Research Article

Identifying and prioritizing barriers and challenges of Social Innovation implementation in the Public Sector

Identificando y priorizando las barreras y los retos de la implementación de la Innovación Social en el Sector Público

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Abstract: Social innovation (SI) is one of the latest approaches for empowering the public sector (PS). Because of the bureaucratic nature of the PS, implementation of social innovations in PS faces many challenges. This study is trying to identify and prioritize these barriers and challenges focusing on the judicial sector. This study has used a mixed-method. In the qualitative stage, by reviewing the literature and applying the focus group interview method with 12 experts, 40 barriers and challenges were organized into seven categories. In the quantitative step, 18 experts that were identified based on the purposive sampling method have answered the questionnaire and the challenges were prioritized using a fuzzy TOPSIS method. The results showed that the lack of a proper regulatory system for social innovators is the main challenge the SI faces in the judicial system. Finally, structural, functional, and behavioral recommendations were provided to remove these barriers.

Keywords: innovation; social innovation; participatory innovation; open innovation; public sector; judicial system.

Resumen: La innovación social (IS) es uno de los últimos enfoques para potenciar el sector público (SP). Debido a la naturaleza burocrática del SP, la implementación de innovaciones sociales en el SP se enfrenta a muchos retos. Este estudio trata de identificar y priorizar estas barreras y desafíos centrándose en el sector judicial. Este estudio ha utilizado un método mixto. En la etapa cualitativa, mediante la revisión de la literatura y la aplicación de entrevistas a grupos focales con la participación de 12 expertos, se identificaron 40 barreras y desafíos en siete categorías. En la etapa cuantitativa, 18 expertos fueron identificados, en base al método de muestreo intencional y los retos fueron priorizados utilizando el método TOPSIS difuso. Los resultados mostraron que la falta de un sistema regulador adecuado para los innovadores sociales es el principal reto al que se enfrenta la IS en el sistema judicial. Por último, se ofrecieron recomendaciones estructurales, funcionales y de comportamiento para eliminar estas barreras.

Palabras clave: innovación; innovación social; innovación participativa; innovación abierta; sector público; sistema judicial.

1. Introduction and problem statement

Social Innovation (SI) is an emerging phenomenon for solving social challenges more efficiently (Nicholls & Murdock, 2012). SI focuses on new solutions or innovations that somewhat have social goals (Howaldt & Schwarz, 2010). Public service sector innovations are a kind of the SI forms used to solve social problems and provide services to people (Arundel et al., 2019). Open innovation plays a virtual role in SI. This concept implies using co-creation in innovative processes; Thus, open innovation expands the porous organizational model to all aspects of an organization (Unceta et al., 2017).

Despite the many benefits of SI has in the public sector, in practice, the implementation of SI faces severe challenges and barriers that have prevented its complete implementation in the PS and have not let its profits and achievements be tangible. SI strongly depends on the type of political system and structure of government and the requirements of the country's administrative system and PS. Because of their bureaucratic nature, government and administrative systems in different countries would not accept the innovative approaches especially SI. The existing barriers and challenges must first be identified, and the necessary actions for removing the barriers must be put on the agenda. The judiciary system, as one of the structures in the judicial system, is not an exception, but its specific limitations and requirements for implementing SI are more significant.

This study aims to identify the barriers and challenges facing the implementation of SI in the PS, focusing on judiciary system. The issue of SI implementation in the PS- especially the Judiciary system- which has a bureaucratic and hierarchical administrative system- is facing severe challenges, and no action has been taken in this regard.

This study has been formed to solve this problem and identify the challenges facing the entrance and institutionalization of SI for governing and improving the capabilities and empowerment of government.

The contribution of the recent study in the subject definition is that the barriers and challenges of SI implementation in the PS and especially the judiciary system have not been studied. The second contribution which is methodological, is using a mixed-method to identify and prioritize barriers to SI in the PS, which has not been used in previous researches of this field.

The challenges of SI implementation are first identified by reviewing the scientific literature to achieve the purpose of the research. In the next step, by holding focus group meetings with 12 experts, local and specific challenges and barriers facing SI implementation in the administrative system and PS of Iran focusing on the judiciary system were identified, and in the next step by using the fuzzy TOPSIS method, barriers and challenges are prioritized and finally policy solutions and recommendations to remove the barriers and overcome the challenges of SI implementation within the PS especially the judiciary system are discovered.

2. Literature review

In this section a brief overview of the literature on SI, SI in the PS, and the functions and achievements of SI in the PS is presented.

2.1. Concept of Social Innovation (SI)

Social innovation is defined as the process of capacity building, empowerment, and governance based on interpersonal relationships, emphasizing skills, abilities and competencies, assets and social capital, participation, and responsibility of various actors in developing and implementing public programs (Mobini & Keshtkar, 2018). The SI definition expresses creating ideas, services, products, and models that meet the necessities of society and form new social relationships and collaborations. It can be said that SI is essential for society and increases the capacity of society for interaction (Murray et al., 2010).

In the Goldenberg's view SI is "the implementation of new ideas or ways to improve and reconstruct social activities, behaviors, processes, or products to arrange the challenges in the social and economic area." (Goldenberg et al., 2009) Unlike the technological and industrial innovation, SI is explicit in showing the needs of human, and this concept is seriously tied to the discussion of Schumpeter's creative destruction (Fox & Baines, 2019). Molart defines SI as the output of activities that can lead to an effective way of improving social structure and relationships, as well as improving society (Nicholls & Murdock, 2012).

In conclusion, it can be said that SIs are new ideas that simultaneously meet social needs and create new collaborations or social relationships. Today, solving social problems requires that all sectors work together to identify problems and solutions. Governments cannot solve emerging policy issues alone without using social and environmental capacities and capabilities.

2.2. Social innovation in the Public Sector (PS)

Social Innovation in the Public Sector is an innovation that affects the life and well-being of society, especially in the supplying of services related to the public interest (Ramadani et al., 2020). Innovation is necessary for the public service sector to improve performance and assess the needs of community and the efficiency of the services (Nicholls & Murdock, 2012). The relationship between entrepreneurs and administrative and political officials has always been a fundamental and pervasive issue during the change in time and content. Recently, in all parts of the world, SI has been the focus. In the European Union, programs for facilitating various interventions connected to research, learning, urban regeneration, public procurement, and rural development have attracted corporate interest and general concern for at least two decades (Hulgård & Ferreira, 2019).

In the PS, innovations involve substantial social and typical aspects and are often systemic. For example, if service production is reduced and costs in one area of service are increased, social problems in other areas will appear. Public service modernization must consider different drivers of policy, professional, and managerial issues (Kallio et al., 2013). Public innovation in the PS focuses on further encouraging and supporting integrated and coherent policy solutions; accordingly, SI is concerned with improving the methods of implementation and evaluating outputs and achievements. In other words, there are ways to renew policies to make them more efficient, effective, and adaptable in response to new social needs. SI also seeks to find better ways to tackle poverty and social discrimination through changing regulations and financial frameworks (Mobini & Keshtkar, 2018).

SI in the PS ultimately seeks to change power relations because the problems we overcome are because of existing institutional methods (Hulgård & Ferreira, 2019). SI analysis should cover a variety of dimensions, including categorizing actors, identifying cooperative processes and activities, identifying social needs, delivering social improvement, and innovating (Correia et al., 2016). Therefore, it can be said that SI in the PS seeks to gather various resources and actors to solve social and political problems that traditional and bureaucratic solutions cannot solve.

2.3. Functions and achievements of Social Innovation in the Public Sector

SociaI Innovation has no clear boundary. It can occur in all areas of governance, public and private sectors (Murray et al., 2010). SI is one of the essential structures for understanding and creating sustainable social change and can bring more value to public services according to the needs of people more effectively and comprehensively (Arundel et al., 2019). Successful SI leads to positive changes, human resource improvement actions, transformational impacts, and models (Goldenberg et al., 2009). Innovation can also change the governance of public services by enhancing interactions, transparency, performance, and satisfaction (Schröer, 2021).

SI in its tools and goals is a collection that provides collective empowerment of individuals, meets social needs, and achieves social change. Recently, SI has become popular in policy-making and development organization projects as a tool for solving emerging social problems (Kumari

et al., 2020). SI leads to multi-level interactions of relevant stakeholders, such as public organizations, citizens, and businesses with different interests and resources. In other words, the private sector, the PS, the volunteer sector, and civil society can help the SI process (Mulyaningsih et al., 2014). Briefly, SI is a new way to solve a social problem more effectively, efficiently, sustainably, and relatively than the existing solutions. The value created for it belongs to the whole society.

3. Research background

Research in the field of SI in the PS is relatively new; therefore, the existing theories and scientific literature in this field are limited and evolving. According to the subject of the present article, in this section, the research on challenges and barriers to SI implementation in the PS is briefly reviewed. It should be noted that no research has been conducted in Iran on the barriers and challenges of SI in the PS and particularly in the judiciary system.

The Bureau of EU Policy Advisers identifies barriers and challenges to SI, including funding, governance and coordination, legal and cultural awareness, skills and education, data scarcity, and measurement indicators (Hubert, 2011). In the TEPSIE project, barriers to SI were divided into two groups which are structural barriers that are because of the social and political characteristics, economic and technological contexts in which innovators operate, and barriers to representation that include the characteristics and actions of individuals or organizations that are involved in the SI process (Mendes et al., 2012). The European Union and the Young Foundation together, divided the SI barriers into four categories, including access to finance, scaling models, and the measurement of indicators, skills, networks, and intermediaries (European Union & The Young Foundation, 2010).

PS innovation always carries risks in the financing, individual involvement, and political capital (Murray et al., 2010). Ramdani et al. (2020) introduced financial issues, governance, skills, and measuring innovation as the main challenges of SI in the PS (Ramadani et al., 2020). Oganisjana et al. (2017) also mentioned lack of funding, passivity in society, administrative and bureaucratic barriers, and institutional challenges as barriers to SI in the PS (Oganisjana et al., 2017).

Another study identifies three factors that cause decrease of innovation in the PS: lack of reward systems, lack of measurement systems, and lack of personal motivation (Arundel et al., 2019). Also, Mulgan et al. (2007) identified four challenges of SI in creating lasting social change which are: Efficiency (concerning on how institutions maintain innovation and perceive the capacities that exists). Stakeholder interests (how SI processes encompass all interests or align interests with all parties). Positive interpretations of stakeholders (feeling equality in facing existing problems); And building relationships with all stakeholders that have influence each other (Mulgan, 2007). Hoggard (2014) also states that barriers to SI may be formal or informal and at the individual or social level. He divides these barriers into four straight lines in a matrix, as shown in Table 1 (Hougaard, 2014).

Table 1. Barriers to SI in the PS.

		Barriers levels	
		Individual-level	**Social level**
Barriers formality	Formal barriers	competency, lack of network of opportunities, and conflict of interest	Law, silo views in the PS, lack of financial resources, and conflict of interest
	Informal barriers	Avoid risk-taking and distrust.	Lack of measuring tools, uncertainties, organizational and social culture

Source: Author's elaboration.

Reviewing the literature and summarizing it shows that the implementation of SI in the PS faces many legal, political, administrative, and economic challenges and barriers. This study tries to identify all the barriers, classify them, and then prioritize them by experts so that strategic and operational programs would be designed for them according to their priorities.

4. Research method

The present study tries to identify the prioritization of SI implementation barriers in the PS in the context of the judicial sector in Iran, but the results can also be true for other judicial systems as the same nature they have. The identification and prioritizing of the barriers is done using a mixed-method. The mixed-methods were formed based on the main challenge of two quantitative and qualitative approaches that came from the paradigmatic conflict between positivists and non-positivists about the ontological, epistemological, and methodological assumptions of social sciences. This method, which sought to create a kind of convergence in dual quantitative and qualitative approaches, was introduced as the third methodological movement (Tashakkori & Teddlie, 2003) and, according to some thinkers (Creswell & Plano Clark, 2003), responded to the limitations of two previous approaches.

Because of the mentioned necessity, in recent years, special actions have been made to combine quantitative and qualitative methods in researching social and behavioural issues and management issues. A set of mixed methods has emerged from the combination of these two categories of methods. The steps of performing the mixed method in this study are shown in Table 2.

Table 2. Research Stages to Identify and Prioritize Barriers to SI in the PS (Judiciary system).

Qualitative research	Library Method: Extracting SI Challenges and Barriers in the PS
	Focus group interviews: 12 experts in the field of SI, PS and administrative system, judiciary system, governance, and public policy
	Determining the decision tree of barriers to the implementation of SI in the PS and particularly the judiciary system
Quantitative research	Designing questionnaire and using of TOPSIS method to prioritize challenges based on expert's opinion
	Ranking and prioritizing barriers and challenges based on the TOPSIS method
	Provide policy and application recommendations to address priority barriers and challenges

Source: Author's elaboration.

5. Analysis of findings

In this section, the research findings in both qualitative and quantitative stages are described in detail and analyzed.

5.1. Qualitative stage: Applying the focus group interview method

One of the qualitative interview techniques that has a wide usage is focus group, It is designed to create interaction between group members in order to provide motivation for a deep discussion and to discover new aspect of the subject matter (Corbetta, 2003). The main characteristic of focus group interviews is the discussion between group members, which stimulates the desire to think and exchange theories and opinons (Kitzinger & Barbour, 1999).

Sampling in the qualitative stage of this study was based on purposive sampling. Specifications Criteria for selecting individuals to be invited to the focus group meeting are specialized and expert academics in the field of SI, SI activists and event organizers, judges and

judicial prosecutors, and administrative and staff officials of the Judiciary system (Department of Crime Prevention, Department of Strategy, Department of Human Resources, Judiciary Research Institute, etc.) and academic experts in the field of governance, policy-making and government management.

First, by reviewing the literature and identifying the SI implementation barriers in the PS, a summary that shows the barriers and challenges was prepared. The challenges identified in the works were provided to the focus group members, and by holding a meeting with the 12 experts using the focus group interview method, the barriers to SI in the PS were discussed with emphasis on the judiciary system. Finally, 40 barriers to SI were identified in 7 categories specified in Table 3.

Table 3. Barriers and challenges of SI in the Judiciary.

Dimensions	Barriers and challenges	Sources
Institutional-political barriers	Passivity in society to solve public problems	(Oganisjana et al., 2017), (Brown & Wyatt, 2010), (Seyfang & Smith, 2007)
	The dominance of political views instead of functional ideas in society	(Hougaard, 2014), (Murray et al., 2010), (van der Geest& Heuts, 2008)
	Institutionalizing the belief of people not participating throughout history (the monarchy of the government)	(Mendes et al., 2012), (European Union & The Young Foundation, 2010)
	The tradition of secrecy in the PS and the security and political perspective	(Mendes et al., 2012), (Bureau of European Policy Advisers of European Commission, 2011)
	The extreme monopoly of power in society	(Caulier-Grice et al., 2012), (arayama & Nitta, 2011)
	Lack of accessible communication in society and lack of reception of society to the experience and cooperation of others	(Mendes et al., 2012), (Waasdorp & Ruiter, 2011), (Florida & Cushing, 2009)
Legal – regulations barriers	Lack of formal laws and regulations for SI	(Hougaard, 2014), (European Union & The Young Foundation, 2010), (Brown & Wyatt, 2010)
	Conflict of interest in implementing SI	(Oganisjana et al., 2017), (Sriram et al., 1990), (Moore & Westley, 2011), (van der Geest & Heuts, 2008)
	Lack of infrastructure for intellectual property	(Burt, 2004), (Caulier-Grice et al., 2012), (Seyfang & Smith, 2007)
	Lack of legal guarantees to support innovative ideas	(Caulier-Grice et al., 2012), (Brown & Wyatt, 2010), (Harayama & Nitta, 2011)
	Legal restrictions on the application of innovative approaches in the PS	(Mendes et al., 2012), (Burt, 2004)
	Lack of proper regulatory system for social innovators	(Mulgan, 2006), (Chalmers, 2011), (Hubert, 2011)
Economic-financial barriers	Lack of government funding	(Waasdorp & Ruiter, 2011), (Moore & Westley, 2011)
	Lack of designing new methods of financing in the PS	(Oganisjana et al., 2017), (European Union & The Young Foundation, 2010)

Dimensions	Barriers and challenges	Sources
	Short-term budgets and short-term horizons of officials	(Mendes et al. , 2012), (Moore & Westley, 2011)
	the difficulty of creating wealth from SI ideas in the PS	(Caulier-Grice et al., 2012), (Bureau of European Policy Advisers of European Commission, 2011)
	Reducing PS issues and challenges to structural and financial challenges	(Mulgan 2006), (Brown & Wyatt, 2010), (Seyfang & Smith, 2007)
	Failure to anticipate specific benefits and facilities for SI	(Mendes et al. , 2012), (Hubert 2011), (van der Geest& Heuts, 2008)
Administrative-structural barriers	Bureaucratic and inflexible structures	(Caulier-Grice et al., 2012), (Gouillart & Hallett, 2015)
	Lack of networking and creating interface institutions	(Chalmers, 2011), (Oganisjana et al., 2017), (Harayama & Nitta,2011), (Gouillart & Hallett, 2015)
	Lack of standard administrative processes and procedures for SI	(Mulgan, 2006), (Caulier-Grice et al., 2010), (Florida & Cushing, 2009)
	The size and complexity of the PS	(Mendes et al. , 2012), (Chalmers, 2011), (Fox et al. , 2019)
	Risk aversion of government organizations	(Caulier-Grice et al., 2012), (Chalmers, 2011), (Moore & Westley, 2011)
	Disagreeing Stakeholders and actors on a standard structure	(Millard & Carpenter, 2014), (Harayama & Nitta, 2011), (Gouillart & Hallett, 2022)
	Lack of organizational learning capacity at all levels	(Oganisjana et al., 2017), (Hougaard, 2014), (Gouillart & Hallett, 2022)
Cultural-educational barriers	Lack of proper media and advertising activities	(Brown & Wyatt, 2010), (Caulier-Grice et al., 2010), (van der Geest & Heuts, 2008)
	Lack of proper education system to empower citizens and agents	(Caulier-Grice et al., 2012), (Chalmers, 2011), (Hubert, 2011)
	Time-consuming to feel the effects of SI in the PS and society	(Mulgan, 2006), (Bureau of European Policy Advisers of European Commission, 2011), (Burt, 2004)
	Organizational culture against SI	(Mendes et al. , 2012), (Hubert, 2011), (Waasdorp & Ruiter, 2011)
	The culture of delegating matters to government agencies	(Mulgan, 2006), (Caulier-Grice et al., 2010), (Moore & Westley, 2011)
	Lack of demand for SI (lack of discourse)	(Hougaard, 2014), (Bureau of European Policy Advisers of European Commission, 2011), (Florida & Cushing, 2009)

Dimensions	Barriers and challenges	Sources
technology – data barriers	Lack of transparency and non-sharing of data and information	(Millard & Carpenter, 2014), (Gouillart & Hallett, 2022), (Seyfang & Smith, 2007)
	Lack of proper technology infrastructure	(Mulgan, 2006), (Chalmers, 2011), (Gouillart& Hallett, 2022)
	Lack of a clear system or mechanism for SI	(Oganisjana et al., 2017), (Caulier-Grice et.al, 2010), (Gouillart & Hallett, 2022)
	Insufficient and unreliable information about the effects of SI	(Millard & Carpenter, 2014), (Mendes et al., 2012), (Hubert, 2011), (Gouillart& Hallett, 2022)
Behavioral – Psychology barriers	Managers are not risk-averse	(Caulier-Grice et al., 2010), (Hougaard, 2014), (Harayama & Nitta, 2011), (Gouillart & Hallett, 2022)
	Old and traditional beliefs and ideas	(Mendes et al., 2012), (Brown, & Wyatt, 2010), (Hubert, 2011), (Burt, 2004), (Florida & Cushing, 2009)
	Low self-esteem and credibility to influence	(European Union & The Young Foundation, 2010), (Harayama & Nitta, 2011)
	The excessive expectation of the functional impact of SI	(Hougaard, 2014), (Mendes et al., 2012), (Chalmers, 2011)
	Partial and short-sighted thinking	(Caulier-Grice et al., 2010), (Oganisjana et al., 2017), (Gouillart & Hallett, 2022)

Source: Author's elaboration.

5.1. Quantitative step: Prioritization of barriers by fuzzy TOPSIS method

After identifying the barriers and finalizing them in the focus group stage, to prioritize the barriers and identify the basic and important barriers and challenges, the fuzzy TOPSIS method was used. The fuzzy TOPSIS method is one of the most popular and widely used multi-criteria decision-making methods to prioritize options while facing a fuzzy environment. Huang and Eun proposed this method in 1981. The principled logic of this model is to define the ideal or positive and perfect negative solutions. The ideal (positive) answer increases the profit criterion and decreases the cost criterion. The optimal option is the option that is closest to the ideal solution and, at the same time, is the forest from the negative ideal solution. That means, when prioritizing the options by the TOPSIS method, the choices with the most similarity with the ideal solution get a higher rank. The following steps of the fuzzy TOPSIS method and prioritized barriers and challenges are presented.

The questionnaire design in this research was based on a seven-spectrum, and the fuzzy spectrum was used, as shown below in Table 4.

Table 4. Verbal expressions in seven fuzzy spectrums of the questionnaire.

Code	Verbal expressions	Lower bound	Modal value	Upper bound
1	Very low	0	0	1
2	low	0	1	3
3	Medium to low	1	3	5
4	Medium to low	3	5	7
5	Medium to high	5	7	9
6	high	7	9	10
7	Very high	9	10	10

Source: Author's elaboration from Habibi et al. (2015).

The selection of experts was based on purposeful sampling. After identifying about 23 experts in the judiciary and SI field, 18 questionnaires were completed and received that could be analyzed. The frequency of experts and their expertise in completing the questionnaire is shown in Table 5.

Table 5. Frequency and expertise of experts completing the questionnaire.

Row	Expertise of experts	Number
1	Managers and administrative experts of the Judiciary	4
2	Judges and prosecutors	2
3	Specialists and professors in various fields of law	3
4	Professors and experts in the field of innovation and SI	2
5	Activists and thinkers, and executives in the field of SI	3
6	Specialists and experts in the fields of governance, sociology, policy-making and government management	4
	Total	**18**

Source: Author's elaboration.

For fuzzy analysis, first, the decision matrix was formed, which was somehow the arithmetic mean of the opinions of 18 selected experts. The following are the steps taken to implement the fuzzy TOPSIS barriers to SI in the judiciary system.

- *Step 1: Scale the decision matrix*

The following equations are used to scale (normalize) the decision matrix according to the positive and negative criteria.

$$\tilde{r}_{ij} = \left(\frac{a_{ij}}{c_j^*}, \frac{b_{ij}}{c_j^*}, \frac{c_{ij}}{c_j^*}\right) \quad ; \quad c_j^* = max_i \, c_{ij} \, ; \, positive \, criteria$$

$$\tilde{r}_{ij} = \left(\frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{a_{ij}}\right) \quad ; \quad a_j^- = min_i \, a_{ij} \, ; \, negative \, criteria$$

- *Step 2: Weighing scale decision matrix*

According to the weight of each criteria, the weighted decision matrix is calculated by multiplying the importance of each standard in the fuzzy unscaled matrix according to the following equation.

$$\tilde{v}_{ij} = \tilde{r}_{ij}.\widetilde{w}_{ij}$$

Where $\widetilde{w}_i$ represents the wight of the criterion   CJ.

- *Step 3: Find the ideal positive fuzzy FPIS, A^* solution, and ideal negative solution FNIS, A^-*

Positive and negative fuzzy ideal solutions are defined as follows:

$$A^* = \{\tilde{v}_1^*, \tilde{v}_2^*, ..., \tilde{v}_n^*\} = \left\{\left(\max_j v_{ij} \,|i \in B\right), \left(\min_j v_{ij} \,|i \in C\right)\right\}$$

$$A^- = \{\tilde{v}_1^-, \tilde{v}_2^-, ..., \tilde{v}_n^-\} = \left\{\left(\min_j v_{ij} \,|i \in B\right), \left(\max_j v_{ij} \,|i \in C\right)\right\}$$

A Where $\tilde{v}_i^*$ is the best value of I between all options and $\tilde{v}_1^-$ is the worst value between all options. B and C are the positive and negative criteria, respectively.

- *Step 4: Calculate the distance between the positive fuzzy ideal solution and the negative ideal solution*

The distance of each option from the ideal positive and negative solution can be obtained from the following relations, respectively:

$$S_i^* = \sum_{j=1}^n d(\tilde{v}_{ij}, {}^{\sim VJ^*})   \quad i=1,2,...,m$$

$$S_i^- = \sum_{j=1}^n d(\tilde{v}_{ij}, \tilde{v}_j^-)   \quad i=1,2,...,m$$

d is the distance between two fuzzy numbers that if (a_1, b_1, c_1) and (a_2, b_2, c_2) are two triangular fuzzy numbers, the distance between the two numbers is equal to:

$$d_v(\widetilde{M}_1, \widetilde{M}_2) = \sqrt{\frac{1}{3}[(a_1 - a_2)^2 + (b_1 - b_2)^2 + (c_1 - c_2)^2]}$$

Note that $d(\tilde{v}_{ij}, \tilde{v}_j^*)$ and $d(\tilde{v}_{ij}, \tilde{v}_j^-)$ are definite numbers. Table 6 shows the distance between the positive and negative ideals.

Table 6. Frequency and expertise of experts completing the questionnaire.

Barriers and challenges	Positive ideal distance	Negative ideal distance
Passivity in society for solving public problems	0.326	0.489
The dominance of political views instead of functionalist views in society	0.385	0.43
Institutionalizing the belief of not to have peoples participating throughout history (monarchy government)	0.398	0.416
The tradition of secrecy in the PS and the security and political Approach	0.274	0.538
The extreme monopoly of power in society	0.35	0.465
Lack of accessible communication in society and lack of reception of society to the experience and cooperation of others	0.328	0.49
Lack of formal laws and regulations for SI	0.362	0.457
Conflict of interest in implementing SI	0.386	0.428
Lack of infrastructure for intellectual property	0.352	0.463
Lack of legal guarantees in support of innovative ideas	0.355	0.462
Legal restrictions on the application of innovative approaches in the PS	0.404	0.413
Lack of designing new methods of financing in the PS	0.328	0.487
Lack of government funding	0.407	0.406
Lack of proper regulatory system for social innovators	0.194	0.619
Short-term budgets and short-term vision of officials	0.249	0.566
The difficulty of creating wealth from SI ideas in the PS	0.364	0.45
Reducing PS issues and challenges to structural and financial challenges	0.361	0.458
Lack of specific benefits and facilities for SI	0.431	0.387
Bureaucratic and inflexible structures	0.25	0.567
Lack of networking and creation of intermediary institutions	0.304	0.514
Lack of standard administrative processes and procedures for SI	0.355	0.46
The enormous size and complexity of the PS	0.343	0.469
Risk aversion of government organizations	0.266	0.548
Lack of Stakeholders and actor's agreement on a particular structure	0.312	0.505
Lack of organizational learning capacity at all levels	0.348	0.469
Lack of proper media and advertising activities	0.391	0.425
Lack of proper education system to empower citizens and agents	0.274	0.538
Too much time is needed for the effects of SI in the PS and society to be visible	0.43	0.386
Organizational culture against SI	0.361	0.454
The culture of Assigning the matters to government organizations	0.293	0.518
Lack of demand for SI (lack of discourse)	0.437	0.378
Lack of transparency and not sharing data and information	0.237	0.569
Lack of proper technology infrastructure	0.353	0.458
Lack of a transparent system or mechanism for SI	0.395	0.422
Insufficient and unreliable information about the effects of SI	0.376	0.445
Managers are risk-averse	0.285	0.533
Old and traditional beliefs and viewpoint	0.246	0.566
Low Self Confidence and lack of belief in the ability to influence	0.441	0.371
Excessive expectation from the functional impact of SI	0.505	0.307
partial and short-sighted thinking	0.361	0.456

Source: Author's elaboration.

- *Step 5: Calculate the ideal option similarity index and rank the options*

The similarity to the ideal option index is calculated from the following equation:

$$CC_i = \frac{S_i^-}{S_i^+ + S_i^-}$$

In this step, according to the degree of similarity to the ideal option index, the options are ranked so that the possibilities with the similarity to the ideal option index are given higher priority. The resemblance to the ideal option index of each option and their rank is specified in Table 7.

Table 7. Barriers and Challenges of SI with priority in the Judiciary.

Rank	Ci	Barriers and Challenges	Dimensions
1	0.761	Lack of proper regulatory system for social innovators	Legal- regulations barriers
2	0.706	Lack of transparency and not sharing data and information	technology - data Barriers
3	0.697	Old and traditional beliefs and viewpoint	Behavioral-Psychological barriers
4	0.694	Short-term budgets and short-term vision of officials	Economic-financial barriers
4	0.694	Bureaucratic and inflexible structures	Administrative-structural barriers
5	0.673	Risk aversion of government organizations	Administrative-structural barriers
6	0.663	The tradition of secrecy in the PS and the security and political Approaches	Institutional-political barriers
6	0.663	Lack of proper education system to empower citizens and agents	Cultural-educational barriers
7	0.652	Managers are risk-averse	Behavioral-Psychology barriers
8	0.639	The culture of Assigning the matters to government organizations	Cultural-educational barriers
9	0.628	Lack of networking and creation of intermediary institutions	Administrative-structural barriers
10	0.618	Lack of Stakeholders and actor's agreement on a particular structure	Administrative-structural barriers
11	0.6	Passivity in society to solve public problems	Institutional-political barriers
12	0.599	Lack of accessible communication in society and lack of reception of society to the experience and cooperation of others	Institutional-political barriers
13	0.598	Lack of designing new methods of financing in the PS	Economic-financial barriers
14	0.578	The enormous size and complexity of the PS	Administrative-structural barriers
15	0.574	Lack of organizational learning capacity at all levels	Administrative-structural barriers
16	0.57	The extreme monopoly of power in society	Institutional-political barriers
17	0.568	Lack of infrastructure for intellectual property	Legal-regulations barriers

Rank	Ci	Barriers and Challenges	Dimensions
18	0.565	Lack of legal guarantees in support of innovative ideas	Legal-regulations barriers
19	0.565	Lack of proper technology infrastructure	technology - data Barriers
20	0.564	Lack of standard administrative processes and procedures for SI	Administrative-structural barriers
21	0.56	Reducing PS issues and challenges to structural and financial challenges	Economic-financial barriers
22	0.558	Lack of formal laws and regulations for SI	Legal-regulations barriers
22	0.558	partial and short-sighted thinking	Behavioral-Psychological barriers
23	0.557	Organizational culture against SI	Cultural-educational barriers
24	0.553	The difficulty of creating wealth from SI ideas in the PS	Economic-financial barriers
25	0.542	Insufficient and unreliable information about the effects of SI	technology – data Barriers
26	0.528	The dominance of political views instead of functionalist views in society	Institutional-political barriers
27	0.526	Conflict of interest in implementing SI	Legal-regulations barriers
28	0.521	Lack of proper media and advertising activities	Cultural-educational barriers
29	0.517	Lack of a transparent system or mechanism for SI	technology – data barriers
30	0.511	Institutionalizing the belief of people not participating throughout history (monarchy government)	Institutional-political barriers
31	0.505	Legal restrictions on the application of innovative approaches in the PS	Legal -regulations barriers
32	0.499	Lack of government funding	Economic-financial barriers
33	0.473	Lack of specific benefits and facilities for SI	Economic-financial barriers
33	0.473	Too much time is needed for the effects of SI in the PS and society to be visible	Cultural-educational barriers
34	0.464	Lack of demand for SI (lack of discourse)	Cultural-educational barriers
35	0.457	Low Self Confidence and lack of belief in the ability to influence	Behavioral-Psychological barriers
36	0.378	The excessive expectation of the functional impact of SI	Behavioral-Psychological barriers

Source: Author's elaboration.

6. Conclusions

Global conditions and developments have made it impossible for the government to solve many malignant political challenges and issues by relying only on the administrative and executive bodies. In such circumstances, using people's capacity in new approaches and mechanisms such as SI is necessary to empower the government sector to provide services and improve citizen satisfaction efficiently. This study found that applying SI in the PS is not easy and uncomplicated in practice, and there are various institutional, political, administrative, legal, etc., barriers and challenges. Reviewing the literature and holding a focus group interview session identified 40 barriers and challenges in 7 categories. In the next stage, barriers were

prioritized by designing a questionnaire and using the TOPSIS method. Data and information sharing, old and traditional beliefs and viewpoints, short-term budgets and short-term vision of officials, bureaucratic and inflexible structures, and risk aversion of government organizations were significant barriers and challenges to implementing SI in the judiciary system.

In prioritizing the challenges, it was found that institutional-political barriers are less limited in implementing SI in the Judiciary. In other words, the institutional-political context of Iran can be a facilitator in the implementation of SI. On the other hand, the majority of priority challenges and barriers are administrative-structural, technological-data, and behavioural-psychological, which indicates that policymakers and decision-makers should eliminate administrative, behavioural, and technological difficulties to expand the implementation of the SI approach in the Judiciary.

Compared to previous studies, it should be noted that in the TEPSIE project, SI barriers were classified into structural and agency barriers (characteristics of individuals and agents) (Mendes et al., 2012). In this study, structural-administrative barriers and behavioural-psychological barriers were identified as barriers with higher priority. In the study of Ramdani et al. (2020), financial issues, governance, skills, and measuring innovation were the main challenges of SI in the PS (Ramadani et al., 2020). While in the present study, financial and economic issues were not recognized as high-priority barriers. Oganisjana et al. (2017) listed lack of funding, passivity in society, administrative and bureaucratic barriers, and institutional challenges as barriers to SI in the PS (Oganisjana et al., 2017). This is similar to this study's emphasis on managerial and bureaucratic barriers. Compared to the Hoggard (2014) matrix, which identified social barriers to formal or informal barriers at the individual or social level. It turns out that standard social-level barriers in the present study are similar to structural-administrative and technological-data barriers with a higher priority (Hougaard, 2014).

The present study was conducted to prioritize barriers to SI in the Judiciary. The most important recommendation for future research is to conduct research to identify existing barriers and design tools and mechanisms for achieving SI in the Judiciary. Some of the most important policy recommendations for removing SI barriers in the PS, and particularly the judiciary system, are as follows:

- Utilizing the capacity of Judiciary Research and Innovation Centers such as Judiciary Research Institute and Legal Innovation Center to regulate the field of SI and facilitate implementation of SI in the Judiciary.
- Develop guidelines and regulations for data management and citizen access to data to determine the scope of citizen participation in the judiciary affairs to realize the approach of SI and provide innovative and practical policy solutions.
- Employing efficient and creative managers of the well-known private sector who are active in the field of SI as advisors to the judiciary system so that the managers would be familiar with the areas of SI and use SI to solve old challenges of the Judiciary.
- It is necessary to design hybrid structures independent from the current and traditional bureaucracy of the administrative system of the Judiciary to carry out development and promotion to strengthen the use of public capacity and NGOs in the field of SI, especially in the field of social crime prevention in cooperation with the Judiciary administration for Crime Prevention.
- It is necessary to discover new financing methods, such as using the social responsibility money from private sector companies to hold SI events in the judicial sector to resolve judicial processes and procedures.

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