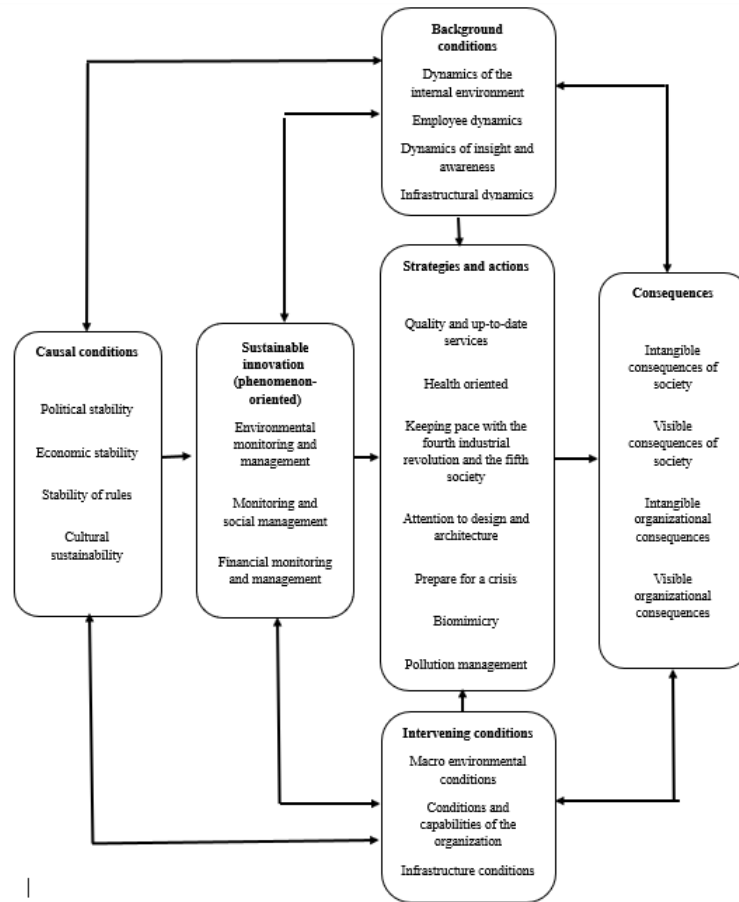


Figure 2: Model of sustainable innovation in the hospital

### 5 Conclusion

The main goal of the research was to design a model for sustainable innovation in the hospital. Achieving this goal was formed by using the paradigmatic model of the database theory method. Using this method, the raw data from in-depth interviews that were conducted with sustainable innovation experts in the healthcare sector were analyzed. The process of data collection and analysis was not two consecutive processes but was done in a zigzag and simultaneous manner, which is the nature of theoretical sampling. By analyzing the interviews line by line, open coding was done. Based on the identified open codes, central codes were formed and a theoretical model was developed with the help of selective coding. Finally, the paradigm model was approved by experts. By identifying the concepts effective on sustainable innovation in the hospital, the researcher has presented this model, and in this section, the components of the developed model are discussed and investigated.

**Causal conditions:** Causal conditions are events or events that have an impact on a central phenomenon and lead to its development. Political stability, economic stability, legal stability and cultural stability are factors that encourage hospitals to use sustainable innovation.

- **Political stability:** the category of political stability is considered as one of the causal conditions affecting sustainable innovation, and it means that the governing policies affecting the health system must have a relative and stable stability, and Politicians and statesmen should not be included.
- **Economic stability:** The category of economic stability is considered as one of the causal conditions affecting sustainable innovation, and it means that economic stability and its sustainability are one of the main conditions for creating sustainable innovation in organizations.
- **Stability of laws:** The category of stability of laws is considered as one of the causal conditions affecting sustainable innovation, and it means that laws must be binding and transparent in order for organizations to move towards sustainability.



- Cultural sustainability: The category of cultural sustainability is considered as one of the causal conditions affecting sustainable innovation, and it means that a culture of accepting and using new and emerging services in the field of sustainability should be created in the organization and society.
- A central phenomenon: a phenomenon, an idea or an event or the main event that is governed by a set of actions and reactions or related to it. In the application of sustainable innovation, the implementation of its main phenomena has a central role, which are; Environmental monitoring and management, social monitoring and management, economic monitoring and management.  
Environmental monitoring and management: Environmental monitoring and management is one of the central phenomenon factors, which means planning, implementing and monitoring the implementation of environmental issues in the organization.
- Monitoring and social management: Monitoring and social management is one of the factors of a central phenomenon, which means paying attention to social issues and society.
- Economic monitoring and management: Economic monitoring and management as another factor of the central phenomenon means management and supervision of the organization's economic issues.
- Strategies and actions: the application of the central phenomenon is done through a set of strategies and actions, strategies in a field; Health-oriented, high-quality and up-to-date services, keeping pace with the fourth industrial revolution and the fifth society, attention to design and architecture, crisis preparedness, biomimicry and pollution management. Strategies and actions are targeted and directed to solve the problem and manage the phenomenon and respond to it.
- High-quality and up-to-date services: high-quality and up-to-date services means providing the highest quality care and services to clients.
- Health-oriented: health-oriented as one of the strategies and measures of sustainable innovation, which means paying attention to the health of the environment and people, measures should be taken to prevent people from going to the hospital.
- Keeping pace with the fourth industrial revolution and the fifth society: to achieve sustainable innovation, organizations must be up-to-date and use modern equipment and technology, which in our era of the fourth industrial revolution and the fifth society is a sign of the up-to-dateness of industry and society.
- Attention to design and architecture: stylish and suitable design and architecture is one of the appropriate measures and strategies for sustainable innovation.
- Preparation for crisis: preparation for crisis is one of the strategies and actions that should be taken into consideration for sustainable innovation.
- Biomimicry: Learn from nature and incorporate what you have learned into your solutions. Nature is inherently efficient and pure and very innovative. For example, Boeing is developing ultra-light metal from a mesh design similar to that used in spider webs, honeycombs, and bird bones. , used.
- Pollution management: Pollution management is another strategy and measures of sustainable innovation, which means not creating noise and environmental pollution.
- Background conditions: implementation of the central phenomenon and strategies under complex background conditions such as; The dynamics of the internal environment, the dynamics of employees, the dynamics of insight and awareness, and the dynamics of infrastructure require special considerations of these conditions. Contextual conditions are conditions in which strategies are used to manage the phenomenon.
- Dynamics of the internal environment: The dynamics of the internal environment is one of the background conditions affecting sustainable innovation, and it means the effectiveness of the hospital's internal rules, planning, transparency, foresight, etc. to achieve sustainable innovation.
- Dynamics of employees: dynamics of employees is one of the background conditions affecting sustainable innovation, and it means that all employees, including managers, doctors, and other employees, are dynamic and alive, aware of modern science and how to provide services in a modern way. be and use it.

- The dynamics of insight and awareness: The dynamics of insight and awareness is one of the background conditions affecting sustainable innovation and means the culture of innovation acceptance as well as the training and professional development of employees.
- Infrastructural dynamics: Infrastructural dynamics is one of the background conditions affecting sustainable innovation and means providing resources and creating and developing the necessary infrastructure.
- Intervening conditions: In the dimension of interfering conditions, the conditions of the macro environment, the conditions and capabilities of the organization, and the infrastructure conditions, by affecting sustainable innovation, disrupt it. They are broad and general conditions that facilitate and accelerate strategies and actions, or reduce and delay them as an obstacle.
- Macro environment conditions: Macro environment conditions are one of the intervening conditions affecting sustainable innovation, and it means the influence of the organization from other organizations and the environment and society conditions for the implementation of sustainable innovation.
- Conditions and capabilities of the organization: The conditions and capabilities of the organization are one of the intervening conditions affecting sustainable innovation and it means that the condition and performance of the employees and the conditions and condition of the hospital are effective in the implementation of sustainable innovation.
- Infrastructural conditions: Infrastructural conditions are one of the intervening conditions affecting sustainable innovation, and it means the influence of hospital facilities and infrastructure on the formation of sustainable innovation.
- Implications: Hospitals and healthcare centers should pay attention to their environment by identifying the causal, underlying and intervening conditions and, considering their limitations and accelerating capabilities, put the implementation of sustainable innovation at the forefront of their activities so that the visible and invisible consequences of the society and The organization should be realized in order to provide mutual benefits. Consequences are results that arise as a result of actions and reactions or response to the phenomenon, or in other words, they are the consequences of using strategies and actions.
- Intangible consequences of society: The intangible consequences of sustainable innovation in society are improving the welfare of society and reducing costs in society.
- Visible consequences of society: The visible consequence of sustainable innovation in society is the preservation of the environment.
- Intangible organizational consequences: Intangible consequences of sustainable innovation in the organization include improving the organization's position, more accurate planning, increasing efficiency and effectiveness, and employee satisfaction.
- Visible organizational consequences: Visible consequences of sustainable innovation in the organization are increased income and cost control.

In this regard, Khunjeh et al showed that there is a strong relationship between resource conservation innovation in accommodation facilities and cost savings [5] Maier et al. showed that the correlation between success Innovation is the product and sustainable development of an organization [11] In another research, Lehoux et al. stated that orientation towards responsible and sustainable innovation in health is needed and sustainability can maintain health care systems [7] Sibthorpe et al. also in a research A combination of the findings of five studies focused on the sustainability of primary health care innovation in six areas (political, institutional, financial, economic, customer, and workforce). These were: the importance of social relations, networks and heroes, the impact of political, economic and social forces, the motivation and capacity of factors within the system [16].

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