JCHR

Journal of Community Health Research 2024; 13(1): 101-108.

Recognizing and Describing the Factors Affecting the Design of the Innovation Ecosystem Model in the Field of Health with an Emphasis on the Role of E-Government

Zahra Mirjalili, Abbas Babaei Nejad *, Saeed Sayadi, Hamid Reza Mollaei

Department of Public Administration, Kerman Branch, Islamic Azad University, Kerman, Iran

ARTICLE INFO

Original Article

Received: 13 Feb 2024

Accepted: 11 May 2024

Corresponding Author:
Abbas Babaei Nejad
management7204020@yahoo.com

ABSTRACT

Background: Development of innovation issues in countries has led to the formation of new concepts in this field. Some of these concepts include innovation systems ranging from national, sectoral, etc., innovation networks, commercialization, and innovation ecosystems. Therefore, the purpose of this study is to design recognition and description of the factors affecting the design of the ecosystem model of innovation in the field of health with an emphasis on the role of e-government.

Methods: The type of qualitative study is a type of theory. A semi-structured interview was used to gather information. And the analysis of Strauss and Corbyn's method and the paradoxical model were used. The samples were selected through targeted sampling. And finally, 7 senior and middle managers of government and non-governmental hospitals in Yazd province entered the study.

Results: The model designed in this study includes the effective dimensions and components, obstacles and strategies, causal conditions, contextual, intermediary and constituent elements that are the pivotal phenomenon, Shows the consequences and strategies. identifiers and Ecosystem Factors Innovation 37 Concepts, 4 Main categories Enabling policies and regulations, Access to data and infrastructure ،funding and validation opportunities and ease of acceptance and dissemination of innovations (from interviews and research literature) were formulated in the form of a conceptual model

Conclusion: The process of study was explained in the form of the story line of the electronic government data theory. Finally, the innovation ecosystem model in the field of biotechnology was designed and analyzed. Finally, this model can be used to design an innovation ecosystem in the field of health.

Keywords: Ecosystem, innovation, technology, electronics, health, hospital

How to cite this paper:

Mirjalili Z, Babaei Nejad A, Sayadi S, Mollaei HR. Recognizing and Describing the Factors Affecting the Design of the Innovation Ecosystem Model in the Field of Health with an Emphasis on the Role of E-Government. J Community Health Research 2024; 13(1): 101-108.

[DOI: 10.18502/jchr.v13i12.15685]

Introduction

The term ecosystem (ecosystem) is derived from two terms «aco» and «system» (system), the first to the relationship between living organisms and their environment ،And the second refers to a whole systemized cosmos (1). It can be said that an ecosystem means a system of living organisms and their environment (2). According to the general theory of systems, a system means a set of objects that interact with each other. All systems include components and relationships and features (3). systems also share a common boundary and common purpose (4). The term ecosystem has been used in various fields except living systems, in the field of management ،The term is usually used to refer to a network of co-dependent organizations that have been formed around a focal firm or platform 5 or 5, and have formed a focal value 6. Innovation is also commonly referred to as new ideas, improvements, or solutions that have been implemented into useful outcomes 1. The innovation ecosystem is made up of « economic factors and economic relations, as well as non-economic components such as technology, institutions, social interactions and culture (7).

E-government refers to the use of information and communication technology programs in the public sector, with the aim of improving management efficiency and providing the convenience of access to government information and services to the public. Among the goals that are usually raised for e-government, we can mention these, improving the quality of public services and changing government with increasing access ،Efficiency and transparency, as well as more recently, the issue of increasing public participation has also been raised (8). E-government is a new, simple and challenging concept for governments, and it is a concept that has come to realize with the coming of the virtual and digital age, a change in contexts Various have become inevitable and in the event of nonconformity, the inefficiency of organizations will become more evident than size. E-government is the fruit of a transformation in information technology, which is the use of technology to increase access to and provide services and information to citizens, business partners, employees and other institutions. E-government means the government's use of technology, especially information and communication technology, to promote access to and the provision of government services and information to people, business partners, employees and other devices and governments or the continuous optimization of service delivery, participation and governance through the transformation of internal and external communications are interpreted by technology, the internet and new media (9).

Health technology is a multidisciplinary process of policy analysis that addresses clinical, economic, social, ethical aspects, added value checks the release and use of health technology. Innovation plays an important role in health (10). New approaches include outbreaks and tools that aim to reduce cost and improve quality of life. In this domain, the activity of the organization is unpredictable and dynamic. While decision-makers should manage the complex relationship between multiple actors and different entities (patients, health care providers, and suppliers). Numerous innovations in the field of health have not only been able to increase their ability to respond to patients' expectations of life expectancy, quality of life, Diagnosis and treatment methods are also effective for more efficient organization (12).

In the study of Dabbagh Afrouz and colleagues, 5 main articles of Amal Ali (State, Finance), the central category (University and Research Institutions), strategies (University and Research-oriented institutions, Shorten the process of obtaining the necessary permits, state support for research and development, material and spiritual incentives and increase in venture capital), consequences (development and economic growth) and contextual factors (location attraction), banking Services, Intellectual Property Rights) Intervention Conditions (Culture) Designing a Strategic Model for Innovation Ecosystem in Health Identified (13).

In the study of Asadi Fard and colleagues, 4

[DOI: 10.18502/jchr.v13i12.15685]

types of cooperation, the method of institutionalization, activities and characteristics of the main actor were identified as the main components (14).

Given that e-government in the world and Iran has been new and has not yet reached the stage of evolution, it can be said that research has so far failed to be an integrated model of innovation ecosystem in the field of biotechnology, especially in the health system, a successful ecosystem is the result of a long-term transformation and there are no identical guidelines for all ecosystems. Due to the lack of compatibility of existing models with local culture and environment, any kind of prediction is expected. Therefore, this study aimed to identify and describe the factors affecting the design of the ecosystem model of innovation in the field of health with an emphasis on the role of e-government in 1402 in Yazd province. The results of this research are aimed at policy makers, planners, managers and university presidents, Health-based companies help entrepreneurs and startups to innovate so that they don't fall behind science and technology in the current global competition.

Methods

The type of qualitative study is a type of fuzzy cognitive theory and mapping. In order to sample from sample, sample method was used purposefully. Finally, 7 senior and middle managers of government and non-governmental hospitals in Yazd province were carried out. In order to formulate the foundations, definitions and theoretical concepts of library resources, including library resources, treasure trove & treasure trove & treasure & treasure ^_Need, SID, G ^_Need. In order to collect the desired data and measure the variables of the research, interviews have been used. In reviewing the validity of the content, test questions are provided to experts or some subjects and ask them to determine whether the test questions measure the adjective and whether the questions contain the entire content It covers the test or not. If there is agreement between different persons, the validity of the test, that test has content validity to examine the formal validity, the opinions of the target sample group or the company of research representatives are used, and this part of the test validity does not require the opinions of expert experts.

The way of conducting the interview was in this way that at first the topic of the interview was generally stated in relation to the design of the innovation ecosystem model with emphasis on the role of electronic government and further explanations were avoided due to the possible bias of the interviewee's mind. After the first interview, all the issues expressed by him were re-read and related topics of the initial coding, which part of this coding was done in a written and professional manner. Then the second interview was conducted and the issues related to the previous codes were separated and assigned to new topics. This process was also used in later interviews until practically new codes were not extracted from the topics discussed. It is necessary to state that in the qualitative method of interviewing, while trying to non-intervention of the researchers personally, although they are very strong, their personal opinion will be entered. Therefore, in order to reduce the direct application of the researcher's opinion in the purification of the initial codes, all the extracted codes were converted into direct questions with the relevant criteria and a questionnaire was distributed and collected.

The approach of this research in research data analysis is the process of editing. In this type of style, the editor who, in the wake of meaningful sections, reduces and increases the words or sentences, removes unnecessary words in the text, enters the text. The best example of a "data-based approach" is Glaser and Strauss 1967, which provides guidelines for the development of qualitative data-driven theory. In fundamental conceptualization theory, this process is called "continuous investigation" and aims to reach the point of "theoretical philosophy" where additional analysis does not play any role in the discovery of new knowledge about a category or class. In fact, it can be said that interviews continue until they are theoretically saturated. To extract the concepts

[DOI: 10.18502/jchr.v13i12.15685]

from the mass volume of information that is obtained during the interview, a coding is done. Corbin and Strauss (1998) consider coding to be a kind of deep analysis in which data ‹The word is studied to the word, and eventually the codes are removed from the bottom to the words or phrases. In this research, "primary and secondary" research has been used to form concepts and categories.

Results

Table 1 shows the demographic characteristics of the participants in the study. Most of the male participants were 4.71%, between the age of 54-36, 85.71%, and had a master's education, 28.57.%

Table 1. Demographic characteristics of the participants in the study

Variable	Frequency	Percentage (%)
Male	5	71.439
Female	2	28.57
36 to 40 years old	5	71.439
41 to 45 years old	1	14.28
46 to 50 years old	1	14.28
Doctorate degree	5	71.439
Master's degree	2	28.57
Work experience		
Less than 10 years	1	14.28
10-20 years	2	28.57
More than 20 years	4	57.14

Results from interviews

CODED FINDINGS

This section consists of two parts, the table of the first codes extracted from the interviews and the table of categories extracted from the concepts along with their secondary codes are presented in Table 2 of the concepts extracted from the interviews.

After compiling the key points and concepts, the information categorized in Table 3 coded results are presented based on category, concept and secondary code

Table 2. Concepts extracted from interviews

Row	Extracted Initial Codes
1	Strong leadership and vision from government authorities to support digital health
2	Developing a national digital health strategy with stakeholders' input
3	Sandbox regulatory environments for testing innovations in a controlled setting
4	Tax incentives for investment in digital health startups and research & development
5	Simplified procurement policies for testing digital health solutions
6	Global patient identifiers and interoperable EHR systems
7	APIs and architectures to encourage third-party innovations
8	Secure cloud infrastructure for storing and analyzing health data
9	Workforce training programs in digital literacy and new technologies
10	Public-private partnerships for sharing risks and benefits
11	Competitions and awards for identifying promising innovations
12	Frameworks of responsibility and cybersecurity standards for digital health
13	Telehealth regulations enabling virtual care models and remote monitoring
14	Support for international collaboration and knowledge sharing
15	Budget for evaluating effectiveness and cost-effectiveness of feedback mechanisms in design processes
16	Standardization of data formats, terminologies, and protocols
17	Regulations concerning artificial intelligence, data privacy, and information governance
18	Interoperability between old and new electronic health systems
19	Change management support during organizational transitions
20	Technical assistance for implementation and system integration
21	Workforce training on digital skills and new care models

[DOI: 10.18502/jchr.v13i12.15685]

Row	Extracted Initial Codes
22	Incentives for adopting and meaningfully using digital health tools
23	Consumer protection against potential digital health harms
24	| Pilot programs to demonstrate effectiveness to policymakers
25	Innovation hubs and testing grounds for emerging technologies
26	Cybersecurity requirements for digital health vendors
27	Reimbursements for digital health interventions
28	Portability of health data between providers and platforms
29	Alignment of digital priorities among government health agencies
30	Oversight processes for monitoring and auditing data operations
31	Support for scaling successful digital health testers at a national level
32	Guiding artificial intelligence insights into public health decision-making
33	Protection against algorithmic bias and discriminatory effects
34	Emergency plans for technology failures or outages
35	Engagement with ethical, legal, and social issues surrounding digital health
36	Commitment to reducing inequality in access and digital literacy collaboration across sectors and disciplines
37	Assessment of successes and failures to improve future iterations

Table 3. Coding results

Row	Factors
1	Simple regulatory approvals to incentivize digital health innovations
2	Policies on health data standards and exchange
3	Guidelines for the use of artificial intelligence and accountability in healthcare
4	Telemedicine laws enabling virtual care models
5	Procurement policies facilitating pilot implementation of innovations
6	Deployment of health identifier systems and EMR / EHR
7	Accessible APIs for integration with public digital health platforms
8	Anonymous public health datasets for analysis
9	Cloud infrastructure and data storage for scaling innovations
10	Rapid integration with government remote health systems
11	Government financial aid and incentives for health technology innovations
12	Electronic procurement mechanisms for startups to supply to the public health sector
13	Platforms for experimental testing and validation of innovations at scale
14	Public-private partnership models for collaborative innovation
15	Awards and recognition programs for identifying promising innovations
16	Digital literacy programs for integrating innovations into workflows
17	Management support transition in change phases
18	Online educational systems for users of new health innovations
19	Mechanisms for user feedback and acceptance monitoring
20	Communication campaigns to build trust and awareness

Categories are more abstract and at a higher level than what concepts show. That is, combining and putting together a few concepts of forming a category or class. This final table is used to formulate questionnaires in the second stage.

Identifying the Factors Affecting the Role of E-Government in the Biobomass Development of Innovation in Health

Validation and adjustment of the extracted factors were carried out based on the views of experts. In the interviews conducted with experts, 7 main factors are identified as factors affecting the role of e-government on the development of innovation ecosystem in the field of health ، Classification and set in table 4.

[DOI: 10.18502/jchr.v13i12.15685]

Table 4. Factors Affecting the Role of E-Government in the Development of Ecosystem Innovation in Health

Row	Factors	Of factors of main indicators
1	Simple regulatory approvals to encourage digital health innovations	Enable policies and regulations
2	Policies around data standards and health information exchange	
3	Guidelines for the use of artificial intelligence and accountability in healthcare	
4	Telemedicine laws enabling virtual care models	
5	Procurement policies facilitating pilot implementation of innovations	
6	Deployment of health identifier systems and EMR / EHR Access to data and infrastructure	Access to data and infrastructure
7	7 Accessible APIs for integration with public digital health platforms	
8	Anonymous public health datasets for analysis	
9	Cloud infrastructure and data storage for scaling innovations	
10	Rapid integration with government remote health systems	
11	Government financial aid and incentives for health technology innovations Financial opportunities and validation	Funding and accreditation opportunities
12	12 Electronic procurement mechanisms for startups to supply to the public health sector	
13	13 Platforms for experimental testing and validation of innovations at scale	
14	Public-private partnership models for collaborative innovation	
15	Awards and recognition programs for identifying promising innovations	
16	Digital literacy programs for integrating innovations into workflows Facilitating acceptance and dissemination of innovations	Ease of adoption and dissemination of innovations
17	Management support transition in change phases	
18	Online educational systems for users of new health innovations	
19	Mechanisms for user feedback and acceptance monitoring	
20	Communication campaigns to build trust and awareness	

Discussion

The present study was conducted to identify and describe the factors affecting the design of the innovation ecosystem model in the field of health with an emphasis on the role of e-government in Yazd province.

The development of innovation issues in countries has led to the formation of new concepts in this field (15). Some of these concepts include innovation systems ranging from national, sectoral, etc., innovation networks, commercialization and innovation ecosystem (16). In the past few years, some businesses have been formed with an innovative model in Iran and have grown well, which can be referred to as Digi Kala, Alibaba or Snap 1. But despite the formation and growth of a number of successful examples, the ecosystem of innovative businesses in Iran still exists in the early stages of its emergence and development. The biotech industry has a special place and feature in the modern industry sector (18). The industry has brought new scientific disciplines and attitudes, and in less than three decades, the pace of growth and development in its functional areas is astonishing (17). The success and impact of this industry is itself the result of its vast capabilities and scope of action (16)

In creating innovative ecosystems, policymakers must identify different bottlenecks, and in the early stages must ensure the active participation of local actors, which is the stage of need to build or upgrade the facilities are infrastructure. The absence of one or more coordinating actors can prevent the development of a Novaian ecosystem. On the other hand, the participation of local companies of organizations and universities promotes the growth and strengthening of the technology ecosystem. And ultimately, the growth of these systems will lead to the growth and development of a sustainable economy, and the cycle will be created. This way, with the development of economic growth, the government

[DOI: 10.18502/jchr.v13i12.15685]

gets more resources and more funds can be spent on research and research activities (13).

The results of this study showed that the 4 main components of enabling policies and regulations, data access and infrastructure ،Financing and validation opportunities and ease of acceptance and dissemination of innovations play a role in creating the ecosystem of innovation. While in the study of Dabbagh Afrouz and colleagues, 5 components of causal factors (government, financial capital), central category (university and research institutions), strategies (founding universities and research-oriented institutions،Shorten the process of obtaining licenses, government support for research and development, material and spiritual incentives and increase in venture capital), consequences (economic development and growth) and contextual factors (local attractiveness, banking services, intellectual property rights) intervening conditions (culture) were identified (13). And in the study of Asadi Fard and colleagues, factors affecting the formation and development of the university-based innovation ecosystem in 4 main categories including the type of cooperation, the way of institutionalization ،the activities and characteristics of the main actor are classified (14).

Conclusion

The results showed that in order to promote technology in the field of health, 4 basic dimensions (activation of policies and regulations, access to data and infrastructure) must be ،funding and validation opportunities and ease of acceptance and dissemination of innovations (noticed). The process was explained in the form of the story line of the data theory of the electronic government. Finally, the innovation ecosystem model in the field of biotechnology was designed and analyzed. Finally, this model can be used to design an innovation ecosystem in the field of health.

Conflict of interest

The authors hereby state that this work is the result of an independent study and has no conflict of interest with the organization or other persons. There is no conflict of interest among the authors of this article.

Acknowledgments

All the senior and middle managers of Yazd University of Medical Sciences who helped us in the implementation of this research are sincerely grateful.

Conflict of interest

The authors have no conflicts of interest to declare for this study.

Funding

None

Ethical considerations

Ethical considerations were carefully addressed and implemented in the research study, including obtaining informed consent from participants, ensuring their privacy and confidentiality, and conducting the study in accordance with relevant ethical guidelines and regulations.

Code of ethics

IR.IAU.KERMAN.REC.1402.111

Authors' contribution

All authors (Z.M., A.B.N., S.S., H.R.M) had an equal contributio and were involved in all aspects of study conception and design, data collection, data analysis, interpretation, drafting of the manuscript, and critically revising the manuscript for intellectually important content. All the authors have read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Open access policy

JCHR does not charge readers and their institutions for access to its papers. Full-text downloads of all new and archived papers are free of charge.

References

1. Durst S, Poutanen P. Success factors of innovation ecosystems-Initial insights from. The Role of Objects in the

[DOI: 10.18502/jchr.v13i12.15685]

Constitution of Collaborative Spaces: 27.
2. Hajikhani A. Emergence and dissemination of ecosystem concept in innovation studies: A systematic literature review study; 2017. [Persian]
3. Carlsson B, Jacobsson S, Holmén M, Rickne A. Innovation systems: analytical and methodological issues. Research policy. 2002; 31(2): 233-45.
4. Bramwell A, Hepburn N, Wolfe DA. Growing innovation ecosystems: University-industry knowledge transfer and regional economic development in Canada. Final Report to the Social Sciences and Humanities Research Council of Canada. 2012; 62.
5. Autio E, Thomas L. Innovation ecosystems. The Oxford handbook of innovation management; 2014.
6. Adner R. Ecosystem as structure: An actionable construct for strategy. Journal of management. 2017; 43(1): 39-58.
7. Mercan B, Goktas D. Components of innovation ecosystems: A cross-country study. International research journal of finance and economics. 2011; 76(16): 102-12.
8. Esmailipour Masouleh E, Afshari-Mofrad M, Bashiri M. Innovation Ecosystem in Iran's Automotive Industry; What it has, What it Lacks. Journal of Improvement Management. 2022; 15(4): 105-27. [Persian]
9. Asgharzadeh S, Safari A. Investigating the position of electronic government in the era of virtual communication. Management and accounting studies. 2023; 9(1): 113-22. [Persian]
10. Dabbagafrouz R, Zendeh AB, Pasebani M. Designing a Strategic Model of Innovation Ecosystem by Using Grounded Theory in the Field of Biotechnology. Depiction of Health. 2021; 12(2): 113-26. [Persian]
11. Arena C, Catuogno S, Saggese S, Sarto F. The adoption of e-Health in public hospitals. Unfolding the gender dimension of TMT and line managers. Public Management Review. 2021; 23(10): 1553-79.
12. Soumitra D, Lanvin B, Wunsch-Vincent S, editors. Global innovation index 2020: who will finance innovation?. WIPO; 2020.
13. Dabbagafrouz R, Zendeh AB, Pasebani M. Designing a Strategic Model of Innovation Ecosystem by Using Grounded Theory in the Field of Biotechnology. Depiction of Health. 2021; 12(2): 113-26. [Persian]
14. Asadifard R, Nozari M. A Development Pattern for University-Based Innovation Ecosystems: The Case Study of Sharif Innovation District. Journal Strategi c Studies of Public Policy. 2023; 12(45): 140-65. [Persian]
15. Ahmadi A, Shirani M, Khaledifar A, Hashemzadeh M, Solati K, Kheiri S, Sadeghi M, Mohammadian-Hafshejani A, Shahraki HR, Asgharzadeh A, Salehifard AZ. Non-communicable diseases in the southwest of Iran: profile and baseline data from the Shahrekord PERSIAN Cohort Study. BMC Public Health. 2021; 21: 1-4. [Persian]
16. Song Y, Sahut JM, Zhang Z, Tian Y, Hikkerova L. The effects of government subsidies on the sustainable innovation of university-industry collaboration. Technological Forecasting and Social Change. 2022; 174: 121233.
17. Smorodinskaya N, Russell M, Katukov D, Still K. Innovation ecosystems vs. innovation systems in terms of collaboration and co-creation of value; 2017.
18. Almpanopoulou A, Ritala P, Blomqvist K. Innovation ecosystem emergence barriers: Institutional perspective; 2019.

[DOI: 10.18502/jchr.v13i12.15685]