

## Meta-synthesis of Technology and Innovation Foresight Models in Health and Hospital Industry Management

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### Abstract

**Objective and background:** The importance of technology and innovation foresight in the health and hospital industry management as one of the important tools in policy intelligence is increasingly revealed. Although theoretical research and practical efforts are not very old in the area of foresight, lack of comprehensiveness of existing models highlights the necessity of integrating the issues raised.

**Methods:** In the present study, to achieve a comprehensive model for technology and innovation foresight in the health and hospital industry management, a systematic qualitative research method is used to systematically review the research findings in this area to explore the approaches and principles of these models after extracting the main themes. To achieve this goal, 70 articles published in electronic databases such as Emerald and Elsevier, etc. were reviewed through the Google Scholar search engine between the years 1990 and 2021. After screening, 35 articles were selected for work, open coding tools were used to analyze the articles. In the next step a descriptive analysis using the Preferred Reporting Items for Systemic View and Meta Analysis protocol proposed and the then developed proposition based on keywords analysis.

**Results:** By reviewing 70 final articles, researchers identified 3 dimensions and 12 categories as the factors affecting the use of foresight models in health industry management with the aim of innovation and technology development. Key themes included networking among inclusive actors, comprehensiveness of foresight programs, and utilization of foresight output data in the health and hospital industry management. The main themes obtained in this study are in line with approaches to the phenomenon of technology and innovation foresight in the health and hospital industry management adopted by scientists in this area.

**Conclusion:** These main approaches include conceptualization, history and evolution, differentiation from other aspects of foresight, types of classifications (based on geography, thematic and applied orientation, and foresight generations), and types of frameworks, methods and techniques used, communication with policy-making and strategy determination.

**Keywords:** Foresight, Technology and Innovation Foresight, Health Industry Management; Meta-Synthesis, Hospital, Meta-Analysis.

### Objective and background

Foresight is used as a subset of futures research for a wide range of individual, organizational, and governance studies. The starting point of the future research paradigm in planning is the need to move from forecasting to identifying and creating multiple possible futures. The availability of alternative futures provides agility and flexibility in planning and evaluating the organization's strategy<sup>1</sup>. Technology and innovation foresight in health and hospital industry management is an organized, purposeful, participatory and continuous process that helps policymakers to achieve the greatest economic and social benefits through creating communication, coordination and collaboration among different organizations and institutions in various areas of science, technology, economics and environment by developing mid-term and long-term plans<sup>2</sup>. Several models for foresight have been proposed so far and the aim of this study is a comprehensive analysis and identification of the main themes of emergence of these models and evaluation of the relationship between them to determine the main themes for developing a successful model.

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Using a meta-synthesis method, we could identify three main themes based on the use of open coding tools in technology and innovation foresight models in health and hospital industry management, each of which includes sub-themes. Main themes include: a) Networking among inclusive actors with sub-themes of creating a common sense of commitment among actors, finding and gathering stakeholders and experts, creating common views and wisdom in an uncertain environment, extracting tacit knowledge of experts to manage innovation in hospital, B) comprehensiveness of foresight programs with sub-themes of degree of being normative or exploratory, simultaneous attention to scientism versus technologism, attention to context including socio-economic factors, etc., having a systematic view of the long-term future, and considering three steps of pre-foresight, foresight and post-foresight, and C) utilizing of foresight output data with sub-themes of identifying innovative research priorities and strategic research areas, foresight as a policy tool, establishing a balance between future needs and current investment in R&D, and achieving science and technology alignment. The following section provides a review of previous research. Third section describes the methodology used in this study. Fourth section analyzes the result of the meta-synthesis method, and finally, final section summarizes and concludes the results.

Foresight is a systematic tool for identifying and evaluating those scientific and technological advances that can have many

impacts on industrial competitiveness, wealth creation and quality of life. Foresight in hospital management seeks to discover possible futures and increase flexibility in strategy and implementation, and create alternative perspectives. Foresight seeks to receive signs of change, especially in the fields of science, technology and innovation in the health and hospital industry management<sup>3</sup>.

Technology and innovation foresight in the health and hospital industry management are mostly organized in the form of special initiatives and gathers different stakeholders in a specific way (according to conditions) instead of addressing the existing decision-making models. This diversity of performance style is important, since it prevents the institutionalization of input of strategic intelligence into the policy system (dependence on a particular stakeholder or political interest)<sup>4</sup>. There are various goals for foresight in the health and hospital industry management, some of which are identifying technologies and innovations, developing priorities, discovering and building possible futures, expanding and deepening visions and perspectives, and compliance with capabilities needed to reduce the effects of negative outcomes and maximize positive outcomes<sup>5</sup>. Foresight implementation in hospital management is relatively varied according to the type of study. Also, diversity of topics and the type of field of study determine the framework of the foresight process<sup>6</sup>. Accordingly, some common models in the area of foresight can be categorized as follows in (Table 1).

**Table 1.** Technology and innovation foresight models in health and hospital industry management

Model name	Descriptions
Martin model <sup>7</sup>	This model consists of three steps: pre-foresight, foresight in main hospital management, and post-foresight
Voros model <sup>8</sup>	This model has four steps of inputs, process, outputs and strategies
Miles model <sup>9</sup>	Unlike other models, which is a hierarchical process, this model has an iterative process, and in each iteration, the previous results are updated. This model has steps of foresight, employment, creation of image of future, and implementation
Reger model <sup>10</sup>	It consists of 7 main steps, including determining the field of research and information focused

Model name	Descriptions
	on it; determining information sources, methods and tools; data collection; screening, analysis and interpretation of results; preparation of decisions; Evaluation and decision making; and implementation
Popper model <sup>11</sup>	This model has five steps of foresight, application, creation, action, and revision
Horton model <sup>12</sup>	Horton believes that foresight is the process of developing future development strategies that proper understanding of them will lead to making the right decisions to build the desired future. This model includes the steps of input, implementation, and output
Saritas model <sup>13</sup>	The difference between Saritas model and other models is the attention to context in the implementation of foresight programs in hospital management.
UNIDO model <sup>14</sup>	In this model, 12 factors are proposed as the main components of the foresight program: optimal results, audience, resources including human resources, financial, time, political, economic, social and cultural environments, starting point, time horizon, thematic scope, organization and management, participation, methods, output and policy-making actions
Keenan model <sup>6</sup>	15 important elements in implementing foresight activities in hospital management from Keenan's point of view are: rational principles, goals, review of existing executive approaches, orientation, level, time horizon, thematic scope, participation, consulting, period and cost, methods, organization and management , publication, implementation and evaluation

As mentioned, the objective of this study is to identify the main themes of emergence of foresight models in hospital management and to develop analysis and interpretations related to the characteristics of each model. The conceptual theory allows the researcher to see the specific factors that are crucial in supporting a hypothetical argument. Furthermore, the conceptual Model consists of particular dimensions that justify the critical conditions and are conceived as an imperative for estimating a logical interpretation for developing practical relevancy. The conceptual model suggested in this research assesses the potential capabilities that directly influence generic R&D characteristics. Since, author is aware of the reality that the significant output during the assessment depends upon three influential factors: technology, knowledge and innovation management with unusual interrelation conditions, which were also observed during the systematic review of the literature.

## Method

In terms of methodology, since meta-study methods have been less used by researchers, this research can be considered innovative.

In selecting top 35 articles, the focus was on applied articles. However, expanding the scope of articles both in terms of number and in terms of e period before 1990 can enhance the richness of content. The combination of previous studies in a specific area with systematic scientific solutions has nowadays been very popular primary due to expansion and disconnection of those studies<sup>7</sup>. Meta-synthesis can be considered as one of the four meta-study methods. In general, the methods classified in the area of meta-study analyze the research work done in a specific area. One classification includes meta-method, meta-analysis, meta-theory and meta-synthesis<sup>8</sup>. Meta-synthesis, like meta-analysis, focuses on the results of previous studies, with the difference that in meta-synthesis, qualitative methods are used to analyze previous data and generate new knowledge<sup>15</sup>.

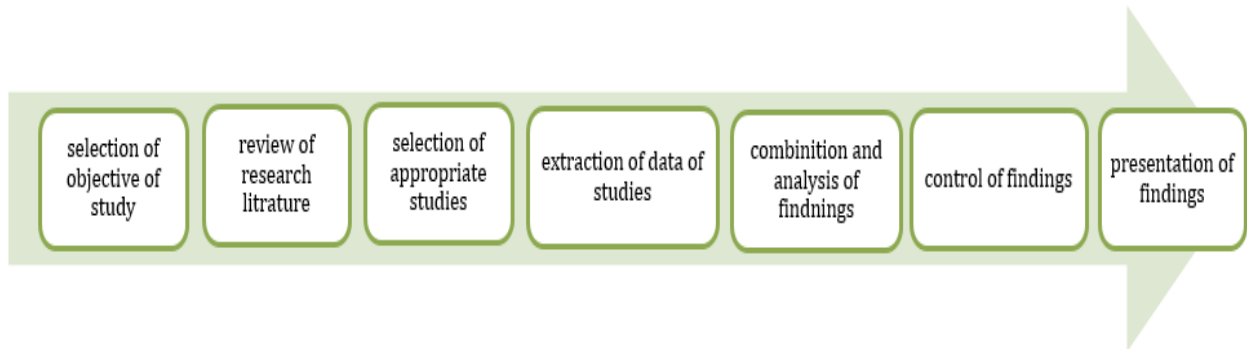
## Analysis of information obtained by meta-synthesis method

### Objective selection

According to the Horton<sup>12</sup> method (Figure 1), the first step in implementing meta-synthesis is to determine the main objective of the research. This article considers the

use of web data for scenario development. Generally, the two aspects of collecting data for scenarios are participatory approaches (e.g., workshops, interviews, and webinars) or desk research (articles and magazines), which mainly are focused based on the keywords. Bibliometric interpretations based on PRISMA with a co-word analysis technique were applied in this research.

Such extensive research helps the author to investigate the existing studies, gauging the number of published research articles within the domain of specific topics. The extraction of some of the emerging dimensions depends upon reliable sources. In the case of this research, the Scopus database allows the extraction of some of the emerging themes within the scope of a given research domain.



**Figure 1.** Steps of the meta-synthesis method

## Results

Since statistical population and sample in the meta-synthesis method are the previous research on the subject, selection of appropriate articles in the meta-synthesis method has a particular importance. In this study, 200 related articles published since 1990 to 2021 were selected among publications in reputable electronic databases such as Emerald, Elsevier, Science Direct, Taylor and Francis, etc., as well as websites and conferences using the Google Scholar search engine and reviewed. Finally, 35 articles were selected according to (Table 2) and (Table 3). The words used in the search are as follows:

Foresight, Foresight Model, Foresight Process, Foresight Methods, Foresight Methodology, Technology Foresight, Strategic Foresight, National Foresight, Foresight Scenario Planning, Foresight Insight, Successful Foresight, Competitive Foresight, Managerial Foresight, Foresight Potential, Perfect Foresight, Comparing Foresight, Integrated Foresight, Entrepreneurial Foresight, Foresight Impact, Social Foresight, Corporate Foresight, Combined Foresight model, Fiscal Foresight, Evolution of Foresight, Dynamic Foresight, Foresight Perspective.

**Table 2.** List and frequency of used journals

Row	Journal	frequency
1	Technological Forecasting and social change	16
2	foresight	6
3	Technology analysis & strategic management	3
4	Futures	2
5	Long Range Planning	1
6	Research Evaluation	1
7	Journal of Futures Studies	1

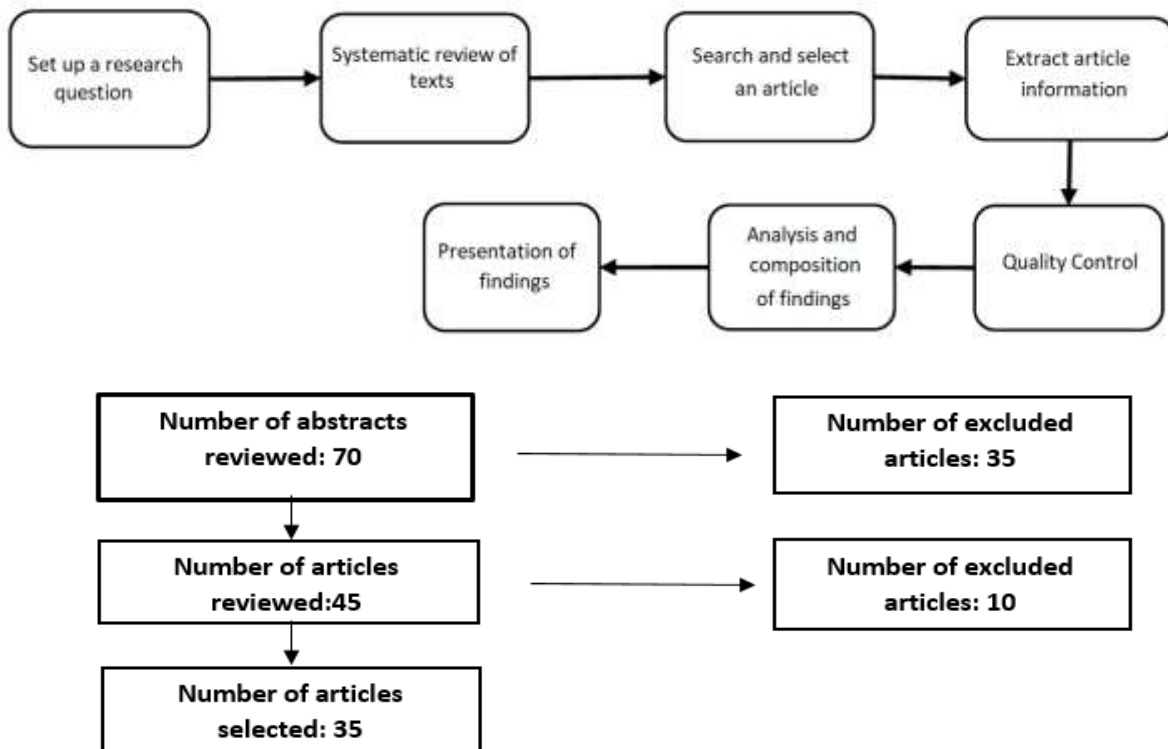
Row	Journal	frequency
8	Management of Environmental Quality	1

**Table 3.** List of referenced specialized websites and conferences

Row	website	frequency
1	CeON Repository	1
2	ec. Europa. eu	1
3	The second international conference on technology	1
4	ERC Working Papers	1

To evaluate and screen the articles in this research, the method of critical evaluation skills program was used, as shown in (Figure 2). In addition to displaying the differences between different studies, meta-synthesis explains the relationship between them<sup>16</sup>. In meta-synthesis, instead of identifying and classifying the theoretical literature in a field, we classify, analyze, and interpret the findings of past studies<sup>17</sup>. Meta-synthesis helps to grow knowledge by discovering new sub-themes and main themes and gives a more comprehensive view. As mentioned, meta-synthesis

methodology is mostly used in sciences that are based on qualitative studies. Moreover, in studies related to foresight in health and hospital industry management, qualitative methods always have a special place, so the meta-synthesis method can be used as a suitable tool to obtain a comprehensive combination of foresight models and extract main themes and sub-themes of formation of foresight models. Several methods have been proposed so far to use meta-synthesis. In this study, a seven-step method was used<sup>18</sup>.



**Figure 2.** Method of selection of articles

### Extracting concepts from articles

Based on the 35 final articles selected from 1990 to 2021, the process of extracting information from the results and analyses of these articles was performed. Accordingly, open coding method, as one of the most common methods of qualitative data analysis, was used. In the open coding method, the codes are extracted from the text and then the coding is done to form different concepts and categories (text, code and concept).

In meta-synthesis, the goal is to reach the main themes, which consist of a number of sub-themes<sup>19</sup>. Sub-themes were

systematically identified based on reviewed articles on technology and innovation foresight models in healthcare and hospital management. In the final step, these sub-themes were combined. The main themes include categories and sub-areas that are more highlighted and can be compared and combined in articles<sup>20</sup>. (Table 4) and (Table 5) show the coding. As seen, 35 selected articles are marked with code A. The method of coding the main themes and sub-themes is in this way that, for example, Code A27-24 represents the fourth sub-theme of the second main theme in Article 27.

**Table 4.** Main themes with their related sub-themes

Main themes	Theme 1: Networking among inclusive actors	Theme 2: Comprehensiveness of foresight programs	Theme 3: Utilization of foresight output data
Sub-themes	1. Creating a common sense of commitment among the actors 2- Finding and gathering stakeholders and experts 3. Creating a common perspective and wisdom in an uncertain environment 4- Extracting the tacit knowledge of experts to manage innovation in the hospital	1- Degree of being normative or exploratory 2. Simultaneous attention to scientism versus technologism 3- Paying attention to the context, including socio-economic factors, etc. 4- Having a systematic view of the long-term future 5-Considering the three steps of pre-foresight, foresight in hospital management and post-foresight	1- Identifying innovative research priorities and strategic research areas 2. Foresight as a policy tool 3. Establishing a balance between future needs and current investment in research and development 4- Achieving science and technology alignment

**Table 5.** Extracting main themes (concepts) and sub-themes (codes) from selected articles

code	Article main theme	Strategy	Theme 1	Theme 2	Theme 3
A1	Induced technological change in a limited foresight optimization model <sup>21</sup>	External Knowledge Source	A1-12	A1-22, A1-23	A1-32, A1-34
A2	Technology foresight for competitive advantage <sup>22</sup>	Project Management	A2-13, A2-14	A2-21	A2-32
A3	National Technology Foresight Activities Around the Globe: Resurrection and New Paradigms <sup>23</sup>	Innovative Performance	A3-11	A3-21, A3-25	A3-33
A4	Foresight as a core competence <sup>24</sup>	Innovation strategies & initiatives	A4-12, A4-14	A4-22	
A5	Technology Foresight for Wiring Up the National Innovation System <sup>25</sup>	Technology Trends	A5-11		A5-21, A5-24
A6	The development of technology foresight A review <sup>26</sup>	Intellectual Property Performance		A6-25	A6-31, A6-32, A6-34

code	Article main theme	Strategy	Theme 1	Theme 2	Theme 3
A7	Current Foresight Activities in Central Europe <sup>27</sup>	Strategic Technology Technologic		A7-21, A7-22, A7-24, A7-25	
A8	How are foresight methods selected? <sup>28</sup>	al performance	A8-14		A8-31
A9	Foresight in science and technology <sup>29</sup>	Corporate Technology Strategic	A8-13	A9-24, A9-25	
A10	Evaluation of national foresight activities: Assessing rationale, process and impact <sup>30</sup>	Technology Road Mapping	A10-13	A10-24	
A11	foresight methodology Training Module <sup>31</sup>	Knowledge Sharing	A11-11, A11-12		
A12	A generic foresight process framework <sup>32</sup>	Open Innovation	A12-13	A12-21	
A13	Appraisal of alternative methods and procedures for producing Regional Foresight <sup>33</sup>	Technologic al performance	A13-13, A1-12		
A14	A simple guide to successful foresight <sup>34</sup>	External Knowledge Source	A14-13		A14-31
A15	Technology foresight in companies: from an indicator to a network and process perspective <sup>35</sup>	Innovation strategies & initiatives	A15-22	A15-11	A15-34
A16	The impact of foresight on innovation policy-making: recent experiences and future perspectives <sup>36</sup>	Innovative performance	A16-11, A16-13	A16-24	A16-32
A17	Interpreting foresight process impacts: steps towards the development of a framework conceptualizing the dynamics of 'foresight systems' <sup>37</sup>	Innovation strategies & initiatives	A17-11, A17-13		A17-32
A18	National foresight in science and technology strategy development <sup>38</sup>	Technology trends assessment		A1-25	A18-31
A19	Swedish Technology Foresight-a successful project, with many lessons learned <sup>39</sup>	Organization strategy	A19-11, A19-13		A19-14
A20	Assessing immediate learning impacts of large foresight processes <sup>40</sup>	External Knowledge Source		A20-12	A20-32
A21	Turkey's national Technology Foresight Program: A contextualist analysis and discussion <sup>41</sup>	Innovation strategies & initiatives	A21-14	A21-11	A21-32
A22	Technology Foresight for Strategic Decision-Making <sup>42</sup>	Strategic Technology Road Mapping	A22-13	A22-21, A22-23	
A23	Foresight Maturity Model (FMM): Achieving best practices in the foresight field <sup>43</sup>	Foresight Maturity Model			A23-31, A23-34
A24	Innovation system foresight <sup>44</sup>	Innovation strategies & initiatives	A24-11	A24-23	
A25	IT tools for foresight: The integrated insight and response system of Deutsche Telekom Innovation Laboratories <sup>45</sup>	Tacit Knowledge	A25-13	A25-22	A25-14
A26	Integrated roadmaps and corporate foresight as tools of innovation management: the case of Russian companies <sup>46</sup>	Codification	A26-14, A26-12		A26-31
A27	Foresight in a small enterprise. A case study <sup>47</sup>	Success rate		A27-22	A27-31

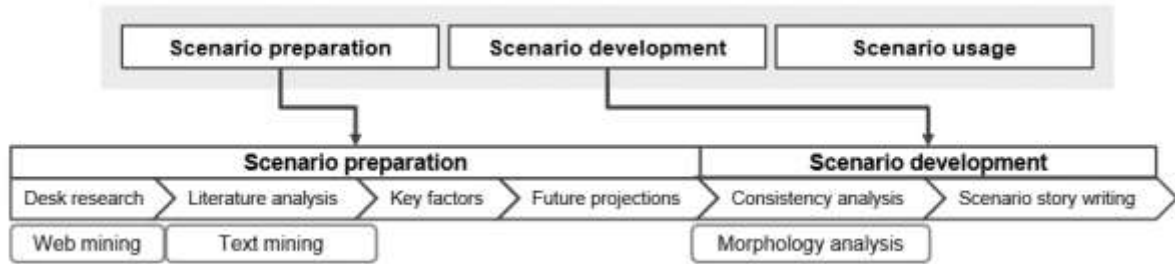
code	Article main theme	Strategy of R&D products	Theme 1	Theme 2	Theme 3
A28	The role of corporate foresight in exploring new markets—evidence from 3 case studies in the BOP markets <sup>48</sup>	Market technology and business management	A28-13, A28-14		A28-34
A29	Interactive foresight on the Hungarian SMEs <sup>49</sup>	Innovation strategies & initiatives	A29-11, A29-13	A29-21	A29-33
A30	Strategic foresight for collaborative exploration of new business fields <sup>50</sup>	innovation foresight	A30-12		A30-31
A31	Text mining as a valuable tool in foresight exercises: A study on nanotechnology <sup>51</sup>	Technology foresight	A31-12	A31-22	A31-33
A32	The Organization of Corporate Foresight: A multiple case study in the telecommunication industry <sup>52</sup>	Organization strategy	A32-14	A32-23	A32-33, A32-34
A33	An overview of foresight methodologies <sup>53</sup>	-	A33-11, A33-13	A33-21	A33-33
A34	Strategic foresight la prospective <sup>54</sup>	Innovation strategies & initiatives	A34-12	A34-24	A34-32
A35	The art of scenarios and strategic planning: tools and pitfalls <sup>55</sup>	Foresight Maturity Model; Innovation strategies & initiatives	A35-13	A35-24	A35-31, A35-32

As observed, three main themes were identified in relation to a variety of technology and innovation foresight models in the health and hospital industry management. In this section, by in-depth examining of these themes, along with sub-themes of each of them, we will explain the relationship between these themes and the whole subject matter in the existing research literature, to gain better understanding of the nature of technology and innovation foresight models in health and industry management.

As shown in figure 3, an established foresight method, scenarios serve as a framework to think about possible future developments in order to derive robust

strategies<sup>13</sup>. Many different scenario approaches exist, and the scenario processes can be aggregated into three steps<sup>14</sup>. After setting the scope and purpose of the project, information is needed on the subject of interest in the first step. Hence, a deep knowledge and understanding of the scenario field are most relevant for the success of the process<sup>56</sup>. The insights are aggregated to influence factors (e.g., market, privacy). Next, future alternatives are formulated for each factor. In the second step, the interdependencies between the alternatives are analyzed, in order to draw consistent future scenarios. In the third step, the scenarios are applied in areas such as strategy development.





**Figure 3:** foresight method scenario

Main theme 1: It is networking among all-inclusive actors. As shown in (Table 4), its sub-themes include creating a common sense of commitment among actors, finding and gathering stakeholders and experts, creating a common perspective and wisdom in an uncertain environment, and extracting the tacit knowledge of experts to manage innovation in the hospital. Desired policy intelligence results from the integration of several influential components including foresight, having a shared perspective and vision, having systemic thinking skills, motivation, participation and sharing, and hospital management. The main threat to the realization of strategic intelligence is the existence of a mission and technological gap between these components, as well as the lack of a common literature among knowledge capitals. Created collective wisdom in addition to covering these gaps will also bring integrity, agility and flexibility to the organization. It should be noted that, unlike traditional view, there is no central place for technological innovation, and much of the innovation occurs in networks and organizations, not in specific companies or research and development laboratories. Thus, the distributed nature of innovation has led to the formation of a very complex and unstable image of successful innovations and inventions. Most applications of science and technology (related to politics) affect a wider society. Thus, different stakeholders in society should be able to negotiate on the risks and consequences of leading policies and theorize the perceived priorities. Foresight is also an important tool for intervention in the area of technology and

innovation and makes technology policy-making smarter. Thus, foresight in hospital management can be considered as an integral part of network and distributed policy, and three main functions of policy informing, participation in policy-making, and facilitation of policy implementation have been identified for it in this regard<sup>57</sup>.

Main theme 2: It is Comprehensiveness of foresight programs. As shown in (Table 5), it include sub-themes of degree of being normative or exploratory, simultaneous attention to scientism versus technologism, attention to context including socio-economic factors, etc., having a systematic view of the long-term future and considering three steps of pre-foresight, foresight, and post-foresight. As<sup>19</sup> has stated, foresight in hospital management is a systematic process with a long-term view in the fields of science, technology, economics, and society that aims to determine areas of strategic research and design and develop emerging technologies with the greatest social and economic benefits. Attention to cultural, social and economic contexts in the long-term has always been emphasized by scientists in the field of technology and innovation foresight in the health and hospital industry management<sup>58</sup>.

Main theme 3: It is utilization of foresight output data. As shown in (Table 5), it include sub-themes of identifying innovative research priorities and areas of strategic research, foresight as a policy tool, establishing a balance between future needs with current investment in research and development, and achieving science and technology alignment. Foresight is a

collaborative approach for creating long-term perspectives and visions to inform decision-making processes<sup>59</sup>. In some studies, the effects of foresight activities in health industry management have been presented in the form of categories such as increasing knowledge, forming related views and ideas and actions. Some scholars in this field believe that foresight programs are usually measured in terms of achieving the initial goals and their expected impacts. These outcomes and impacts are related to the expectations of the foresight process in the health and hospital industry management and the method based on which it is designed and implemented, and they are placed usually in areas such as knowledge creation, dissemination and absorption, capital and social network, and strategies<sup>60</sup>.

## Conclusion

In most recent studies, extensive bibliometric analyses related to technology management (TM) have been performed to represent general trends of TM<sup>34</sup>. Many studies highlight specific research areas adjacent to technology management. For instance, Anderson<sup>43</sup> applied a co-citation strategy to identify the fundamentals of IS (information system) and canvases the area of research to create resemblance to an information system rather than to organizational learning. Similarly, Björn and Lübeck<sup>39</sup> investigated the pillars of the sociology of science literature and identifies the unique relationship between information scientists and sociologists, who share creative ideas only when they scholarly interact with each other. As approved in the Battistella and Change<sup>44</sup>, the results revealed that the cooperation structure and interaction among the network members possess the highest importance in designing an innovation network. The meta-synthesis method in this study is based on the extraction of 70 articles published in the electronic databases of Emerald and Elsevier, etc. from 1990 to 2021. After

screening, 35 articles were selected for work. Open coding tool was used to analyze the articles. Finally, 3 main themes and their sub-themes were identified. Main themes include networking among inclusive actors, comprehensiveness of foresight programs, and utilization of foresight output data.

As seen in describing each theme, by comparing the main themes and sub-themes obtained in this meta-synthesis research with other previous studies<sup>8, 9</sup> in the field of technology and innovation foresight in health and hospital industry management, many similarities can be found. The main themes obtained in this research are in line with the approaches to the phenomenon of technology and innovation foresight in health and hospital industry management by scientists in this field. These major approaches include conceptualization, history and evolution, differentiation from other aspects of futurology, types of categories (based on geography, thematic and applied orientation, and foresight generations), types of frameworks, methods and techniques used, communication with policy-making and strategy determination. It should be noted that lack of coverage of some of the concepts in the above approaches could be found in screening of some articles related to general approaches such as conceptualization, history and evolution, types of classifications, and so on. Future research efforts began in the sixth decade of the twentieth century. Despite the efforts of administrative scientists, based on the literature review findings<sup>13, 22</sup>, it has been neglected a practical solution, especially in developing countries. Therefore, more attention should be paid to it. Foresight in the science and technology hospital management can be considered simultaneously at both the enterprise and government levels. Although research efforts have been focused more on the government sector, studies<sup>45</sup>. Conway and Futures<sup>51</sup> show that at the enterprise level, it can be used as an effective tool in the current uncertain and competitive

environment. Extensive studies have been conducted in the area of combining foresight with hospital management and extracting a tool called strategic foresight, which has resulted in significant models. The innovation used in this article can be examined both in terms of subject matter and content and in terms of methodology. In terms of the subject matter and content of this article, it is in the class of limited efforts, in which the aim was pursuing foresight at both levels of enterprise and government, and having a superficial look at it by observing the differences between them. Also, in terms of methodology, since meta-study methods have been less used by researchers, this research can be considered innovative. In selecting top 35 articles, the focus was on applied articles. However, expanding the scope of articles both in terms of number and in terms of e period before 1990 can enhance the richness of content.

### Competing Interests

The authors declare no competing interests

### Authors' contributions

The authors are the same

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