THE DYNAMIC GOVERNANCE IN HANDLING THE EARTHQUAKE DISASTER

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ABSTRACT

Natural disasters often bring many victims due to the failure to implement dynamic governance. This study explains the contribution of management information systems, learning agility and collaboration factors. It creates able people and agile processes that ensure the creation of capabilities to develop adaptive policies as the implementation of dynamic governance in handling emergency response after the earthquake disaster in West Pasaman Regency from the end of February 2022 to early March 2022. The implementation of dynamic governance in practice is the speed in responding to the demands and needs of the community, which is supported by able people and agile processes so that it can run well; the researcher proposes the support of management information systems, learning agility and collaboration factors. This study uses a qualitative approach with a case study in Talamau District, West Pasaman Regency, as the location most severely affected. The study's results indicate that these factors need to be able to work correctly. It is marked by the handling of emergency response that has not been integrated and directed and seems slow, this can be seen from the delay and uneven distribution of aid, and there is still sectoral ego in decision-making and action. Therefore, the researcher recommended that local governments can develop these factors in the context of implementing dynamic governance. This study contributes ideas to the factors that can catalyze the implementation of dynamic governance, which has yet to be widely discussed in the literature.

Keywords: Management Information System, Learning Agility, Collaboration, Able People, Agile Processes.

1. INTRODUCTION

The earthquake disaster in West Pasaman Regency occurred on Friday, February 25, 2022, with a magnitude of 6.1 on the Richter scale and its aftershocks. It has caused many casualties in the form of lives and property. Based on data from the Regional Disaster Management Agency (BPBD) of West Pasaman Regency, losses and victims due to the disaster as reported by Antara online media (4/3/2022), the damaged facilities and infrastructure consisted of 4,381 housing units, 54 educational facilities, 13 health facilities, units, 40 units of worship facilities, 26 units of infrastructure, 17 units of government buildings. Meanwhile, 388 people died, consisting of 7 dead, 45 seriously injured, and 336 minor injuries[1].

Natural disasters such as earthquakes are unpredictable, but their consequences must be handled immediately so they do not cause a more significant impact. Therefore, local governments must respond quickly to these conditions following the principles of dynamic governance (DG)[2]. The principle of DG is producing adaptive decisions with the ability to think ahead, think again, and think across. While this capability can be created if there is a supportive culture and able people and agile processes to support this principle, the researcher proposes learning agility (LA), Management Information systems (MIS), and collaboration.

However, the earthquake that occurred could not be handled quickly, as reported by KOMPAS TV (3/3/2022, 12.30WIB)[3]. The delay in handling the earthquake disaster can be caused by confusion in data and information on victims and damage[4], coordination between policy implementers in the field, availability of resources consisting of human and financial resource capabilities, and information[5]. This fact shows that disaster management, especially during the emergency response from March 25 to April 10 2022, needs to be done in collaboration, the need for disaster MIS availability, and the need for human resources in implementing policies that can develop LA.

Many researchers have carried out research related to collaboration in disaster management. They are such as expanding the collaboration model into the

emergency management domain[6], challenges and strategies for multi-agency collaboration in disaster management[7], and cross-sectoral collaboration in building the resilience of the disaster management supply network[8]. They are also the main driver of cooperation in disaster management in the form of sectoral boundaries and homophiles [9]. This study has described the concept of collaboration in disaster management, which focuses on applying communication aspects during the disaster emergency response period.

Practitioners and experts have widely practised the LA concept according to the context of their respective scientific studies, including the LA concept in education. {Formatting Citation}, business organization management[12]–[19], but researchers still have not found the LA concept in the field of disaster management. The LA concept is fundamental in disaster management and other fields faced with VUCA (Volatility, Uncertainty, Complexity, Ambiguity) situations.

Disaster MIS during emergency response is necessary to overcome information confusion, where information systems strengthen emergency response operations quickly, precisely, and dynamically and can be decision support to facilitate emergency response operations[20]. Disaster MIS contains information management activity attributes and information characteristics[21]. In emergency management integrating all relevant multidisciplinary technologies, a comprehensive framework is proposed with database organization capabilities, integration, and decision-making tools[22]. Use of the Internet of Things[23], the role of data and information quality (DIQ) during disaster response decision-making [24].

The disaster mentioned above MIS concept has been proposing effective decision-making in its implementation. However, these concepts still have their respective limitations related to the range of data and information during the disaster emergency response period. MIS Disaster still provides one-way information in the form of dashboard data to support decision-making. There is no evaluation mechanism for data verification and validation to support effective decisions[20], and needs to explain MIS based on the stages of disaster emergency response[21]. The data obtained are still general [22],[23] and has yet to explain the mechanisms and procedures to obtain timely, accurate and complete data[24].

So that the MIS concept will be built in this study seeks to integrate the MIS concept above. This study is to answer the challenge of the need for timely, accurate and complete data. The research question the researcher poses is: What is the role of LA, MIS and collaboration in building able people and agile processes to create capabilities in realizing adaptive policies? To answer the research questions, the researcher explained these concepts one by one intending to apply them in the field to see the importance of these concepts in the implementation of DG in handling disaster emergency response.

2.   LITERATURE REVIEW

The concept of LA, SIM and collaboration that the researcher proposes as a catalyst for the implementation of the Directorate General in disaster emergency response, according to Figure 1, can be explained as follows.
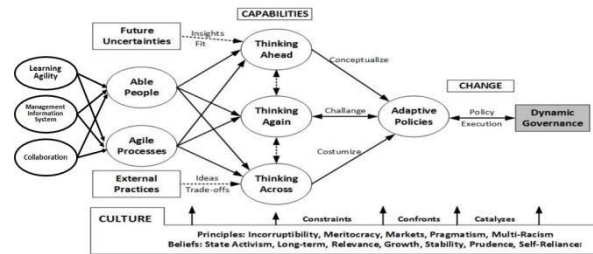

Figure 1. Concepts of LA, MIS and Collaboration in supporting able People and Agile Processes (adapted from Neo & Chen, 2007).

2.1.   Learning Agility (LA)

The LA concept was initially developed by measuring LA using an instrument called Choices Architect, which consists of four dimensions: people agility, change agility, result agility, and mental agility [25]. Furthermore, the LA concept was developed by adding the dimension of self-awareness[26]; then refining the LA concept with two main things, namely speed and flexibility[27]. So it comes to identifying two other factors that affect LA, namely skills and motivation[28].

The behavioural perspective in LA research explains that one cannot see the cognitive processes in learning. However, by outlining the behaviours associated with learning, one can better understand how individuals learn in organizations [29]. An inventory of 38 LA items by Burke and his team is named the "Burke Learning Agility Inventory" (Burke LAI), which is then grouped into nine independent dimensions[29].

The dimensions of the Burke LAI can be explained below.

- Flexibility: Be open to new ideas and propose new solutions.

- Speed: Acting on ideas quickly so those not working are discarded, and other possibilities are accelerated.

- Experimenting: Trying out new behaviours (i.e., approaches, ideas) to determine what is Effective.

- Performance Risk Taking: Seeking new activities (i.e., tasks, assignments, roles) that provide opportunities to be challenged.

- Interpersonal Risk Taking: Confronting differences with others in ways that lead to learning and change.

- Collaborating: Finding ways to work with others that generate unique learning opportunities.

- Information Gathering: Using various methods to remain current in one's expertise.

- Feedback seeking: Asking others for feedback on one's ideas and overall performance.

- Reflecting: Slowing down to evaluate one's performance to be more effective.

The Burke LAI instrument in this study is considered the most relevant, so in this study, the indicators used are according to Burke or Burke Learning Agility Inventory (Burke LAI). The Navy concept strongly supports realizing the DG principle in disaster emergencies. In response management, where the Navy can increase motivation, speed, flexibility, and skills, which can improve able people and agile processes in handling emergency response by personnel of the Disaster Emergency Response Task Force.

2.2. Management Information System (MIS)

MIS in disasters, usually called Disaster Management Information System (DMIS), has been proposed in various parts of the world for effective response to disasters. The DMIS definition includes a software package for networking, scheduling, and analysis. Indeed management of data resources during a disaster to enable expedited response and victim recovery [30], a computer database that facilitates multiple actors to share and use real-time information during an emergency response[20].

The DMIS developed in this study is based on the MIS. The concept involves collecting and integrating data from various actors for decision-making. It includes the flow and exchange of information among various stakeholders in effective and efficient response operations[20]. They implement a framework for dealing with emergency management, which involves the integration of various technologies[22] and using the Internet of Things to provide victim assistance and rescue[23]. DMIS has principal information characteristics: relevance, timeliness, accessibility, interoperability, reliability and verifiability. Also, the need for information management activities in the form of collecting, evaluating, process, sharing and saving [21]. As well as specific features of the data and information quality function to support natural decision-making processes during disaster response[24].

Thus, the MIS steps during the emergency response period are as follows :

1. *Assessment of the situation.*

   This is the first step to obtaining data and information on damage due to the impact of the disaster by visiting the site directly or utilizing data and information derived from available technology. The data and information obtained are helpful for possible actions in the emergency phase, such as rescue, medical services, and evacuation.

2. *Decision-making and establishment of Command Posts in determining Disaster Emergency Response.*

   At this stage, data and information analysis are carried out through Focus Group Discussion (FGD) with relevant stakeholders to discuss and decide on the status of disaster emergency response based on the data and information that has been collected. The results of this FGD also discussed preparing an operation plan, preparing the Disaster Emergency Response Task Force's command structure, and establishing a Command Post.

3. *Data collection.*

   At this stage, detailed data and information were collected and related to data from the field, such as the impact of damage, losses, and basic needs, such as data from donors and volunteers.

4. *Data inventory.*

   At this stage, an inventory of data is carried out by DMIS officers, consisting of data on disaster conditions, assistance data, volunteer data, data on aid providers, data requests for assistance, and so on.

5. *Data evaluation.*

   In the data evaluation stage, if it can have been collected and inventoried, then the data is evaluated to check the completeness and accuracy of the data with the relevant stakeholders.

6. *Synchronization and synergy of activities.*

   If the data and information have been obtained, then the data and information are used to synchronize and synergize activities.

7. *Evaluation of the implementation of disaster emergency response.*

   This evaluation stage by analyzing data and information related to the readiness of facilities in the field and the needs of the post-emergency response period so that victims can return to their places.

The steps in the MIS will be a reference in researching to emphasize the MIS concept and its implementation in the field. The use of DMIS in handling disaster emergency response can increase the able people and agile processes following the principles of the DG. Otherwise, the availability of fast, accurate and complete information data is beneficial for them in the cognitive process of carrying out their duties and tasks and making decisions.

2.3. Collaboration

Disaster management requires the togetherness and integration of all parties, both government and non-government, so it requires cooperation between stakeholders[31]. Some experts state the importance of communication in collaboration, such as[7], [32]–[35]. Three main variables in the collaboration process, like building trust, developing mutual understanding, and encouraging commitment, can be created through communication[36]. The concept of communication in collaboration has been discussed in the collaborative governance model that all collaborative governance is built on the face-to-face dialogue between stakeholders[37]. Collaboration in disaster management involves face-to-face dialogue, building trust and commitment, and determining achievable goals [38].

In this study, collaboration refers to the collaborative governance process: *face-to-face dialogue, trust building, commitment to the process, shared understanding, and Intermediate outcomes* [37]. The role of collaboration in handling disaster emergency response, the DG principle, can be realized by creating able people by sharing knowledge, experience, and understanding and creating an agile process due to smooth communication, trust and commitment among stakeholders.

3.   METHODS

This research was conducted with a qualitative approach with a case study method. The phenomenon studied is related to handling emergency response after the magnitude 6.1 earthquake (Friday, February 25, 2022) with a focus on the role of LA, MIS, and collaboration on able people and agile processes to improve decision-making abilities. Indeed, the implementation of situational recovery actions during emergency response. The study was conducted in Talamau District, West Pasaman Regency, especially in Nagari Kajai, as the location most severely affected by the disaster.

In-depth interviews carried out data collection in the field to obtain primary data. It was developed for handling disaster emergency response. Research informants were selected purposively to the stakeholders involved, as many as 30 people. The questions in the interview focused on the themes and research problems: (1) Have the personnel applied the LA concept in the implementation of disaster emergency response? (2) How is the management information system utilized during the disaster emergency response period? Moreover, (3) Has effective collaboration between stakeholders been established during the disaster emergency response period?

4.   RESULTS AND DISCUSSIONS

4.1. RESULTS

4.1.1. Application of LA concept in disaster emergency response.

The personnel involved in the emergency response have tried their best to carry out their duties as well as possible. However, in its implementation, there are still many obstacles due to the incompetence and lack of understanding of personnel in emergency response situations. At the same time, the direction from the authorities is still limited. This caused many delays in the distribution of aid and equipment and submitting activity reports and required data reports. This weakness can be seen from the limited ability of personnel to make quick decisions and the ability of management and administration to process data and information.

The ability of personnel to generate new ideas that mark the level of personnel flexibility and create breakthroughs as a form of personnel's ability to experiment still needs to be improved. The informant assessed that the most prominent personnel proposing new ideas and implementing them were from the Indonesian Red Cross (PMI). It is constructing temporary residential houses as stilts that could protect victims from weather and disease, making clean water facilities, and other valuable breakthroughs. While many other personnel still need to increase flexibility and experiment, they are still stuck with the routine tasks given by their superiors.

It is Performing risk-taking, interpersonal risk-taking and the efforts of emergency response personnel to collaborate. According to the informant, they are still weak; some personnel are allegedly unaware of their official responsibilities. Such as not attending meetings and even refusing assigned tasks. Besides that, many personnel do not want to take interpersonal risks because avoid conflicts that will make the situation worse, such as allowing uncoordinated delivery of aid through the Command Post, the absence of clear warnings in data and information management, and so on. Meanwhile, the ability to collaborate with emergency response personnel needs to be improved, which can be seen from the ability of personnel to work together in

integrating activities, so it seems that the implementation of activities needs to be directed.

According to informants, the weakness of information gathering, feedback seeking and reflecting the attitude of emergency personnel is primarily due to the lack of awareness in achieving maximum results for the progress of disaster emergency response management. They still expect guidance and direction to carry out their duties, but only a few have developed the independence to carry out their duties and can act quickly to achieve maximum results.

4.1.2. Utilization of Management Information System (MIS) for disaster emergency response

The informant considered the situation assessment, decision-making, and the establishment of the Command Post in the context of determining the emergency response. It could be carried out immediately, but the problem encountered was the problem of personnel readiness in providing disaster administrative support. It was still experiencing delays, such as in preparing emergency response action plans and preparing emergency response plans—supporting data.

According to interviews with informants, data collection activities and data inventory are still experiencing many obstacles due to differences in perceptions between data collectors and data users. In addition, the readiness of the emergency response information system is not yet adequate to carry out an inventory of incoming data. They consist of data on disaster conditions, data on victims and refugees, data on volunteers, data on aid providers, and data on requests for assistance. Evaluation of data to obtain accurate and complete data still needs to be done. The recipient of the data is more accepting of incoming data and pays less attention to how accurate and complete the data is.

According to the informant, the synchronization and synergy of activities in emergency response were carried out daily during the emergency response period in a coordination meeting forum involving stakeholders. This meeting discussed the evaluation of the implementation of activities in the sector by submitting data and information from the field. It is the data, and information available at the emergency response post, in addition to directing the effectiveness and synergy of implementing activities in the field. According to the informant, this activity has not involved many relevant stakeholders, so data and information often need to be completed and accurate.

This emergency response evaluation is carried out to gather input from stakeholders regarding the implementation of the emergency response that has been implemented by presenting the latest data and information. Then a discussion was held regarding the end of the disaster emergency response period. According to the informant, the end of the disaster emergency response seemed rushed and did not anticipate the needs of the victims after the emergency response, such as the readiness of temporary shelter facilities.

4.1.3 Effectiveness of collaboration in disaster emergency response

Face-to-face dialogue is carried out to establish communication and accommodate aspirations or ideas from relevant stakeholders. This face-to-face dialogue in handling emergency response is carried out by the Disaster Emergency Response Task Force with relevant stakeholders through daily evaluation meetings at the district level to discuss what has been done and what plans for the future. According to the informant, this face-to-face dialogue has occurred at every level. However, as a follow-up to these face-to-face activities in the field, there are still obstacles, for example, communication in disseminating data and information.

The process of trust building is carried out such as evaluation meetings at the sub-district, sub-district and Nagari levels. In addition, meetings with the community in the field were also held. At these meetings, efforts were made to foster the confidence of each stakeholder that handling disaster emergency response is a shared responsibility and for the common good. Trust building, according to informants, is more related to the distribution of logistics and equipment; this needs to be done after following the occurrence of several acts of looting logistics and equipment at the Command Post and also looting roads to distribution points.

Commitment to process is a commitment or agreement to carry out a particular process to achieve the desired common goal. Commitment to sharing means that they depend on one another to solve problems and solutions, that this process is a common property, and is open to mutual benefit. The commitment to this process can be seen in the agreement between the district and Nagari. This commitment is, for example, related to the technical distribution of assistance given to victims and refugees, the establishment of emergency response posts in the field and the implementation of joint and integrated activities to make the activities successful. According to the informant, this committee is still constrained by the unequal distribution of aid and equipment.

It is hoped that there will be a shared understanding in handling disaster emergency response. The mission will be carried out as a shared responsibility, identify problems so that they have a common understanding, and identify the fundamental values that form the basis for the process—for

example, understanding related to the provision of assistance and the community's attitude toward receiving assistance.

An intermediate outcome of an ongoing process that is useful and of strategic value. This provisional result can be seen from the formation of the Disaster Emergency Response Task Force at the district and Nagari levels and the filling of its personnel, the existence of an action plan for handling the disaster emergency response, then the establishment of Command Posts in the Subdistrict and Command Posts in the field, as well as the distribution of logistical assistance and equipment.

4.2.   DISCUSSION

The application of the LA concept during the disaster emergency response period in the West Pasaman district has not run optimally due to the limited capacity of the available resources, so the principles of DG have yet to be appropriately implemented. Therefore, local governments need to improve the quality of human resources in a disaster. The use of DMIS during the disaster emergency response period in West Pasaman Regency has yet to, due to the lack of quality human resources support, lack of coordination, and the unavailability of a data and information platform in the form of an application to manage it. Meanwhile, it is hoped that the data and information from the application can connect disaster management entities during the emergency response period. Then the need for an integrated application for data collection of victims, refugees, and damage. Therefore, we propose applying population data integrated with geographic and housing data, as shown in Figure 2 below.

Figure 2. Population Data Design Integrated with Geographic and Housing Data.

Furthermore, during the earthquake emergency response period in West Pasaman Regency is weak. A collaboration between stakeholders should have been maximized. It was followed by ineffective communication and coordination between stakeholders. Also, it coupled with the lack of firmness in control and the ego of several stakeholders, making many activities less focused and integrated. . This can be seen especially in collecting data on victims and infrastructure as well as the

distribution of logistics and equipment. Therefore, to improve this collaboration, it is necessary to increase the role of leaders in directing each stage of the collaboration process with effective communication.

5.   CONCLUSION

Implementing the earthquake emergency response in West Pasaman Regency still seems slow. Because the implementation of LA by emergency response personnel is not optimal, the use of DMIS in handling disaster emergency response is not optimal too, and collaboration between stakeholders still needs to improve. The low implementation of these three aspects impacts able people and agile processes. Thus the DG principle cannot work, so to create an able people and agile process, which supports the application of the DG principle, local governments need to improve the application of the LA aspect, maximize the use of management information systems and maximize collaboration between stakeholders.

The theoretical implication of this research is the application of LA, MIS and collaboration aspects in supporting the application of DG principles, especially to create able people and agile processes. In addition, it is practically necessary to have an application that supports the application of SIM based on population data that synergizes with geographic data and is supported by housing documentation, so it is hoped that data on victims and refugees can be obtained immediately, although those who own the house do not live there. Likewise, for logistics and equipment management, an application that connects disaster management entities is needed so that data and information can be immediately accessed and accelerate the distribution of logistics and equipment.

As a further study, the findings of this study need to be tested and validated with different methods and places to get more convincing results about the concept of LA, MIS, and collaboration that support the DG principle. In addition, additional research lines are digital platforms related to population data that are integrated with geographic and housing data as well as a digital platform for Management Information Systems in handling disaster emergency responses that connect disaster management entities in collaboration with relevant stakeholders.

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