



Innovation Management System Model of State Civil Services Using Soft System Methodology Approach

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ABSTRACT

The innovations in the public sector in Indonesia produced by the state civil apparatus have not been fully managed systematically and integrated. Several Ministries and Institutions, and Local Governments have made efforts to facilitate the innovation ecosystem even though there has been no connectivity and innovation platform integration. Problems that occur in the management of innovation in the public sector are different from those of the private sector, especially in the complexity of the problem, uncertainty, and the capacity of bureaucratic innovation. These problems require a different approach to studying them. One suitable approach for studying complex, uncertain, unstructured, and involving human social activities is the systems thinking approach, especially the Soft System Methodology (SSM). This study aims to formulate a conceptual model of the innovation management system produced by the state civil apparatus, especially civil servants in Indonesia, through the Soft System Methodology. The research results will be helpful for policymakers, especially agencies that have the task and function of encouraging innovation for the government sector (public sector) in Indonesia at both the central and local government levels.

Keyword:

public sector innovation,
conceptual model, system
thinking, soft systems
methodology

INTRODUCTION

The world has entered the 4.0 industrial revolution era where everything is going quickly, accurately, creatively, transparently, and efficiently. Indonesia is also one of the countries that must face various resources and strategies to equal

it to other countries, especially in innovation and competitiveness.

If innovation is necessary for the private sector, the same is true for the government sector. However, the problems faced by the government sector require a more complex approach for various

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reasons. The first problem is the long bureaucratic chain that often occurs even though corrective actions have been taken, especially when it comes to cross-sectoral or cross-ministerial/institutional/regional government affairs. According to Trilestari (2008), the next problem is the low capacity of government employees to innovate to solve increasingly complex public problems in a world that never breaks from the dynamics of rapid change. The third problem is the absence of a system that integrates the innovations produced by each entity in central and regional government elements. The State Civil Apparatus (ASN) spearheads every entity or work unit in the core provincial governments.

Initial facts show that there is not yet complete connectivity and integration between agencies in regulating, controlling, publishing, and facilitating innovation for the State Civil Apparatus (ASN), namely as follows. In the scope of public services, the Ministry of Apparatus Empowerment and Bureaucratic Reform (KemenPAN-RB) held a Public Service Innovation System (SINOVIK) competition for both central and local governments. Meanwhile, the State Administration Institute (LAN) takes this role by organizing the State Administration Innovation (INAGARA) Award in-state administration. Apart from the INAGARA Award, there are various kinds of innovations produced by ASNs made through multiple types of training or training, such as leadership training at multiple levels and even at the basic training level for prospective civil servants. Likewise, the innovation competition organized by the Ministry of Home Affairs (Kemendagri), namely the Innovative Government Award (IGA) for local governments in Indonesia.

These problems are a type of situation that involves human activities,

which are complex, non-linear, and difficult to solve by ordinary methods. One approach that provides alternative solutions to these problems is through a systems approach or system thinking, among others, through the soft systems methodology or SSM for short. SSM is a form of systems methodology that includes methods, tools, models, and techniques for implementing systems thinking (Barusman, 2017; Hardjosoekarto, 2012; Checkland & Scholes, 2005).

Several previous studies that discussed the concept of innovation and its application in the private sector and the public sector, both in the form of results from the training or an organization, have been carried out, including (Maulana, Aryaputri, & Rosyari, 2020; Sarika, 2019; Suparman & Lucita, 2018; Soesanto, 2017; Budiati, 2016; Ojasalo & Tahtinen, 2016; Haryono, 2012; Kardoyo & Dolant, 2009; Mulyono, 2008). However, no one has yet discussed integrating all the ASN innovations that work across agencies/sectors in an integrated management system using Soft System Methodology (SSM). More creative ideas and innovations will further increase the chances of real innovation success, as is the innovation funnel/filter concept (Schilling, 2015). The research to be carried out has not been found that has been researched or published based on search results on an online library search engine so far, so it is necessary to do so.

This study aims to formulate a conceptual model for the innovation management system produced by the state civil servants (ASN), especially civil servants (PNS) in Indonesia, through a systems approach, namely soft system methodology. The research results will be helpful for policymakers, especially agencies that have the task and function of encouraging innovation for the government sector (public sector) in

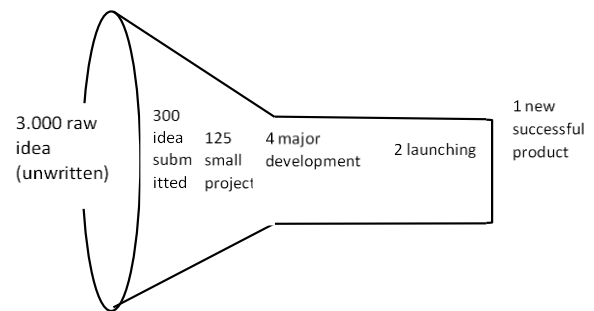
Indonesia at both the central and local government levels. In a more specific scope, this research's practical benefit is that the conceptual model of the ASN's innovation management system in the LAN and Training Ministries/Institutions/Regions will provide convenience and accuracy about the innovation data and information generated by ASN at various cross-organizations. The continuation of this research results will be beneficial for LAN and ASN Training Institutions, namely having a common platform through an integrated innovation system where the source of innovation comes from ASN in the organization, especially creation from the results of training. The impact is that public access to data and information on the produced innovations will be easier, faster, and more accurate.

Innovation is today often the most critical driver of competition in many organizations. In the private sector, many companies get more of their sales and profits from the products developed. Meanwhile, in the public sector, which is the government's domain, innovation is now an obligation for its apparatus in the context of managing programs and activities to improve better public services. Even for local governments, regional innovation is regulated explicitly in Law Number 23 of 2014 concerning Regional Government, and Government Regulation Number 38 of 2017 concerning Regional Innovation, where the definition of innovation is as follows: "All forms of reform in the implementation of regional government affairs and to improve the performance of regional governance. "

Innovation in the public or government sector is not too different from the private sector. The public sector also needs the economic benefits of innovation to develop itself as in the private sector unless it also concerns social problems (Mulyono, 2008). Most of the most

innovative ideas don't become successful new products. Many studies reveal that only one in several thousand pictures lead to unique product works. It takes about 3,000 raw views to produce a successful new product. Schilling (2015) describes this innovation process as a funnel, where many potential new product ideas enter a comprehensive end of the funnel. Still, very few make it through the development process, as illustrated in Figure 1. Further, according to Schilling, increasing the innovation success rate of an organization requires a well-developed strategy.

Figure 1. Innovation funnel / filter



Source: Schilling, 2015

Different types of innovation require further essential knowledge and impact competitors and customers (users). The four dimensions most commonly used to categorize innovations are as follows (Schilling, 2015): (1) product versus process innovation, (2) radical versus incremental innovation, (3) innovation increases competency versus competence, and (4) architectural innovation versus components.

Based on the innovation funnel concept, if the innovations produced by Indonesian ASN that may have a large number of innovations will be beneficial for stakeholders to obtain sustainable innovation. LAN and BPSDM K / L / D have one of the duties and functions, namely implementing leadership training, whose primary output is innovation. This view is relevant, as conveyed by (Dwiyanto 2016). If in one year around 15 thousand

people take part in the training of change leaders at various levels from Leadership Training Level I, II, III, and IV, how many innovations are produced by leadership training participants? Suppose 20 percent of the change leaders training participants can create innovations in their respective fields of work. In that case, the effect created by the training on improving bureaucratic performance is very significant.

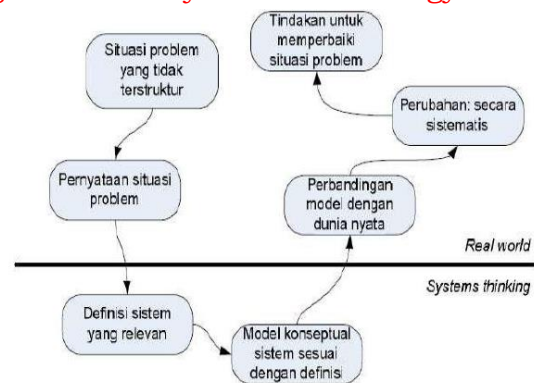
A system is a set of interrelated elements arranged coherently to achieve something (Meadows, 2008). Complex problems have many interacting components and are dynamic these days can be given alternative solutions through systems thinking. Systems thinking is a worldview paradigm that underlines a theory and methodology of a particular scientific subject. Systems Thinking is more likely to invite to think synthetically and holistically. Systems thinking is also a worldview and a process that can develop and understand a system and the approaches used to solve a problem (Barusman, 2017).

Barusman (2017) continued that the example of Systems Thinking in managerial implementation has an element of leadership or leadership. Leadership and Systems Thinking are closely related to one another. In this day and age, change occurs at any time and in any part of the world. So that all leaders will face the challenge of how to lead in a dynamic world. According to Waring (1996), the system methodology consists of a) Hard Systems, stating how to solve real-world problems that have been well defined. b) Soft Systems, learn how to better solve ill-defined and immeasurable real-world issues by focusing on human relations.

Soft Systems Methodology (SSM) is a form of systems methodology. The system methodology includes methods, tools, models, and techniques for

implementing systems thinking (Eriyatno, Nurhayati, & Pramudia, 2019; Hardjosoekarto, 2012; Barusman, 2017). The difference between SSM and other methodologies is the ability to abstract and raise problems related to the goals that the broader system will serve (Hitchins, 2007). According to Checkland & Scholes (2005), there are seven stages in SSM, presented in Figure 2, also called SSM Classic.

Figure 2. Soft System Methodology



Source: Checkland & Scholes, 2005

In Indonesia, innovation has become an everyday necessity for the State Civil Apparatus (ASN) at both the central and local government levels. Several previous studies that discuss innovation or those related to the SSM methodology are as follows:

Harimurti, Djunaedi, & Kumorotomo (2015) examined how the government's urgency of information (DIY Regional Government) is managed through an information management model through the SSM method. One of the exciting findings relevant to this research is that the effectiveness of information management in the DIY Regional Government can be fulfilled if there is a change in the mindset of digital government systems to become a connected government. These findings reinforce the formulation of this research problem that management models related to the digitalization of government services will be effective if they are interconnected between sectors, not just a digital tagline.

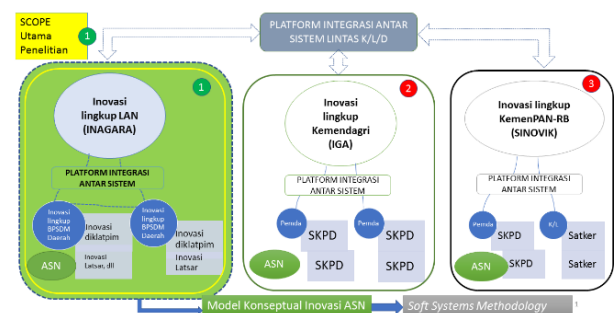
The problem of connectivity or networks has also been researched by Budiati (2016). He says that the strategic meaning of leadership education and training is to create bureaucratic leaders who have adaptive leadership competencies, which can encourage and mobilize other people in the organization and their organizations to constantly adapt to change by continuously innovating and collaborating from networks. Meanwhile, another aspect, namely the low capacity of government employees to innovate to solve increasingly complex public problems in a world that never breaks from the dynamics of rapid change, has been studied using systems thinking (Trilestari, 2008).

Innovation in the public or government sector is not much different from the meaning of innovation in the private sector because it cannot be denied that the public sector also needs the economic benefits of innovation to develop itself as in the private sector unless it also concerns social problems (Mulyono, 2008). The collaboration model to realize an increase in scale from government officials' innovations was researched by Soesanto (2017), namely innovations created by leadership training alumni (Diklatpim) that involve cross-sectoral actors, especially planning actors, researchers, leadership training alumni, and trainers. The finding is that integration and collaboration are needed to increase the scale of innovation from products produced by leadership training alumni in Indonesia so that the benefits are more significant. That result suits Sarika's argument that the government needs to present an innovation program that the public can easily access.

The framework for this research is illustrated in Figure 3. There are three innovation clusters in this research paradigm, namely LAN Innovation

(INAGARA), Ministry of Home Affairs Innovation (IGA), and KemenPAN-RB Innovation (SINOVIK), where each cluster stands alone. The main focus of this research is on cluster one, namely the management of ASN innovation in the LAN scope, which will examine using SSM to obtain a conceptual model of ASN innovation based on the ASN training output organized by the ASN training institute (BPSDM). Further, the innovation cluster within the Ministry of Home Affairs and KemenPAN-RB as information to show the position of this research in its full context.

Figure 3. Research Framework



METHODS

The approach used in this research is to use a systems approach, especially soft systems methodology. There are two types of systems approach; hard and soft systems thinking. Soft systems methodology (soft systems methodology) is included in qualitative research methods. In this study, Soft Systems Methodology (SSM) was selected. SSM is a systemic research process that, in its implementation, uses system models.

The research stages are carried by following 7 (seven) steps or procedures in the SSM method. (Checkland & Scholes, 2005; Hardjosoekarto, 2012; Barusman, 2017).

First, Assessing unstructured problems. At this stage, a number of the necessary information is collected regarding the ASN innovation system development strategy, including the

parties' views and assumptions through interviews, observations, and documentation. The scope of innovation to be observed is data and innovation information generated from ASN through government training institutions under the State Administration Agency's guidance, especially BPSDM DKI Jakarta Province. Second, expressing problem situations. The material obtained in the first stage is then used to build a rich picture (depiction of a real-world map) or a representation of the present state to capture the structure of the problem, the processes involved, and the relationship between structure and process.

Third, build a problem definition related to the problem situation. This section is to formulate the root definition, a short sentence that states, "a system does P in the Q way to achieve R." Analysis of root definition was carried out using the CATWOE analysis tool. This CATWOE tool is a reminder (mnemonic) tool so that the root definition created indeed describes a relevant human activity system that we choose. *C* or *Customers* are people who directly or almost immediately become victims or who will benefit from the transformation process in an organization. *A* or *Actors* refers to person or group of people who carry out activities in implementing the transformation process (*T*). *T* or *Transformation* is the process of converting inputs into outputs, both concrete and abstract. *W* or *Worldview* (*Weltanschauung*) the point of view, frame of mind, or image that makes the root definition or *T* has a meaningful meaning in the system implementation's context or impact. *O* or *Owners* are people or groups of people who have power over the system and have the authority to stop or change the transformation process of *T*. *E* or *Environmental Constraints* The environment becomes an obstacle for the *T* transformation process, including laws

and regulations, budgets, and other resources.

CATWOE analysis can enrich and refine the root definition, finalize, and construct a conceptual model of the relevant human activity system.

Fourth, Building a conceptual model. Based on the root definition above for each defined element, a conceptual model that built to achieve the ideal goal. The human activity system results from the expression of problem situations in a rich picture and the relationship between activities are identified and presented through this model. The main final output in the thinking system, according to SSM, is at this stage. This conceptual model is also known as PAM (Purposeful Activity Model).

Five, comparing conceptual models with problem situations. Conceptual models are compared with the natural world to highlight possible changes in the real world. Six, establish appropriate and desirable changes. The purpose of this stage is to identify and seek the desired changes, systemically and feasibly. Seven take corrective action for the problem. At this stage, recommendations for changes will appear to be implemented. SSM is a continuous learning process at the individual, organizational, and societal levels. The scope of this research is limited to only building a conceptual model or PAM (Purposeful Activity Model) due to limited budget, time, and conditions.

RESULT AND DISCUSSIONS

The following offers an explanation of the results and discussion of each of the stages analyzed, based on the steps produced through the SSM technique and the study's scope.

Introduction to Problem Situation

Problem situations related to innovations produced by ASN following the scope of this study are identified based on stakeholders involved and

associated problems. Innovation in the government bureaucracy is something that is currently being discussed in many activities. These innovations or breakthrough changes in the context of this research include innovations produced by ASN, especially ASN who sit in on structural positions, namely at the supervisory level, administrator, and high Pratama leaders. Apart from that, ASN candidates cannot be limited by their creativity and innovation even though they have just entered the bureaucratic world. The most available innovation space for ASN is through training. Training institutions organize these pieces of activity at both the central and local government levels.

DKI Jakarta Provincial Human Resources Development Agency (BPSDM) is one of the provincial level training institutions that conducts various kinds of training for ASN. In addition, BPSDM at the Ministry/ Institution/ Region is also a training institution according to their respective levels. Accreditation and training coaching for training institutions is carried out by the State Administration Institute, especially for managerial training and training for ASN candidates. The actual output in the form of documents from the training of ASN cadres called CPNS basic training (Latsar) is the actualization report on the fundamental values of ASN in which the CPNS makes innovations. Whereas at the level of managerial training consisting of supervisory leadership training (PKP), previously level IV leadership training, administrator leadership training (PKA) was formerly level III leadership training, level II national leadership training (PKN) once level II leadership training, and national leadership training. (PKN) level I was previously level I leadership training. All of these leadership training produce innovations following the scope of the level.

Dwiyanto (2016), in his book, stated that if in one year around 15 thousand people attended various levels of leadership training for change from Leadership Training Level I, II, III, and IV, how many innovations did leadership training participants bring? Suppose only 20 percent of leadership training participants can create innovations in their respective fields of work. In that case, the effect created by the training on improving the performance of the government bureaucracy is very significant. However, there are various kinds of problems that exist related to the innovation data.

Some of the main problems related to innovations produced by ASN through the training it participated in were successfully obtained from this research, namely:

The absence of a specific policy. Some of the principal regulations related to innovation include Law Number 23 of 2014 concerning Regional Government, Law Number 11 of 2019 concerning the National System of Science and Technology, PP Number 38 of 2017. While sectoral and cross-sectoral policies regulate the management of innovations made by ASN, the output of training does not yet exist.

A detailed digital database has not been compiled regarding the management of innovations produced by ASN. Databases that are structured, detailed, searchable, indexed, and accessible to the public have not been compiled digitally. The initial pilot allows the public to see the titles of ASN's invention, such as innovation from the output of training, can be accessible. For example, the invention from the output of leadership training and basic training at BPSDM DKI Jakarta Province has been published on the official website media with the tagline "Gerai Inovasi" with the

address: <https://www.bpsdm.jakarta.go.id/gerai-inovasi>.

Figure 4. "Innovation Outlet" at BPSDM DKI Jakarta Province



Government database management is essential, and one example is open government data (OGD). OGD policies can increase diffusion between government actors (Chatfield & Reddick, 2018). OGD can be used by business actors (Leviäkangas & Molarius, 2020).

Lack of human resources (HR) to manage the ASN innovation system. The innovations that have been produced from ASN, especially those that come from learning products in leadership training, basic training, and socio-cultural and functional technical training, have not been fully managed optimally. This condition is due to the limited human resources who manage or manage this matter. So that generally, after innovation is produced and the training ends, it is difficult to trace the sustainability status and the latest information from the innovation.

The lack of access to public participation. Innovations sourced from ASN are still limited in empowering public participation, partly because detailed access to innovation is not yet accessible to the public, whereas public involvement is essential. Accountability, transparency, and public participation are the spirit of the public service system (Hadi, Asworo, & Taqwa, 2020).

Lack of collaboration regarding the management of the ASN innovation system, such as the absence of network

connectivity between stakeholders who handle innovation from ASN in a digital system. Collaboration across stakeholders is believed to make an innovation better and more sustainable; however, after completing the training, in general, cross-stakeholder collaboration becomes challenging to trace digitally. Private participation in the management of ASN innovation has not been formally involved.

Collaboration is essential in implementing government programs (Rozikin, Hesty, & Sulikah, 2020). Collaborative stakeholders can include government, private sector, society, and new emerging technologies (Gascó, 2017).

f) The lack of maximum sustainability of the resulting innovations in the long term.

Table 1. Identification of Stakeholders and Their Roles in the ASN Innovation System

Stakeholder	Roles
State Administration Agency (LAN)	Regulation (the national policy of the ASN innovation system based on training outputs) and support the innovation ecosystem in the scope of training institutions
Training Organization (BPSDM)	Organizing the ASN innovation system, including the preparation of infrastructure, network connectivity, public accessibility, and human resource management
Regional Apparatus Organization (SKPD)	Support for the sustainability of innovation and collaboration systems
State Civil Apparatus (ASN)	Capacity and social capital to produce sustainable innovation
Private	Collaborative support for the ASN innovation system
Public	Collaborative support for the ASN innovation system

The sustainability of ASN innovations, especially those resulting from training outputs by training

institutions, is not optimal. However, there are many influencing factors, such as budget, position transfer, motivation, appreciation, and others. Until now, the status of the continuity of the innovations that have been held is not yet known.

Because of these various problems, the role of stakeholders is significant in encouraging the development of the ASN innovation management system. Therefore, it is necessary to identify the stakeholders involved and related to the ASN innovation system's problems, as shown in table 1.

Expression of Problem Situation

The complex problem situation regarding ASN innovation is depicted in a rich picture, as shown in Figure 5. The rich image displays perspectives on structures, processes, and relationships and reveals problems and values believed in symbolic visualization. Based on the rich picture built as shown in Figure 5, the map of problems related to the ASN innovation system can be understood. It starts from issues of policy, infrastructure, human resources (Schiuma & Lerro, 2008), governance (Andhika, 2018), collaboration (Rozikin et al., 2020), and sustainability of innovation. If the actions and support from stakeholders, especially LAN and ASN training institutions (BPSDM), are not managed properly, it will become a severe problem in the future.

Stakeholders in the rich picture include ASN, training institutions (BPSDM DKI Jakarta Province), LAN, SKPD, Private, and Public, which seem not all digitally connected. Following technological developments, private and public demands for public services have led to the importance of managing the ASN innovation system to keep pace with the current situation, primarily digital services. One form of collaborative innovation involving the public using digital technology is open innovation (Pedersen, 2020).

Relevant System Modeling (CATWOE)

Based on the introduction of the problem situation and the rich picture described earlier, how the ASN innovation system development process to be built is analyzed using the CATWOE table (Table 2). Customer, Actor, Transformation, Worldview, Owners, and Environment are described at that table.

ROOT DEFINITION:

The system carries out ASN innovation management activities based on training outputs (P) by implementing various programs and activities on multiple aspects effectively and on target with the involvement of multiple stakeholders (Q) to be able to improve the ASN innovation system sustainably in the framework of better public services (R).

Figure 5. Rich Picture of ASN Innovation Data Management Problem Situation

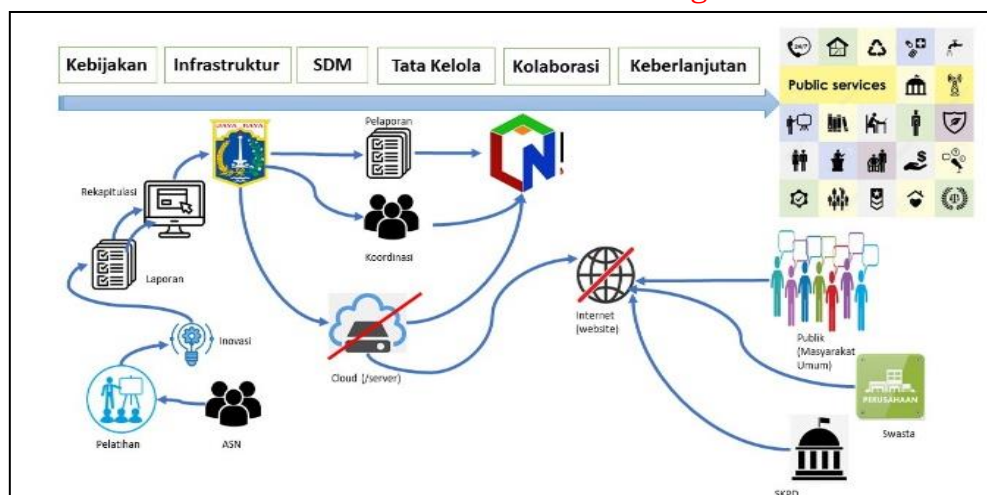


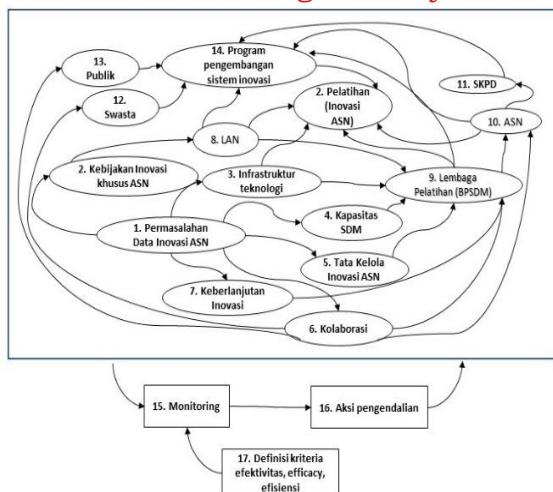
Table 2. CATWOE analysis

CAT- WOE	Definition
C	LAN, ASN Training Institute (BPSDM), SKPD, ASN, Private, Public.
A	LAN, BPSDM, ASN.
T	The development of an ASN innovation management system based on training outputs through various internal and external development strategies at training institutions in policy, infrastructure, human resources, governance, collaboration, and sustainability.
W	To construct an integrated ASN innovation management system among stakeholders, the LAN policy and the Training Institute (BPSDM) were established, and the development of good knowledge.
O	LAN, ASN Training Institute (BPSDM)
E	The national policy for the ASN innovation management system based on training outputs is still not a priority.

Conceptual Modeling

Based on the root definition, an overview of the conceptual model is compiled to identify the activities required to develop the ASN innovation system management. This conceptual model is an adaptive process, where the activities of the actors occur, and there is feedback between the process and the actors in the system (Figure 6).

Figure 6. Conceptual Model of ASN Innovation Management System



Sustainability of the ASN innovation management system, monitoring, and control action must be carried out properly using the criteria of effectiveness, efficacy, and efficiency. However, SSM is a learning process so that changes can occur in activities that occur between stakeholders.

CONCLUSION

Based on the SSM method, which is a system thinking process in this study, a conceptual model for the ASN innovation management system has been successfully formulated by creating a PAM (Purposeful Activity Model) structure. Some indications of problem aspects related to the management of innovations produced by ASN in training organized by training institutions (BPSDM DKI Jakarta Province) include ASN innovation management policies, digital technology infrastructure, human resource management capacity, governance, collaboration, and sustainability.

It is necessary to develop programs for innovation management systems that involve relevant stakeholders, as the findings of this study. There are several programs that at least address policy, infrastructure, human resources, governance, collaboration, and sustainability issues. In addition, it is also recommended to conduct further research to apply the results of this study using action research so that the implementation of the collective action of all stakeholders can be evaluated for its success.

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