

## A STUDY ON THE METHODOLOGY FOR SOLVING SOCIAL PROBLEMS THROUGH LITERATURE REVIEW

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**ABSTRACT.** *Many researchers in various fields are seeking solutions to social problems through political and administrative measures; however, concrete solutions have yet to be presented. Further, our society offers solutions for its problems by considering its type of social issues. In other words, to solve the problems, rather than examining general-problem solutions, society should investigate the characteristics of social problems. In this study, we undertook a literature review and analyzed the methodologies for solving social problems. The classification of social problems was then further subdivided into categories for academic purposes and those applicable to national policies. Finally, I developed a methodology process for social solutions.*

**Keywords:** Social issues, Problem solving method, Social problems

**1. Introduction.** The quality of life for South Korean citizens is currently deteriorating due to growing social problems related to disasters, crime prevention and response, environmental pollution, food systems, etc. Therefore, the need for studies on how to solve such social problems is gradually increasing. With that aim in mind, the South Korean government undertakes political studies, providing support for the development of social services and technologies. The government, however, faces difficulties in delivering any meaningful support, due to limited social service facilities, and in providing human resources. Therefore, this study investigates procedures and methodologies to overcome such limitations and effectively solve the country's social problems by analyzing previous, relevant research and utilizing smart technologies that are already omnipresent in citizens' lives. To this end, this paper analyzes flexible response methods for problem solving to develop a methodology for solving social problems.

In this paper, we suggest the conceptual model in Figure 1 for solving social problems, using science and technology.

### 2. Analysis of Previous Research.

**2.1. The characteristics and definition of a problem.** According to Dictionary.com, a problem is defined as “a question proposed for solution [1]”. Further, Spradlin suggested that “Well-defined problems lead to breakthrough solutions” in *Harvard Business Review* [2]. This means that to solve a problem, it must be clearly described and the approach to finding its solution fully understood.

### 2.2. Methods to problem solving.

#### (1) Explorative technique

The explorative technique refers to a method that starts with no particular goals for addressing social needs but gradually establishes objectives during the development process. Alternatively, an objective is established at the beginning and developed through simple repetition or a trial-and-error process.

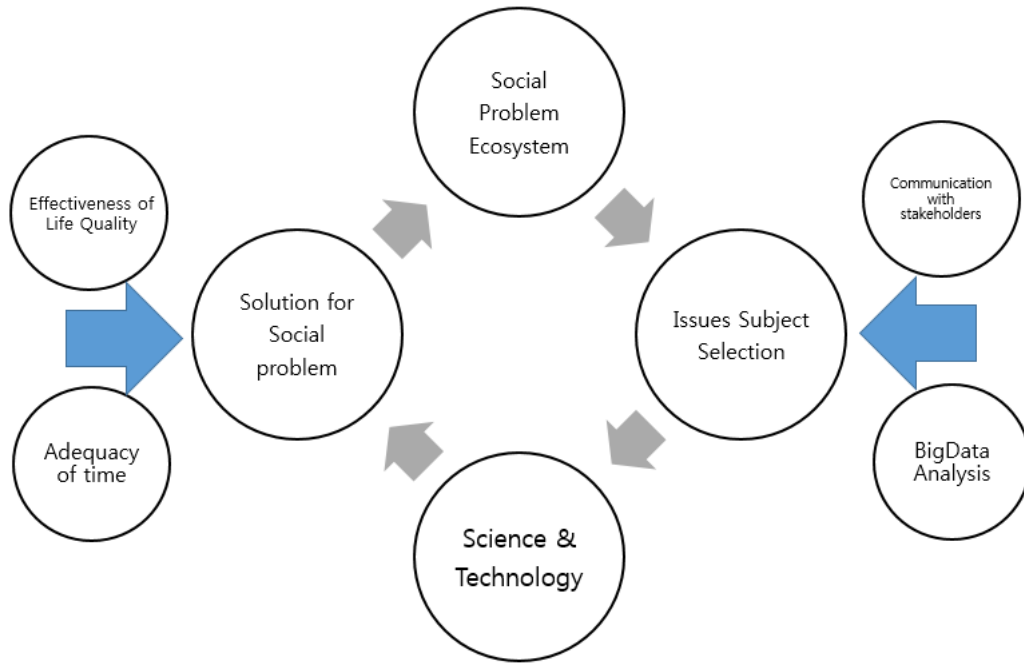


FIGURE 1. Conceptual model for solving social problems using science and technology

(2) Normative technique

The normative technique is based on system analysis, starting with the need to verify a method and the actions required to satisfy those needs.

(3) Method analysis for problem solving

Problem solving involves at least three different dimensions: (a) problem variations, (b) problem representation, and (c) individual differences. As mentioned earlier, problems vary depending on their complexity and abstractness; problem representation by context and modality; while a range of differences mediate individual abilities to solve problems.

TABLE 1. Problem-solving skills

Problem Variations (a)	Representation (b)	Individual Differences (c)	Problem-solving skill
Complexity Abstractness/ situatedness	Context (social, historical, cultural) Modality	Structural knowledge Procedural knowledge Cognitive styles General problem-solving strategies	

**2.3. Problem occurrence type and solution method.** In his book, Takasugi [3] classified problem occurrence into three categories, presented in Table 2: occurrence type, exploration type, and establishment type.

Based on Takasugi’s results, this study investigates the occurrence causes and solution methods according to the problem type. In addition, different problem types (shown in Table 3) were determined, and hundreds of problems collected. First, a cognitive task analysis of these problems was conducted to identify the attributes of each. Next, through iterative sorting based on their characteristics, 11 different types of problems were distinguished. The typology of problems in Table 3 represents a continuum, from left to right, of well-structured to ill-structured problems [4], and assumes that not only

TABLE 2. Problem occurrence type

Problem Type	Definition	Occurrence Cause
Occurrence type	Current status cannot achieve the desired target	Standard detachment and shortfall
Exploration type	Identifying current problems to appropriately change to a new standard	Improvement and reinforcement
Establishment type	Establishing a new standard based on the current status	Development, risk evasion

(Source: Takasugi, 2006 [3])

are there similarities in the cognitive processes required to solve each type of problem but also some instructional strategies can be generalized across them.

In addition, considering the attributes of social problems presented by D’Zurilla [6], Chang et al. [7], and Kim et al. [8], and the problem occurrence types presented in Table 2, this study investigates a solution-exploration process for solving social problems. Further, the problem solution types and solution methods were clarified, as presented in Table 4.

In addition, Leclerc and Moldoveanu [9] insisted that to solve complicated problems whose solutions are difficult to identify, those problems should be shaped in such a way that they can be easily solved. Thus, they proposed a new approach, or method, utilizing the “flexon” methodology.

In other words, to solve problems, different approaches should be proposed depending on the problem type. Therefore, the solution method that considers the characteristics of social problems should be used in that particular case, not one for solving general types of problems.

**2.4. Analysis of previous research on social problem-solving approaches.** This study analyzes previous research on approaches to solving both social and strategic problems. Chang [10] defined a “problem” as the difference between a state that an individual or group wants and the actual state, and “problem solving” as a process that calibrates activities that aim to fulfill certain goals. In addition, Hwang [11] insisted that there is a need to identify the fundamental problem before seeking a method for solving it. Porter and Kramer [12], through his shared-value creation theory, suggested that the requirements of a society be confirmed, markets be established, and thus the whole pool of economic and social values be expanded. Furthermore, in their creative problem solution (CPS) study, Isaksen and Treffinger [13] presented models for solving a problem creatively, consisting of three elements: (1) understanding the problem, (2) generating ideas, and (3) planning actions. They also suggested that balance is required between the divergent thought that concentrates on ideas and the convergent thought that applies the divergent thought to the successful utilization of such models.

**3. A Methodology for Solving Social Problems Based on Previous, Relevant Research.** This study used earlier studies to conduct process research, as shown in Figure 2, to develop solution methods for social problems.

In addition, those studies that supported the phases shown in Figure 2 were analyzed and arranged as presented in Table 6.

This paper has made reference to the research of Takasugi [3] for conducting a study on the problem occurrence types and causes as the first phase in solving social problems. In particular, analysis was undertaken to determine whether solution methods should be sought according to the different attributes of social problems. In addition, some researchers such as Rosenhead and Mingers [14] and Kim and Chang [26] indicated that

TABLE 3. Descriptions of problem types

Problem Types	Learning Activity
Troubleshooting problems	Examine the system; run tests; evaluate the results; hypothesize and confirm the fault state using strategies (replacement, serial elimination, space splitting)
Diagnosis solution problems	Troubleshoot system faults; select and evaluate treatment options, and monitor; apply problem schemas
Strategic performance problems	Apply tactics to meet the strategy in real time; complex performance maintaining situational awareness
Case analysis problems	Solution identification; alternative actions; argue position
Design problems	Act on goals to produce artifact problem structuring and articulation
Dilemmas	Reconcile complex, non-predictive, and vexing decisions with no solution; perspectives irreconcilable
Problem Types	Inputs
Troubleshooting problems	Malfunctioning system with one or more faults
Diagnosis solution problems	Complex system with faults and numerous optional solutions
Strategic performance problems	Real-time complex performance with competing needs
Case analysis problems	Complex, leisure-time system with multiple ill-defined goals
Design problems	Vague goal statement with few constraints; requires structuring
Dilemmas	Situation with autonomous positions
Problem Types	Success Criteria
Troubleshooting problems	Fault(s) identification; efficiency of fault isolation
Diagnosis solution problems	Strategy used; effectiveness and efficiency of treatment; justification of the treatment selected
Strategic performance problems	Achieving the strategic objective
Case analysis problems	Multiple; unclear
Design problems	Multiple undefined criteria; no right or wrong, only better or worse
Dilemmas	Articulated preference with some justification
Problem Types	Abstractness
Troubleshooting problems	Problem-situated
Diagnosis solution problems	Problem-situated
Strategic performance problems	Contextually situated
Case analysis problems	Case-situated
Design problems	Problem-situated
Dilemmas	Issue-situated

(Source: Jonassen, 2000 [5])

TABLE 4. Problem solution types and solution methods

Problem Solution Type	Solution Method
Intuitive problem solving	A method for solving problems without giving conscious thought to measures and their relative evaluations
Planned problem solving	A method for solving problems according to a given guideline
Analytical problem solving	A method applicable to comprehensive measures with large differences

(Source: Takasugi, 2006 [3])

TABLE 5. Approaches (methods) to problem solving

Methodology	Solution Method
Network flexon	The method helps to deconstruct the situation into a series of linked prediction and optimization problems by presenting the relationships between the entities
Evolutionary flexon	The method randomly repeats the current situation to eliminate inappropriate measures case-by-case, and seek the optimal measure
Decision-agent flexon	The method assumes that each interested party (consumer, competitor, etc.) makes efforts to optimize their benefits, and analyzes when and how their individual strategies conflict with those of the others
System-dynamics flexon	The method controls the situation to seek a method for solving the problem
Information-processing flexon	The method analyzes how decision-makers process information and predict the result

(Source: Leclerc & Moldoveanu, 2013 [9])

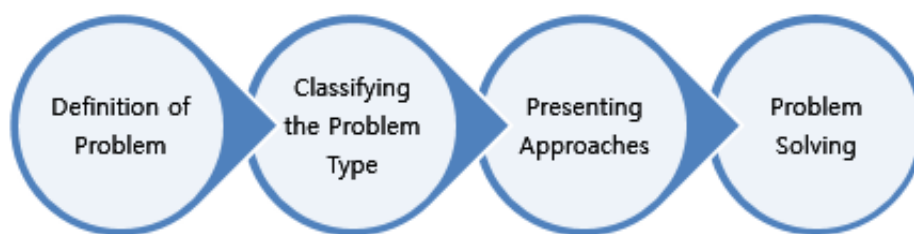


FIGURE 2. Process of solving social problems

to solve a problem logically, the tasks required should be drawn from that problem through its structuralization. Furthermore, Choi and Choi [27] and Park and Yeo [28] proposed that social problems should be defined in such a way, that is, considering their conditions and core characteristics, as to facilitate their solution.

In light of these earlier findings, it was therefore seen as necessary that the first stage of problem solving should be a process that allows the precise understanding of problems based on the given social phenomena. Chang [15] indicated in his study that a social service can become an effective means for solving social problems, while Song et al. [16] stated in his study that supporting scientific technologies is necessary to solve social problems caused by rapid social changes. Thus, it was considered very important to design

TABLE 6. Previous research on solving social problems, by phase

Research Phase	Detailed Study	Researcher
Defining and understating a problem	Investigating problem occurrence types and causes	Takasugi [3]
Classifying problems into problem types	Classifying social-problem types	Isaksen and Treffinger [13]
	Structuring real-world problems using problem types	Rosenhead and Mingers [14]
Presenting problem-solving approaches	Analyzing the solutions required for problem solving from previous research	Chang [15], Song et al. [16], Hwang et al. [17], Cho et al. [18]
	Analyzing the roles of the required technologies for problem solving from previous research	Kotler et al. [19], Lee et al. [20], Song et al. [16], Kim et al. [21], Cho et al. [18]
	Designing a value process that can comprehensively connect services and technologies for problem solving	Porter and Kramer [12], Chung [22]
	Developing frameworks to address problems based on social problems, desired services, and technologies	Song et al. [16], Isaksen and Treffinger [13]
Problem-solving methods	Developing a social-technology system	Song et al. [16], Geels [23]
	Developing service models to solve social problems	Chang [15], Hwang et al. [17], Mulgan et al. [24], Willis et al. [25]

a value process that can comprehensively connect services and technologies for problem solving. Song et al. [16] and Isaksen and Treffinger [13] studied idea collection methods to effectively draw out problem solutions, and Mulgan et al. [24] clarified the necessity to verify validity and reliability in solving social problems and use frameworks. In addition, Porter and Kramer [12], Chung [22], and Ko [29] discussed the development of frameworks for solving social problems, emphasizing the recognition of problems, conduct of investigations, and analyses of consumers in seeking improvements.

Furthermore, Geels [23] pointed out through his social-technology system theory that it is insufficient to introduce simple technological systems for solving social problems; further, he insisted on simultaneously constructing a “social-technology system” to extensively and continuously apply such technologies and thereby contribute to social-problem solving. Mulgan et al. [24] and Willis et al. [25] also suggested the development of proper service models to solve social problems. As such, to solve social problems, it is believed that detailed solution methods should be presented depending on those problems.

**4. Development of Methodology.** In this paper, a methodology for solving social problems based on the results of previous, relevant research is presented (Figure 3). The numbers used in this methodology, such as 1000, 1100, and 2000, indicate a step-by-step process.

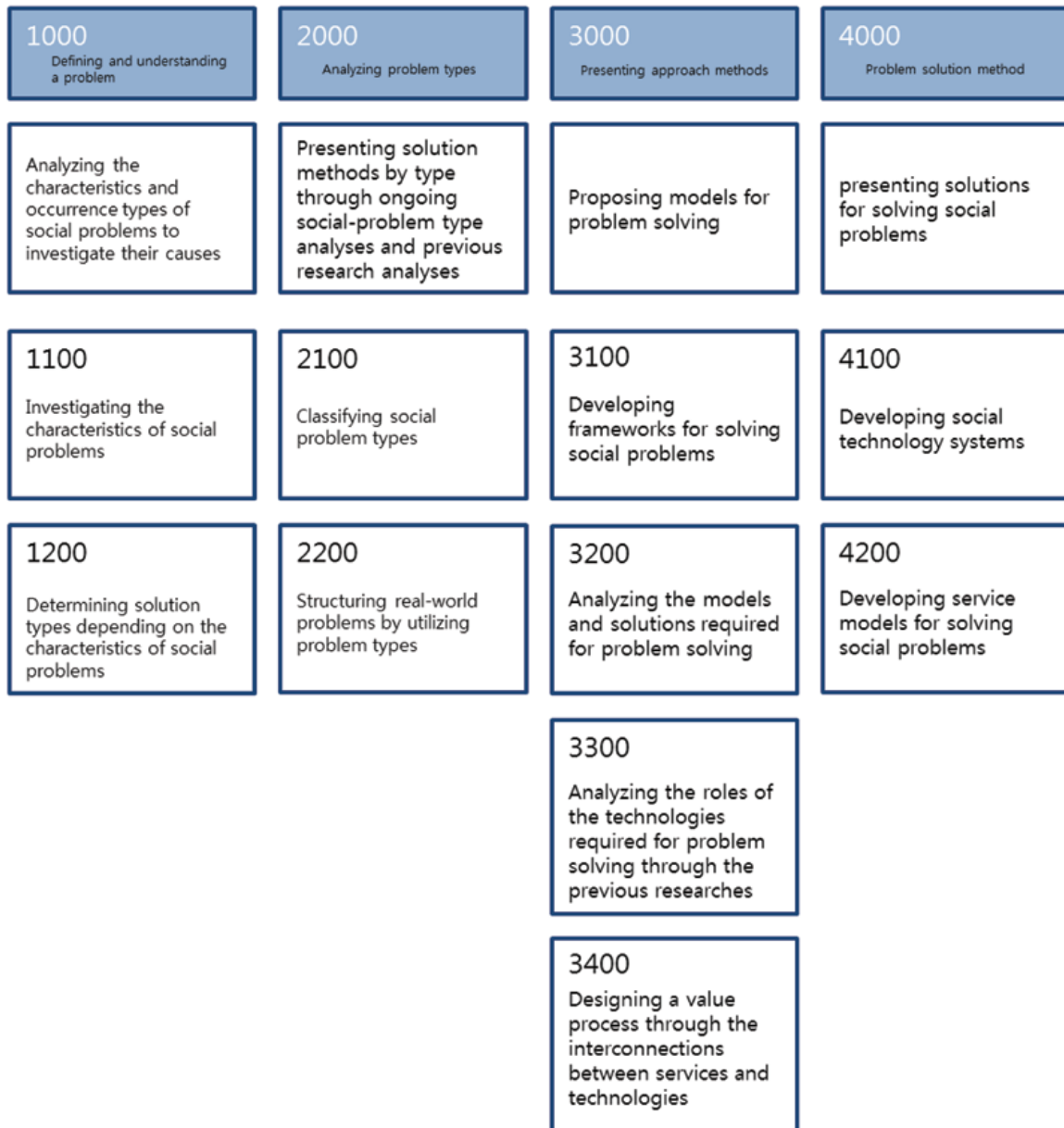


FIGURE 3. Development of a methodology for solving social problems

In the first phase, the characteristics and occurrence types of ongoing social problems are analyzed to investigate their causes, and solution types are selected for solving such problems.

During the second phase involving problem-type analysis, both the ongoing social problems and previous, relevant research are analyzed to investigate the solution methods by type. First, social problems are classified into type, from which structuralization plans are then proposed for their solution. Detailed models for these solutions are then presented. At this phase, frameworks for solving social problems are developed, through which the models and detailed solutions required to do so are analyzed. Further, the roles of the technologies required for problem solving are presented and analyzed, based on earlier research. Finally, a process of continuously interconnecting services and technologies for problem solving is designed, and detailed solutions are presented. Thus, a social-technology system and a comprehensive service model are presented.

## 5. Conclusions.

**5.1. Research results.** In this study, the necessity for a systematic research method led to the development of a method for solving social problems based on previous research into strategic solutions for such problems. Thus, earlier research findings were implemented to investigate social-problem types, the structuralization of problems, and solution methods by social-problem type. This is likely to encourage process studies and the development of social-technology systems to solve social problems, promote technological innovations, and balance competition-biased social environments through the enhancement of citizens' quality of life, including their welfare and safety.

**5.2. Expected effects and limitations of the research.** Many countries are currently making efforts to develop technologies for solving the ongoing problems in their societies, promote the quality of life for the socially deprived, as well as utilize existing technologies. The necessity of technologies and products for solving ongoing social problems and extending assistance to the socially deprived is recognized; as such, related technology development is currently under way. There still exist limitations, though, in developing such technologies and products as systematic models. In addition, to address such economic-feasibility problems, nationwide support is being provided and cooperation between large companies and social groups being built, but in practice, these efforts remain at the stage of collecting and utilizing individual ideas. Therefore, this study is considered to be significant in developing an evidence-based process and methodology to enable systematic studies for deducing solutions to social problems. Furthermore, the combination of social-problem types and desired services is expected to serve as an opportunity to develop new service and business systems. This study, however, is only the initial stage; a realistic reflection on the results of specialist interviews, etc., concerning the process and methodology is thus needed, although this can be supplemented through future studies, by phase.

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