DATA GOVERNANCE MODEL FOR NATION-WIDE NON-PROFIT ORGANIZATION

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ABSTRACT

According to Connolly's (2017) research, the context of nonprofit organizations exhibits variations when compared to commercial organizations or businesses, as supported by Zhang's (2010) study. Hence, it is imperative for both theoretical and empirical studies to contribute towards enhancing our comprehension of the strategy, implementation, and utilization of information systems in the specific context of nonprofit organizations. The investigation of information systems within the context of non-profit organizations offers a promising avenue for advancing the field of information systems research. This study focuses on the development of an information systems framework using the soft systems methodology, which has already been established. One opportunity for the advancement of information systems in non-profit organizations lies in the establishment of a comprehensive framework that facilitates adoption and is accompanied by robust data governance. This framework enables the analysis of data and the generation of valuable insights, thereby contributing to the development of information systems in the non-profit sector. The choice of data governance was informed by Zhang's (2010) research, which demonstrated that non-profit organizations face significant obstacles in the form of privacy and data security concerns. Furthermore, it is apparent that the preservation of data privacy plays a crucial role in the acceptance and utilization of information systems within non-profit entities. This research aims to contribute to the resolution of the issue by establishing a governance framework for information systems that effectively communicates to users the absence of data privacy risks associated with the systems employed by organizations. The objective of this study is to create a data governance model that will fill the research gap mentioned earlier and make a valuable contribution to the field of information systems research. The formation of the data governance model will involve the integration of soft systems methodology and the DAMA framework. The outcome of this study will be a data governance model specifically designed for a nationwide non-profit organization that utilizes microservices as its cutting-edge technology.

Keywords: non-profit, data, governance, information systems, model

1. Introduction

In 2010, W. Zhang, O. Gutierrez, and K. Mathieson investigated these development challenges and published their findings in Communications Journal of the Association of Information Systems, the journal of the Information Systems Association. Information pertaining to international scope In this study, it was found that social or non-profit organizations are slow to implement information systems in their agencies, despite recognizing the importance of information to achieving their vision and mission. Privacy and data protection concerns pose the greatest challenges for nonprofit organizations. It is concluded in the research section that research on information systems for non-profit organizations will contribute to research on information systems in general (W. Zhang et al., 2010).

The context of nonprofit organizations is distinct from that of commercial organizations or enterprises, according to Connolly's 2017 study, which also cited Zhang's 2010 study. Consequently, it is essential that both theoretical and empirical research contribute to our comprehension of the strategy, application, and utilization of information systems in the context of nonprofit organizations. This research concludes that the study of non-profit organizations is a fascinating phenomenon that has the potential to generate exponentially more practical

contributions that are beneficial to society (Connolly & Connolly, 2017). In addition, we hypothesize that recent interest in the field of data analysis may inspire more information systems contributions to research on nonprofit organizations, thereby diversifying the research contributions made by information systems researchers.

On the basis of previous research, it would appear that information systems research in the field of non-profit organizations presents an opportunity to contribute to the field of information systems research. One of the opportunities that can aid in the development of information systems The objective of research in the field of information systems for non-profit organizations is to develop a framework for information systems that can be adopted and is equipped with data governance so that it can be analyzed and generate useful information. The selection of data governance was based on a 2010 study by Zhang, which revealed that privacy and data security concerns pose the greatest challenge for non-profit organizations. Furthermore, it is evident that the issue of data privacy is a significant factor in non-profit organizations' adoption of information systems. This research can contribute to addressing this issue by developing a governance framework for information systems that ensures users are aware that the system used by these organizations does not constitute a data privacy risk.

Data quality is a success factor for an organization, and producing good data requires good governance, according to Borris Otto's 2011 research on data governance, which also served as a reference for the creation of a data governance framework by Zorrila and Yebes. excellent at data. In compiling data governance, according to Otto, there are two essential aspects: the actors involved in data governance and the data areas; additionally, the access rights of actors in data areas must be determined(Otto, 2011; Yebenes & Zorrilla, 2019; Zorrilla & Yebenes, 2022). According to a 2019 study by Harrison et al., organizations must prioritize the use of data as a propelling force for organizational processes, both in terms of quality and quantity, including those related to data standards, data quality management, governance, and security. In this study, it was also explained that a structured information system framework would facilitate a more effective data-driven procedure. These include enhanced data reporting, the elimination of data redundancy, the production of more accurate and timely information, the facilitation of data sharing between service-providing entities, and the enhancement of decision-making. Several crucial aspects of data governance are highlighted in this study, including data exchange, interoperability and modularity, and data quality. Data exchange describes how the process of exchanging data between two entities that are related either locally or at a higher level, interoperability, and modularity will change from a centralized system to a distributed, modular, and reusable system, whereas data quality describes the focus for review at a certain time on data quality and data quality monitoring (Harrison et al., 2019). Furthermore, Data considered as an organizational asset make its management and utilization more optimal. Data is not only stored in a database or archive space but continues to be processed and managed continuously to be utilized as useful information as an organizational policy(Aisyah & Ruldeviyani, 2019).

In addition, Harrsion explains that data exchange is technically feasible and can be executed, but it is not simple in terms of governance and that data quality requires special attention (Harrison et al., 2019). In a 2020 study conducted by Van Donge, it was determined that, in order to implement data-based electronic governance, several requirements must be met, including the formalization of data policies, the formulation of explicit data sharing policies, and the establishment of an external data access mechanism. Using the Application Programming Interface (API), for instance, to enhance data quality and encourage the use of data with clearly defined boundaries (Van Donge et al., 2020). On the basis of this previous research, trustworthy data governance is required. DAMA-DMBOOK is a commonly used data governance system. According to research conducted in 2022, DAMA-DMBOK is the finest data management practice that an organization should implement. DAMA-DMBOK will provide guidelines for activities to be performed or considered in each data management discipline. The purpose of data governance is to organize and coordinate the operational aspects of data management (Karkošková, 2022).(Karkošková, 2022)

According to the research conducted by Karkoskova, data governance is a collection of processes, responsibilities, and instruments for managing data. Moreover, data governance facilitates an enterprise-wide perspective for administering data as an organizational asset. This

practice facilitates the efficient delivery of high-quality data, which improves regulatory reporting and ensures regulatory compliance. High-quality data increases operational efficiency, which in turn reduces costs and creates value for the organization (Karkošková, 2022).

It is evident from the previous study that research on data governance is essential for non-profit organizations. This research will establish a national model for the data governance of non-profit organizations, allowing the process of exchanging data and determining data access to take privacy concerns into account. In addition, the research questions for this study are:

RQ1: Which data management domains are necessary for the data governance model of a non-profit?

RQ2: How models of data governance are suited for non-profit organizations?

2. Literature Review
2.1 Soft Systems

Soft systems are phenomena with a substantial social, political, or human element. The object and methodology of investigation in this system remain unidentified. The examination of soft systems as learning systems is feasible for the observer, notwithstanding the presence of intricacy and opacity within them. The Soft Systems Methodology (SSM), developed by Checkland, is widely recognized and highly regarded as a prominent approach in the field of soft systems analysis. The Social Systems Methodology (SSM) is a methodology developed by Checkland in 2001, which aims to understand and analyze social realities. The theoretical framework of this approach is based on the phenomenology of Husserl (1983) and incorporates elements from hermeneutics, particularly Schleiermacher's (1974) emphasis on the importance of context. Therefore, as an approach, it centers on the examination of issues or phenomena that possess a substantial social, political, or human element. The researcher assumes the role of a participant in the observed activities, with particular emphasis placed on the examination of the transformative process as the central focus of the investigation.(Ramírez-Gutiérrez et al., 2021). Soft systems methodology (SSM) is an approach that is employed to tackle complex issues and develop strategies to improve challenging situations. The approach is predicated upon the utilization of systems thinking principles and acknowledges the diverse viewpoints held by the individuals and entities engaged in the process of change. The origins of Soft Systems Methodology (SSM) can be traced back to the 1970s, over half a century ago. In its early form, SSM consisted of a series of seven stages. These stages encompassed the identification of problematic situations, the articulation of these situations, the formulation of root definitions for relevant purposeful activity systems, the creation of conceptual models for these systems, the comparison of these models with real-world observations, the identification of changes that are both systematically desirable and culturally feasible, and finally, the implementation of actions to improve the identified problem situation. This progression of stages is visually represented in Figure 1. The original seven-stage model has been refined into a two-stream model that highlights the importance of incorporating both a logic-based analysis, which involves examining the tasks involved in the given situation, and a cultural analysis, which involves evaluating the social and political culture that influences the situation. The methodology underwent subsequent refinement, resulting in a four-step process that exhibited reduced prescriptiveness. The primary aim of the initial activity is to gain a comprehensive understanding of the problematic situation, encompassing its cultural and political dimensions. This entails acquiring knowledge and insight into the various aspects of the situation. In order to facilitate this, the methodology involves the development of a comprehensive visual representation of the situation that illustrates the interconnectedness among the relevant actors, structures, and processes. The second activity, which is to formulate purposeful activity models, involves the development of conceptual models that outline the potential structure of activities within the given situation. This is not intended to serve as an impeccable blueprint for implementation, but rather as a tool to facilitate the organization of discourse surrounding viable and desirable resolutions to the challenging circumstance. The primary aim of the third activity, titled "Engage in a debate utilizing the models," is to ascertain feasible and desirable modifications. In the fourth phase of the process, titled "Enacting measures to facilitate progress," the outcomes of the preceding three phases,

specifically the modifications determined, are evaluated and executed as deemed suitable. (Augustsson et al., 2020).
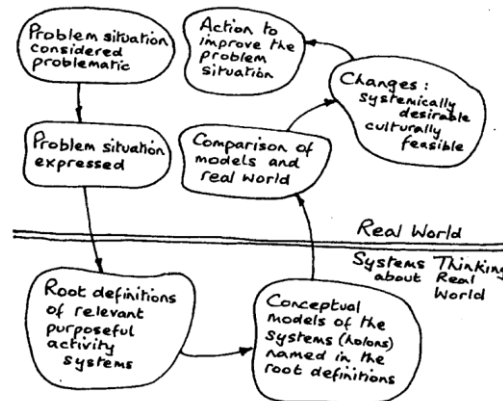

Fig. 1. Soft Systems Methodology (SSM) Step

Based on that definition Soft Systems Methodology (SSM) is one of the solutions to understand the stakeholder perspective regarding the requirements of data governance especially in the non-profit organization domain. This research applying SSM the to develop the data governance model for non-profit organizations.

2.2 Data Governance

Data governance is the exercise of authority and oversight over data management. Its objective is to implement an enterprise-wide data strategy, maximize the value of the organization's data assets, and manage the risks associated with data (Paramita et al., 2022). In this study, the organization under study is a non-profit that employs a decentralized governance system. According to Richard Heeks, this method has several advantages, including the ability to adopt local values for the system built and faster system development; however, implementing the method is challenging. This is how you should manage data that other systems might access or share. The difficulty posed by the decentralized e-government method is comparable to the problem of developing an information system for religious organizations, namely data privacy. This is consistent with what was described in a 2019 study by Yuting Lin and published by the Association for Computing Machinery (ACM). In this study, it was explained that in the practice of governing an electronic-based system, there are many challenges, such as protecting privacy and fostering mutual trust between entities. Weak, with a high data security risk, low efficiency, inconsistent data provision, challenging business process collaboration, poor data monitoring, and restricted information sharing. This necessitates immediate data governance solutions, particularly in terms of data sharing between applications. In this study, it is emphasized that data and information security encompasses not only authentic and accurate data but also the security of data transmission, processing, and exchange, as well as ensuring the data's authenticity, integrity, and accessibility (Lin, 2019).

Based on this, it is clear that the formation of data governance has a significant opportunity to strengthen the built-in information system model. Marta Zorrila and Juan Yebes conducted the most recent study on data governance in 2021. In this study, a data management framework for industry 4.0 was proposed, and the data governance framework was developed in accordance with the COBIT 19 information system governance framework. The research yielded a framework that seems appropriate for the 4.0 industrial era. According to the study, the data governance framework must include the six components listed below: 1) It satisfies stakeholder requirements and generates value from the use of data. 2) It is comprised of various parts that must function as a unit. 3) Because it is dynamic, whenever a change occurs, its effect on the system must be considered. 4) Distinguish clearly between data governance and data management structures and activities. 5) It must be tailored to the organization's requirements. 6) includes and considers all aspects of the organization (Zorrila, 2021). In 2011 research conducted by Borris Otto, which served as a reference for the development of a data governance framework by Zorrila and Yebes, it was stated that data quality is a success factor for an organization and that producing good data

requires effective data governance. In compiling data governance, according to Otto, there are two essential aspects: the actors involved in data governance and the data areas; additionally, the access rights of actors in data areas must be determined(Otto, 2011)

According to a different study by Harrison et al. published in 2019, businesses must prioritize using data as a driving force for organizational processes in both quality and quantity, including those pertaining to data standards, data quality management, governance, and security. In this study, it was also explained that an organized information system framework would encourage a better data-oriented process. These include enhanced data reporting, avoiding data redundancy, generating more accurate and timely information, facilitating data sharing between service-providing entities, and enhancing decision-making. In this research, there are several essential elements highlighted in data governance, namely data exchange, interoperability and modularity, and data quality. Data exchange talks about how the process of exchanging data between two entities that are related either locally or at a level above, interoperability, and modularity will change from a centralized system to a distributed, modular, and reusable system, while data quality talks about the focus for review at a certain time on data quality and monitoring of data quality. Furthermore, in this study, it was explained that data exchange is technically possible and can be carried out, but is not simple in terms of governance, and data quality is considered to need special attention(Harrison et al., 2019). In another study in 2020 conducted by Van Donge, it is evident that in carrying out data-based electronic governance, several aspects must be fulfilled, namely making policies on data formally, formulating policies on sharing data explicitly, and creating an external data access mechanism. for example, using the Application Programming Interface (API), attempting to improve data quality and stimulate the use of data with defined boundaries (Van Donge et al., 2020).

Based on this previous research, reliable data governance is required. One of the commonly used data governance tools is DAMA-DMBOOK. In 2022 research, it was explained that DAMA-DMBOK is the finest data management practice recommended to be implemented in an organization. DAMA-DMBOK will provide guidelines for activities to be undertaken or contemplated for each area of data management. Data governance lies at the center of the data management model and organizes and coordinates the operational aspects of data management . Karkoskova's research also emphasized the fact that data governance is a collection of procedures, duties, and tools for data management. Furthermore, data governance provides practice for a comprehensive enterprise perspective on managing data as an organizational asset. This practice facilitates the effective delivery of high-quality data that enhances regulatory reporting and ensures compliance with regulatory requirements. High-quality data increases operational efficiency, which, in turn, results in cost reduction and value creation for the organization (Karkošková, 2022). DMBOOK has 10 areas for data governance, namely data architecture, data modeling and design, data storage and operations, data security, data integration and interoperability, documents and content, references and master data, data warehousing and business intelligence, meta data, and quality data (DAMA International, 2014). The 10 areas of data governance from DMBOOK can be seen in Figure 2 below.
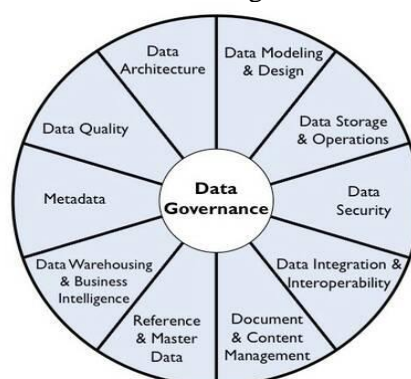

Fig. 2. DMBOOK 2 Data Governance Area

In this study, SSM will apply in order to identify the stakeholder specific requirements for data governance.

3. Research Methods

Seven SSM stages will be utilized in this study to develop a data governance model. Although SSM has been around for a very long time, many recent studies continue to employ it because it is ideally suited for analysis and problem-solving in complex and chaotic situations. In the fields of agricultural technology and nursing education, respectively, Raharja in 2020 and Zeleznik in 2017 conducted several recent studies that used SSM (Ramadhan et al., 2021). This study will use four of SSM's seven stages and then combine them by modeling data management in a more technical form. The combination and results of combining these methods will constitute a research contribution to this study. Furthermore, the SSM will also be supplemented with hermeneutics in order to interpret the text in the primary documents compiled for this study. Hermeneutics is typically employed in interpretive research, and it is also considered a "philosophy of meaning interpretation." Hermeneutics is initially concerned with "a method of interpreting textual data." In addition, hermeneutics can be used to comprehend an analogous text (such as an organization or a record created by authors). Originally, hermeneutics was used to interpret sacred texts and the law. Hermeneutics is closely associated with the reading process and "the art of comprehending all forms of communication, not just written text."(Ramadhan et al., 2012, 2021). In this research, the hermeneutics interpretation process will be conducted using MaxQDA and NVivo software. The steps of the interpretation process are:

1. Preparing primary data from interview process, organizational strategic and policy document, as well as open-ended survey result.
2. Performing open coding procedures.
3. Summarizing and linking the code using crosstab matrix as well as project map.

The research stages and results for each stage that apply the seven SSM procedures are detailed in Table 1 below.

Table 1 - Research Stages and Output.

Research Steps	Input	Process	Output
1. Problem situation.	Primary documents from interview results	Coding processing using MaxQDA and NVivo	Linking code that presents problem situation
2.Express problem situation.	List of code and the summary from coding process	Linking the code then express problem situation using Rich Picture Diagram	Rich Picture Diagram
3.Root cause analysis.	Rich Picture Diagram	Analyzing the root cause problem	CATWOE analysis table
4.Modelling conceptual diagram	CATWOE analysis table, Rich Picture Diagram	Modelling the activities to achieve the transformation rooted in the original definition	Conceptual diagram
5.Modelling Data Governance for Non Profit Organization	Conceptual Diagram	Modelling Data Governance Model for Nation-wide scale	Data Governance Model

4. Results and Discussions

4.1 Recognizing Problem Circumstances.

For the purpose of this study, primary data was gathered from a religious organization that holds a national affiliation, this process is to collect the primary and taking the opinion from the person who involved with organization directly (Gustriansyah et al., 2017). Primary data was collected through a combination of methods, including conducting interviews with 20 leaders of national congregations from various main islands in Indonesia, reviewing organizational policy documents, and administering an open-ended survey. The regions involved in the interviews conducted for this study are presented in Table 2. The analysis of all these primary documents is conducted using three hermeneutic procedures, specifically.:

1. The primary data for this study was obtained through a multi-faceted approach, incorporating interviews, analysis of organizational strategic and policy documents, and examination of open-ended survey responses.

   A total of twenty documents were carefully chosen from a variety of sources, including interviews, organizational strategic policy documents, and survey results. These documents

were then inputted into the MaxQDA application, which was utilized for the purpose of conducting hermeneutic analysis. Triangulation, a crucial element in qualitative research, will also be applied to these three categories of primary documents. Based on the tenets of qualitative research, Marshall et al. (2013) assert that a sample size of 20 is deemed adequate and is presumed to have achieved data saturation, as cited by Hennik et al. (Marshall et al., 2013)(Hennink & Kaiser, 2022)(Ramadhan et al., 2013).

2. Performing open coding procedures.

At this stage, the 22 primary documents undergo the coding procedure. The procedure of coding consisted of assigning codes to words, phrases, sentences, paragraphs, and images from the primary document.

3. Summarizing and linking the code using crosstab matrix as well as project map.

In MaxQDA, the parts that have been coded will become a code; for the next step, a theoretical code model will be created to determine the relationship between codes; and variables will be assigned to the informant profile, including the informant's educational background, the size of the organization he or she leads, and the informant's geographical location. Codes in MaxQDA will be exported to NVivo for analysis using the project map feature so that the relationship between informant variables and existing codes can be viewed. Figures 3 and 4 illustrate the Code Theory model and the results of the relationship between variables and codes in the form of a project map.

Table 2 - Informant Origins Summary

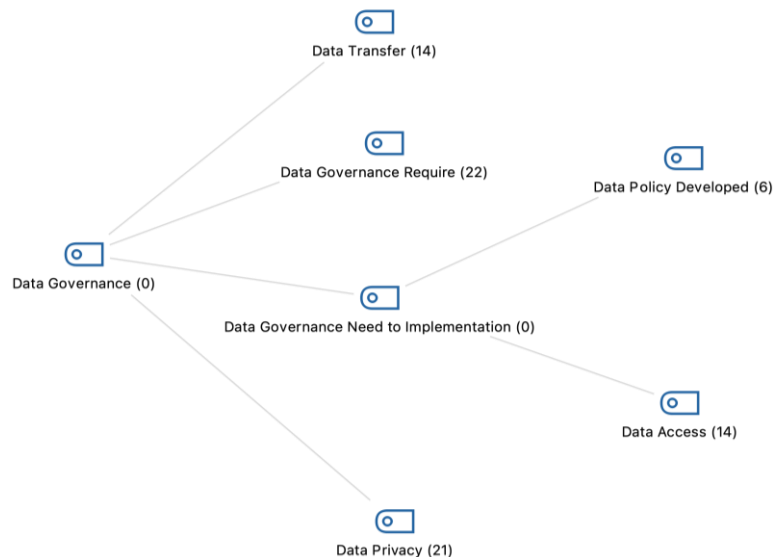| Geographical Location	Number of Informants
Java	8
Sumatera	4
Kalimantan	1
Papua	1
Sulawesi	3
Nusa Tenggara Timur	1
Maluku	1
Bali	1

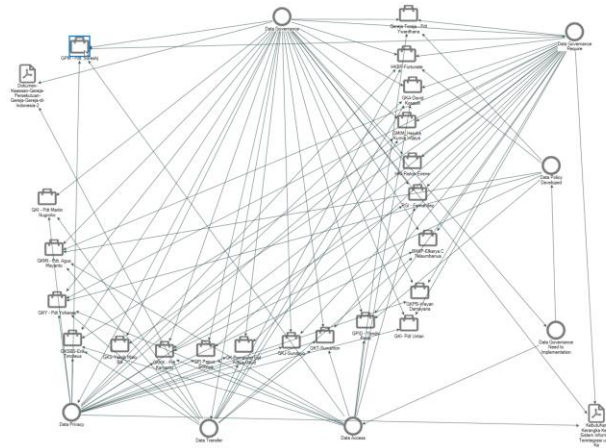Fig. 3. Code Theory Model From Coding process.

Fig. 4. Project Map from Derived Codes

Based on figure 3 as well as figure 4, can be seen that data governance is required to develop especially data transfer policy, data access policy and data privacy aspects. This clearly indicates that the answer to RQ1 is data security management, data integration, and interoperability.

4.2 Expressing Problem Circumstances.

It is the second phase of SSM. Based on the results presented in the preceding subsection, The Rich Picture Diagram generated as depicted in Figure 5.
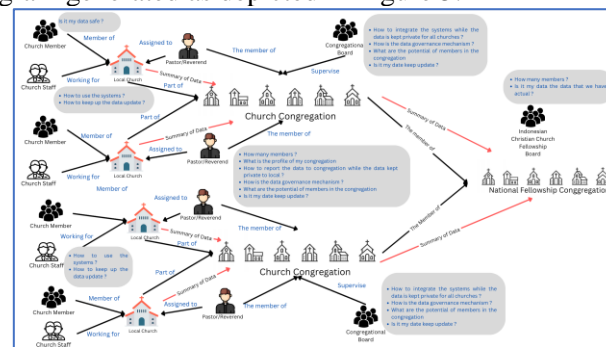

Fig. 5. Problem Situation Expressed in Rich Picture Diagram

It is evident from Figure 5 that the primary issue is data privacy and how to manage data so that it remains secure and privacy is maintained. This is to comply with regional and national data requirements, but data belongs to local organizations.

4.3 Root Causes Analysis.

CATWOE is conveyed in the form of a root definition as a formal statement of intent. On the basis of the CATWOE and its root definition, a human activity system (HAS) is devised to guide the execution of the transformation's specified output. Once the respective HASs for all transformations have been devised, they are implemented (Georgiou, 2015). To construct a model of the concept of a complex purposeful activity for use in an SSM-based study, a precise definition of the activity to be modeled is required. These definitional statements, the 'root definitions' of SSM, are based on an expression of a purposeful activity as a transformation process (Wheeler & Checkland, 2000). T. CATWOE is a tool developed by SSM for conducting root cause analysis. A mnemonic aid for remembering the following information regarding the human activity system (Augustsson et al., 2020):

1. Customers: the recipients or victims of the problematic situation and improvement intervention
2. Actors: individuals involved in the situation and executing the intervention for improvement.
3. Transformation is the process of change.
4. Worldview: Assumptions underlying the value and significance of the intervention for improvement

5. Owners: actors accountable for the development intervention and deciding whether or not it will be implemented.
6. Environmental constraints and enablers are contextual factors that may impact the problematic situation and the intervention for development.

CATWOE analysis summary presents in the table 3 below.

Table 3 - CATWOE Analysis.

CATWOE Elements	Description
C	National Church Fellowship, Congregations, Local Church
A	Board, Elder, Pastor, Secretary, Administration Staff
T	Member data can manage and traced easily and still private
W	Data governance can make the data tracking process run well while maintaining data privacy
O	National Church Fellowship, Congregations, Local Church
E	National government regulations, local government regulations.

4.4 Modelling Conceptual Diagram.

In this section, building a conceptual model is defined as "combining the activities required to describe the transforming process" or defining and connecting the activities required to achieve the transforming process (Ulrich & Reynolds, 2020). In this stage these root definitions are used to construct conceptual models. Conceptual models consist initially of seven or so activities, each with a significant verb, structured in a logical sequence and representing those minimum activities that are necessary to achieve the transformation enshrined in the root definition (Jackson, 2004). Based on rich picture diagram and CATWOE analysis the conceptual model for data governance model shown in figure 6.
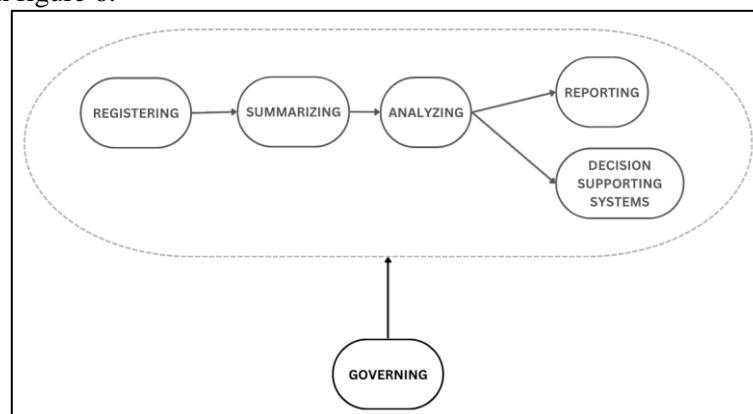

Fig. 6. Conceptual Model Diagram Propose.

The activity starts with data registration and then moves on to data summarization for further analysis, per the conceptual diagram in Figure 6. The outcomes of the analysis will be reported, along with considerations for local, regional, and national congregational decision-making. To protect data confidentiality, data governance principles will govern all these activities.

4.5 Modelling Data Governance Model.

All data-related processes must reside in the corridor of good and appropriate governance, as depicted in Figure 6. In this research, the area of data security and interoperability will be modeled. In the most recent studies in 2023. Data sharing between organizations is influenced by a number of driving and inhibiting factors, and achieving data sharing requires leveraging the drivers and overcoming the obstacles. Diverse authors use various terms, but the driving forces consist of the interests, motivations, and anticipated benefits of data sharing, while the inhibiting forces consist of the barriers and difficulties that data sharing poses. Depending on the circumstances, various contextual factors, such as legislation, organizational preparedness, political pressure, technical artifacts, etc., can play either a driving or inhibiting role (Susha et al., 2023).

Another research said data collaboration is the first essential aspect of data governance. Data collaboration is considered the foundation of data governance because it provides an environment for internal and external actors to collaborate on data standards or guidelines. (Q. Zhang et al., 2022). Data collaboration refers to an organizational structure in which corporations establish cross-departmental staff organizations internally and collaborative teams with external partners around data governance. Data collaboratives offer new opportunities, but they also present challenges and have demonstrated the difficulty of generating solutions for public issues (Ruijer, 2021). Based on the previous study, the security area of data governance should take an important place in data governance research. In this stage, the data governance model that accompanies data security management as well as data interoperability will be deployed and presented. Data is a delicate commodity. Data security must therefore safeguard and guarantee digital information against unauthorized access, larceny, and even corruption throughout an organization's processes and services. Data security management enables businesses and organizations to identify security hazards, implement appropriate security tools, and educate users on security compliance and awareness. The management of data security must assure confidentiality, credibility, and access privileges. Implement controls and procedures with multiple categories and activities, ranging from planning to operation and control, in minute detail (Febiryani et al., 2021). In the meantime, DAMA-DMBOK has addressed the process of data interchange in Data Integration and Interoperability (DII) issues pertaining to data sharing across applications and organizations. DII also refers to the procedures associated with the transfer and consolidation of data within and across data stores, applications, and organizations. Integration combines data into consistent physical or digital formats. Data interoperability is the capacity of multiple systems to communicate with one another. DII architecture can be accomplished via application-loose coupling techniques employing services, APIs, or message queues. Some articles on practical data management divide data governance responsibilities into three or four categories (Falahah & Santoso, 2022; Setyawan et al., 2022).

The data governance model can be seen in figures 7 to 9 below as well as table 4, which are based on the findings of prior research and a summary of the previously researched definitions as well as the answer of RQ2.

Table 4 - Summary of Data Governance Model Process

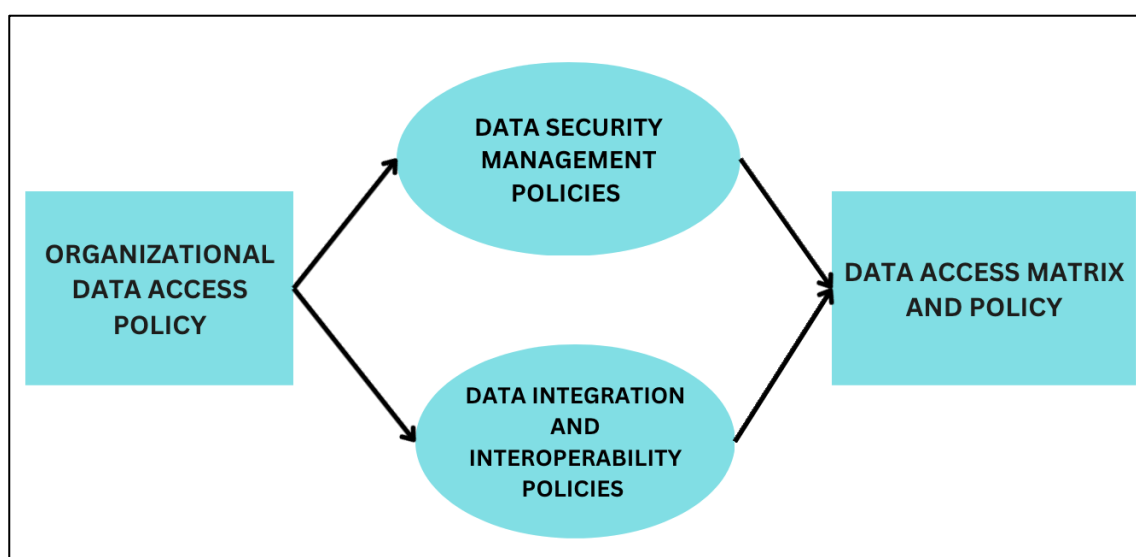| Input	Process	Output
Organizational policy and governance	Modelling the policy and governance into data governance aspects	1. Data Security Management Policy 2. Data Integration and Interoperability Policies

Fig. 7. Data Governance Model for Non-profit Organization

DATA POLICY MATRIX	DATA OWNER	DATA CUSTODIAN	DATA STEWARDS
ORGANIZATIONAL DATABASE	LOCAL AREA ORGANIZATION	LOCAL AREA STAFF	CONGREGATIONAL STAFF & BOARD
HUMAN RESOURCES DATABASE	REGIONAL CONGREGATIONAL AND NATIONAL CONGREGATIONAL	CONGREGATIONAL STAFF	CONGREGATIONAL BOARD / LOCAL AREA ORGANIZATION BOARD
ORGANIZATIONAL ASSETS DATABASE	LOCAL AREA ORGANIZATION	LOCAL AREA ORGANIZATION BOARD	CONGREGATIONAL STAFF & BOARD

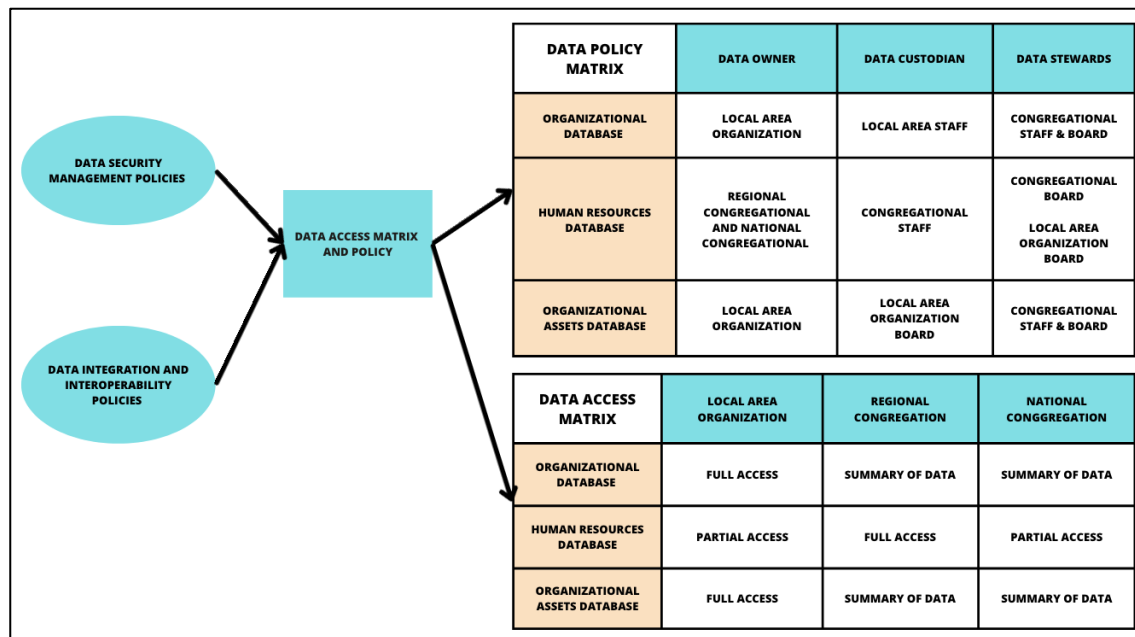| DATA ACCESS MATRIX	LOCAL AREA ORGANIZATION	REGIONAL CONGREGATION	NATIONAL CONGGREGATION
ORGANIZATIONAL DATABASE	FULL ACCESS	SUMMARY OF DATA	SUMMARY OF DATA
HUMAN RESOURCES DATABASE	PARTIAL ACCESS	FULL ACCESS	PARTIAL ACCESS
ORGANIZATIONAL ASSETS DATABASE	FULL ACCESS	SUMMARY OF DATA	SUMMARY OF DATA

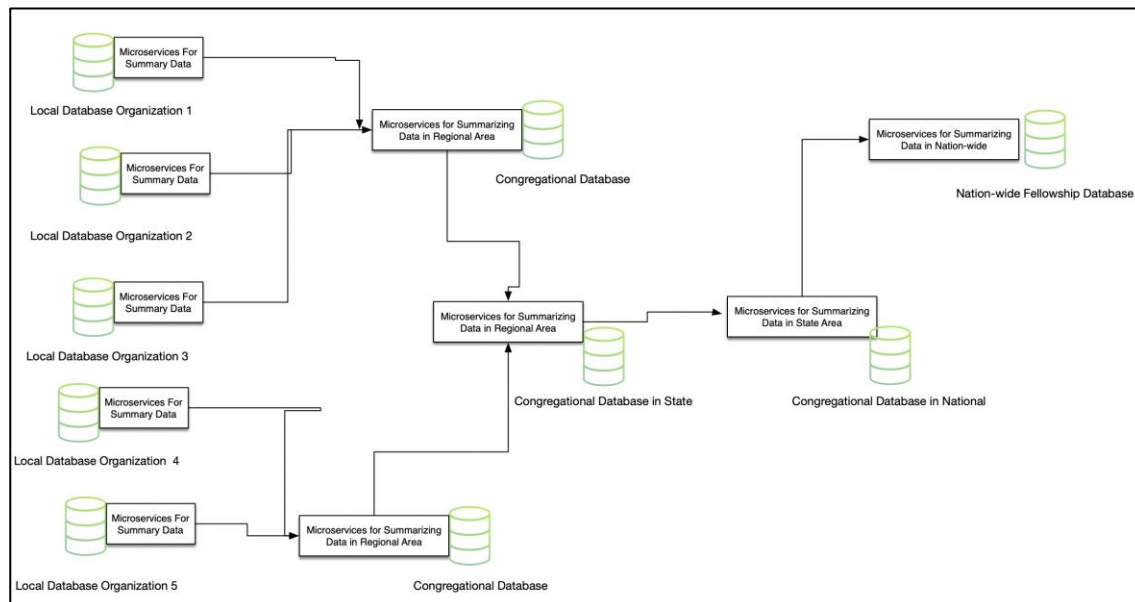Fig. 8. Data Governance Model Specification with Data Access Matrix and Policy

Fig. 9. Technology Infrastructure Design Diagram

As depicted in Figures 7 through 9, the data governance model will result in a data security policy model and a data integration and interoperability policy. A matrix for data access and policy data is constructed based on these two models. Figure 8 depicts the three categories of data administrators, namely data proprietors, data supervisors, and data custodians, according to the policy data matrix and data access matrix. The policy data matrix depicts the distribution of data ownership, i.e., who is responsible for each database within the organization, from the local to the national level, whereas the data access matrix maps access rights for each level of the organization to extant databases within the organization.

In this research, it is also recommended to leverage microservices technology in the process of data access and data exchange, where these microservices operate as intermediates between current information systems in businesses to supply the required data to other entities. Figure 9 depicts the proposed technological infrastructure for this study, where it can be seen that microservices are required for database access(Krämer et al., 2019). Furthermore, microservices can be characterized as an application service that exhibits strong encapsulation and loose coupling. It possesses a clearly defined scope and has the capability to be deployed independently,

operating in its own distinct process. Communication between microservices is facilitated through the use of lightweight technologies. The primary objective of microservices is to furnish businesses with enhanced availability and scalability.(Pinheiro et al., 2019). Based on previous research that has already identified microservices for the integration and storage of external data for each data source and domain, this study proposes an infrastructure for the integration and storage of external data. One illustration of a data source falling under domain 1 is A. An additional source of data may potentially be derived from the initial domain, albeit utilizing disparate concepts and employing a distinct technical lexicon. The term "company" can also be denoted by the synonymous terms "enterprise" and "organization." Furthermore, the allocation of microservices to specialized departments can enhance data governance, thereby reinforcing organizational responsibility.(Prof. Dr. Frederik Ahlemann Prof. Dr. Reinhard Schütte, 2021).

Discussion

This study selectively employs specific components of the DAMA data governance framework, focusing on the requirements of stakeholders, particularly non-profit organizations. Within the context of non-profit organizations, data management encompasses various challenges, with data security and data privacy emerging as the primary concerns. Consequently, this research focuses exclusively on strategies and measures associated with safeguarding data. Further investigation can be conducted to explore the potential adoption of other domains, such as meta data and document management, within organizational contexts. The non-profit organization has the capacity to provide assistance in the implementation of data security measures within the organization. Another area of research that pertains to data security is the examination of security measures within information system infrastructure. This research aims to persuade stakeholders within non-profit organizations to embrace information systems with greater transparency. Another idea for future research is in the technology adoption area, one of the alternative methodologies for technology adoption is unified theory of acceptance of technology 2 (UTAUT2). The UTAUT2 framework was developed as an extension of the UTAUT model in order to incorporate additional constructs that contribute to the understanding of technology acceptance in consumer usage. The objective of this study is to identify three significant constructs, incorporate revisions from the previous Unified Theory of Acceptance and Use of Technology (UTAUT), and investigate novel relationships due to the extensive adoption of new technology(Sunardi et al., 2022).

5. Conclusion

This study asserts that the establishment of robust data security measures, effective data integration strategies, and seamless interoperability are of paramount importance for non-profit organizations in the realm of data governance. Data governance can be represented through the creation of policies, security governance, and data access rights. These elements can be further translated into a matrix that outlines data access rights and data ownership policies, as illustrated in Figures 7 to 9

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