

Data Governance Design with the DAMA-DMBOK Framework (Case Study: PT. XYZ)

Agung Ismail¹, Arif Imam Suroso², Irman Hermadi³

^{1,2}School of Business and Management, ³School of Data Science, Mathematics, and Informatics
IPB University, Bogor, Indonesia.

Corresponding Author: Agung Ismail

DOI: <https://doi.org/10.52403/ijrr.20240823>

ABSTRACT

In the rapidly evolving digital era, the future sustainability of organizations depends on data and information as crucial elements in every aspect of operations, from understanding customers to developing products and setting strategic directions. PT XYZ, as a company engaged in trading goods/services, recognizes that data has very important value, and becomes a basic element and strategic asset in the decision-making process at the management level. This research aimed to obtain data governance design to the company's conditions by evaluating current data management, identifying data management needs, and formulating data governance design recommendations that align with PT XYZ's needs. This involves outlining the needs and conditions through internal policies, such as strategic plans, organizational structure, job descriptions, and established management procedures within the company. In addition, this approach also identifies data problems through maturity level measurements, analysis of measurement results, and gap analysis. By considering these aspects, the gaps that exist in data management within the company can be identified. It can help formulate a data governance design that meets the company's needs and business objectives based on the Data Management Body of Knowledge (DAMA DMBOK) guidelines.

Keywords: DAMA DMBOK, Data Design, Data Governance, Data Management, Maturity Levels.

INTRODUCTION

In the fast-growing digital age, the future viability of organizations depends on data and information as crucial elements in every aspect of operations, from understanding customers to developing products and setting strategic direction. For organizations, data and information are not only the "lifeblood of the information age", but also critical tools to get ahead of competitors. This awareness of the high stakes has led organizations to treat data and information as highly valuable strategic assets (Redman, 2008). Data is considered as a valuable asset that provides strategic and operational advantages, contributing to the development of an organization's business (Loshin, 2011). Despite the importance of data, few organizations actively manage data as a long-term valuable asset. Capitalizing on the value of data requires strong intent, planning, coordination, and commitment, as well as an active role from management and leadership (Dama International, 2017). ITGI (2003) describes the role of management and leadership in information technology (IT) governance. Data as part of Resource Management in IT governance becomes the responsibility of directors board and executive management, who ensure that the organization's IT supports and extends the organization's strategy and

goals. This governance is part of corporate governance, which consists of leadership, organizational structure and clear processes. Data quality should fulfill some criterias, such as completeness, uniqueness, timeliness, validity, accuracy, and consistency (International, 2017). The impact of poor data quality has been expressed in several references. Poor data quality can result in less effective decision-making and planning, business errors, and lost business opportunities (Sabtiana et al. 2019). Low data quality can lead to financial losses and difficulties in handling customer issues promptly and on time (Ortega et al. 2016). According to a Gartner survey, poor data quality has a significant negative impact on organizations, with average annual financial costs reached \$15 million in 2017. (Moore, 2018).

To achieve good quality data target, data governance design is required through a holistic approach that manages, protects, stores, and uses data efficiently and securely. A good data governance design can help organizations avoid risks such as data leaks, privacy breaches, and legal compliance issues. Effective data governance is essential because it can increase the value utilization of a company's data assets (Carratero et al. 2017; Otto, 2011) and reduce related data risks (Morabito, 2015). Therefore, challenges related to data accuracy and completeness need to be addressed by organizations (Kim and Cho, 2018). Korhonen et al. (2012) explained that high- data quality is the main source of business value, but data quality issues in organizations are often inadequately addressed, thus proper data governance is needed.

Khatri and Brown (2010) explained the importance of data governance for organizations that consider data as a valuable asset, which not only aims to ensure effective management and use of IT, but also to determine who is responsible for data-related decision-making. Governance involves determining who holds decision rights regarding to data quality standards,

while management involves implementing those decisions.

Managing data continues to be an urgently need for modern organizations. There are many opportunities for organic growth, cost reduction, and the creation of new products and services. However, these opportunities are not viable without effective data governance. The rapid growth of data and concerns about data privacy and security are increasingly burdening organizations. In addition, organizations will also face unforeseen consequences from new sources of risk. The solution to these challenges is a good data governance, which ensures a balance between risks and opportunities. In other words, data governance helps the organizations to manage and optimize the use of their data in a secure and controlled way, so they can take the opportunities advantage without increasing risks excessively (Ladley, 2019).

Data also has an important role in determining and influencing the success of a company's business, including for PT XYZ which was established on April 4, 2008. As a company engaged in trading goods/services, e-commerce, rental, and IT solutions. PT. XYZ has more than eleven years of experience in this field. Currently, the company has expanded its business to other business fields such as food and beverages, fashion, and others. Since its establishment, PT XYZ has collaborated with international IT brands and has served customers ranging from government agencies to corporations. As a company engaged in information technology, PT. XYZ always strives to develop itself through the latest technology and provide a friendly and efficient service system. PT. XYZ has branches almost around Indonesia with a range of services to customers in the provision of products and services from all lines of business models, both Business-to-Government (B2G), Business-to-Business (B2B), and Business-to-Customer (B2C).

PT XYZ realizes the importance of data management in supporting its vision and mission. Along with its business growth, the

volume of data owned by this company continues to grow. This data includes various important information, from operational data, financial data, to customer data. Therefore, effective and efficient data management is important to support fast and accurate decision-making, as well as to maintain data integrity and security. Because low data quality has a serious impact and results in lost business potential (Zellal dan Abdellah, 2016).

In general, PT XYZ has various categories of data that manage day-to-day operations to customer relationships. In the operational category, there is item inventory data that includes the amount of stock available, items that are on delivery, and items that have been sold. In addition, there is a delivery schedule that includes information regarding delivery time, delivery status, cost, and details of the responsible courier. In finance, PT XYZ manages sales transaction data that includes daily, weekly, and monthly transaction details, including sales amount, products sold, and payment methods used. Operational expenses such as employee salaries, utility costs, and marketing costs are also recorded in detail. The company's financial statements include balance sheets, income statements, cash flows, and statements of shareholders' equity. To manage customer relationships, PT XYZ collects customer profile data that includes name, address, contact, and product preferences. The purchase history stores customer products purchased data, the frequency of purchase, and the total purchase value. In addition, feedback and complaints from customers are also documented along with the actions taken to resolve the issues.

Panahy et al. (2014) highlighted the importance of maintaining a high level of data quality to improve business process efficiency. Poor data quality results in incorrect information, which can lead to failure in business process improvement efforts. Identifying data quality issues has a positive impact on the overall effectiveness and efficiency of process improvement

efforts. To improve data quality, it is often necessary to modify business processes by adding relevant improvement activities, which depend and change according to the data quality dimensions.

PT XYZ faces challenges in data management that include data problems, redundancy, and lack of structure or internal policies related to data governance. These conditions can result in a suboptimal decision-making process and potentially lead to the risk of errors in data processing. In addition, the inability to access and analyze data in a timely manner risks hindering the company from responding quickly to market changes and customer needs. To overcome these problems, an evaluation of the current data management at PT XYZ is needed, which aims to identify data management needs that can optimally support company operations.

Furthermore, based on the results of the evaluation and identification of these needs, it is necessary to formulate recommendations for designing data governance in accordance with company conditions. These recommendations are expected to provide concrete solutions to improve the data management system at PT XYZ, so the company has the capacity to fulfill company's current and future needs.

A data governance approach can help address data issues by developing repeatable standards and procedures, as well as improving effectiveness through coordination and transparent processes, in accordance with the principles of integrity, openness, and auditability (Koltay, 2016). By referring to the Data Management Body of Knowledge (DMBOK) Framework, organizations can design data governance that meets industry standards, including planning, coordination, and implementation focused on efficient and effective data management.

METHODS

The research was conducted at the PT XYZ Office located in Jakarta with three months of research period, from December 2023 to

February 2024. The sampling technique in this study is non-probability sampling with purposive sampling method addressed to informants who are considered experts or authorities in their fields (expert sampling). Respondents of this research are parties who are directly involved in the company from various departments or business units including warehouse and delivery, human resource and general affairs, marketing and communication, information technology, business-to-business, cooperation and intercity sales, business-to-government sales 1, business to government sales 2, solution, presales, accounting and tax commercial, finance accounting and tax customer, printing and supplies, product PC, peripheral acc and mobile, retail, dan business unit automatic identification and data capture.

Respondents are divided into two, namely the first respondent with a group of respondents reviewed based on their characteristics who are directly involved in policy-making, decision-making, and processing and using data from several departments (General Manager and Head of Business). Furthermore, the General Manager of Information Technology as the second respondent who is specifically reviewed based on the characteristics of knowledge, experience, and his position as one of the leaders is expected to be able to provide comprehensive information on the implementation of data governance in the company.

The types of data used in this research are primary data and secondary data. Primary data is obtained through a questionnaire arranged on a scale with six alternative answers, namely: value 0 (do not know), 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree). Secondary

data is obtained through in-depth literature searches and reviews as well as documents deemed relevant to the needs of this research such as the company profile of PT. XYZ, company operational data, and so the others.

Furthermore, data processing is carried out to evaluate the current state of governance to understand management expectations. Then the data governance design needs are identified by analyzing internal policies and identifying existing data problems. This process involves measuring data maturity, analyzing measurement results, and identifying gaps between current and expected conditions. Based on these findings, a data governance design was developed that included mapping roles and responsibilities, developing an operational model, and developing a proposed implementation roadmap that would guide the organization in achieving data governance goals.

RESULT

Data Governance Design Requirements

This approach aims to provide a comprehensive overview of the needs and conditions through internal policies, such as the strategic plan, organizational structure, job descriptions, and standard management procedures that have been established in the company. In addition, this approach also identifies data problems through maturity level measurement, measurement results analysis, and gap analysis. By considering these aspects holistically, the gaps that exist in current data management can be identified. This helps to formulate the right strategy to improve data governance, following the company's business needs and objectives.

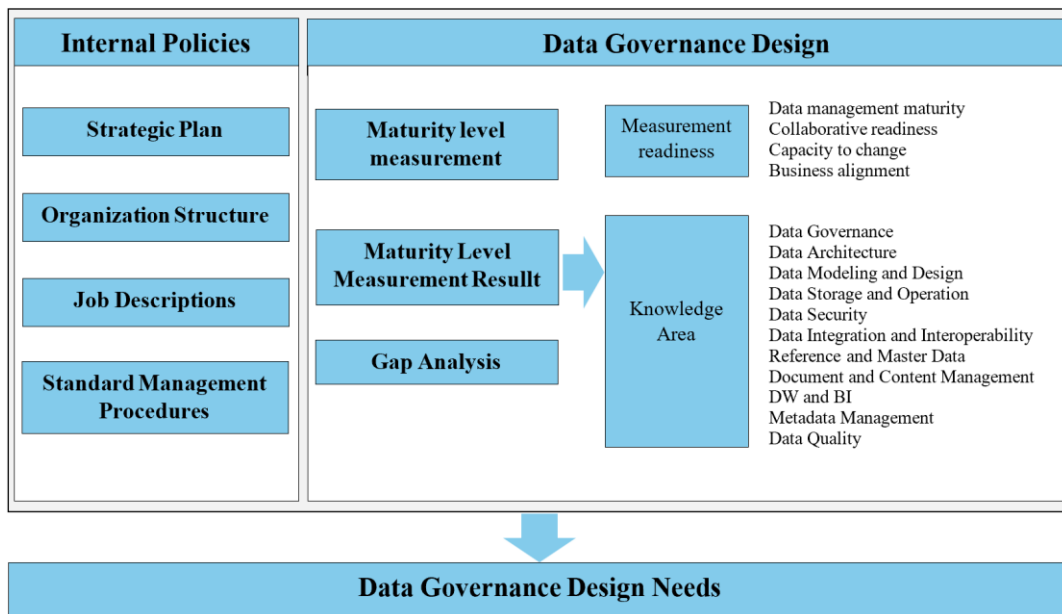


Figure 1. Design Requirements Analysis

Internal Policy Analysis

PT XYZ has designed its vision, mission, long-term goals, resource allocation, and organizational structure to improve operational efficiency and clarify the responsibilities of each unit and individual. Although job descriptions are in place, a specific policy for data governance to manage the roles and responsibilities is still missing. This raises concerns because data is an important asset for the business. Therefore, PT XYZ needs to immediately develop internal policies managing data governance to ensure good management, security, and compliance with regulations, so that data can optimize the added value to business operations.

Identification of Data Governance Issues

Maturity Level Measurement

According to DAMA International (2017), measurement is done to be able to describe the current state of an organization's information management capabilities, maturity, and effectiveness is very important in planning a data governance program. This assessment provides an understanding of the organization's starting position in terms of data management. By knowing this starting point, the organization can set realistic goals and arrange appropriate

strategies to achieve those goals. In addition, this assessment also serves as a tool to measure the effectiveness of the data governance program. By conducting regular assessments, organizations can monitor the progress and success of the program, as well as identify areas that require improvement. This helps in managing and maintaining the data governance program on an ongoing basis, ensuring that the program remains relevant and effective as the needs and conditions of the organization change. Measurements were made through two sections of respondents. The first respondent was given a questionnaire with categories:

1. Data Management Maturity, to measure the understanding of the point of view that business personnel have regarding the company's ability to manage and utilize data properly, as well as on objective criteria such as the use of tools, reporting levels, and others.
2. Capacity to Change, since data governance requires behavioral changes, it is important to measure the company's ability to change the behaviors required to adapt data governance.
3. Collaborative Readiness, data governance demands the company's ability to work together in the management and use of data. Since its

oversight crosses various functional areas, companies are required to have the ability to collaborate, therefore culture should not be a barrier to supervision.

4. Business Alignment, in some cases when assessing the capacity to change, the measurements of business alignment will be testing how well the company integrates the use of data with business strategy or how disorganized data-related activities are.

Table 1. Recapitulation of readiness measurement results

No	Category	Score
1	Data Management Maturity	2,1
2	Capacity to Change	3,2
3	Collaborative Readiness	2,5
4	Business Alignment	2,8
	Average	2,7

Based on the information above, four categories have been assessed. First, data management maturity scored 2.1 which indicates that the company has realized the importance of effective data management, and business personnel may have a basic understanding of the practice. However, the implementation and integration of these practices are uneven or not fully structured across departments. The use of tools for data management may have begun, but it has not been thorough or well-coordinated across all departments or business units. While the level of data-related reporting may be in place, it is not yet comprehensive or meets all expected objective criteria. Second, the capacity to change received the highest score of 3.2, indicating that the organization has a good capacity for change.

The company has taken steps to change behaviors required to adapt data governance. A strong understanding exists among business personnel regarding the importance of behavioral changes related to data management. However, these behavioral changes have not yet been fully integrated into the overall corporate culture, and there may be resistance in some departments. Third, Collaborative Readiness scored 2.5, indicating that the company has

realized the importance of being able to work together on data management and usage, as required by data governance. While business personnel have a basic understanding of the need to collaborate, the implementation of this collaboration is not yet evenly spread or thoroughly integrated across the organization. There is still resistance or cultural challenges in some parts of the department, which can hinder the implementation of collaborative data governance as a whole. Fourth, Business Alignment scored 2.8, indicating that the company has made efforts to assess the extent to which data usage supports or aligns with existing business strategies. Data-related activities may still be carried out sporadically or without a clear structure. This suggests that while there is an awareness of the importance of integrating data with business strategy, this implementation has not reached an even or well-structured level across departments.

With an average score of 2.7, it describes the current state of the company's information management capabilities, maturity, and effectiveness in planning a moderate data governance program. This score also reflects the extent to which the company has progressed in terms of data management and indicates which categories require improvement. This measurement is an asset in managing and developing a data governance program that can be used to measure the effectiveness of the program, monitor progress against set goals, and make necessary adjustments to ensure that the program remains relevant and effective. In other words, the acquisition of this score serves as a control and feedback tool that helps the company on its journey towards even greater data governance maturity.

Furthermore, the second respondent was given a questionnaire covering the following knowledge areas:

1. Data Governance,
2. Data Architecture,
3. Data Modeling and Design,
4. Data Storage and Operations,
5. Data Security,

- 6. Data Integration and Interoperability (DII),
- 7. Document and Content Management (DCM),
- 8. Reference and Master Data,
- 9. Data Warehousing and Business Intelligence (DW and BI),
- 10. Metadata Management,
- 11. Data Quality

Table 2. Recapitulation of knowledge area measurement results

No	Knowledge Area	Score	Level	Description
1	Data Governance	1,8	1	Initial/Ad Hoc
2	Data Architecture	2,33	2	Repeatable
3	Data Modelling and Design	2,00	2	Repeatable
4	Data Storage and Operations	3,00	3	Defined
5	Data Security	1,8	1	Initial/Ad Hoc
6	Data Integration and Interoperability	1,83	1	Initial/Ad Hoc
7	Document and Content Management	2,50	2	Repeatable
8	Reference and Master Data	1,8	1	Initial/Ad Hoc
9	DW and BI	0,00	0	No Capability
10	Metadata Management	0,00	0	No Capability
11	Data Quality	1,33	1	Initial/Ad Hoc

Based on the measurement results of all knowledge areas, it can be concluded that the current state of data management is at level 1 or initial/ad hoc, with an average value of 1.7. This indicates that the company is at an early stage in data management and still requires significant improvement in various aspects.

International (2017) defined six maturity levels, with each level having its characteristics that range from no capability and/or initial/ad hoc to optimized or optimization as follows:

1. Level 0 - No Capability: There are no formal practices or processes for data management in the organization.
2. Level 1 – Initial/Ad Hoc: Data management uses limited tools and no clear governance, relying on some experts. Each data owner works independently with inconsistent controls. Data solutions are limited, and data quality issues are widespread but not fixed. Infrastructure support focuses on the business unit level.
3. Level 2 - Repeatable: Organizations begin to use centralized tools and clearly define roles to support processes. Increased oversight and awareness of data quality occur, and the concepts of master data and reference data begin to be recognized.

4. Level 3 - Defined: At Level 3, data management capabilities begin to emerge with processes that can be scaled and institutionalized. Replicate data across the organization with controls in place, improving overall data quality. With a centralized design, policies can be managed in a coordinated manner, reducing manual intervention and more predictable process outcomes.

5. Level 4 - Managed: The knowledge gained from Levels 1-3 enables organizations to predict outcomes and manage data-related risks. At Level 4, data management includes performance metrics and the use of standardized tools from desktop to infrastructure, supported by centralized planning and governance functions. Improvements in measurable data quality and end-to-end data auditing capabilities become the characteristics of this level.

6. Level 5 - Optimization: When data management practices are optimized, the processes become highly predictable through automation and technology change management. The organization focuses on continuous improvement, with tools that provide comprehensive data visibility, control data duplication, and use clear metrics

to manage and evaluate data quality and processes.

Figure 2 illustrates the gaps that organizations are at an early stage in most areas of data management and shows that many gaps need to be closed to reach full maturity. To reach a higher level of maturity, organizations need to improve governance, quality, architecture, security, integration, metadata management, and various other aspects of data management.

A phased and systematic implementation of data governance is essential in enterprises due to the complexity of the initiative involving many aspects, from technology to people and processes. A phased approach

allows companies to focus on one area at a time, thereby reducing the risk of failure. In addition, big changes can create resistance within the organization. By implementing changes gradually, organizational members have time to adapt and accept the changes. This approach also provides an opportunity to learn from each stage and make some adjustments before moving on to the next stage. Thus, with a systematic and phased approach, companies can manage their resources better, and their time, money, or manpower. Overall, a phased and systematic approach helps to ensure that data governance initiatives are implemented effectively and sustainably.

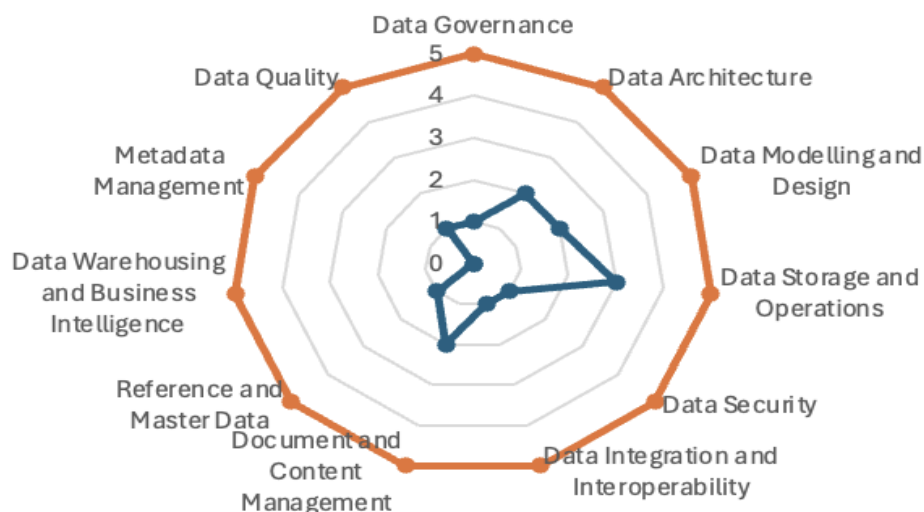


Figure 2. Gap analysis graph

DISCUSSION

Data Governance Design

Referring to the gap analysis in the scope of the case study that has been adjusted, the following are proposed recommendations for data governance at PT XYZ.

Role and Responsibility Mapping

Data governance at PT XYZ serves to assign responsibility for data by dividing the governance board based on function and authority. This board consists of directors, general managers, managers, and staff from each function, creating an organized and well-structured system. The director, as the highest leader, is responsible for

determining data strategy and policy and ensuring data is managed following organizational goals. General managers and managers implement these policies and strategies, ensuring that their staff understand and comply with the applicable standards. The staff of each section are responsible for the day-to-day management of data, ensuring that data is collected, stored, and used safely and efficiently. Therefore, data governance at PT XYZ ensures that every individual in the organization understands and obeys their responsibilities towards data, effectively supporting the organization's goals and missions.

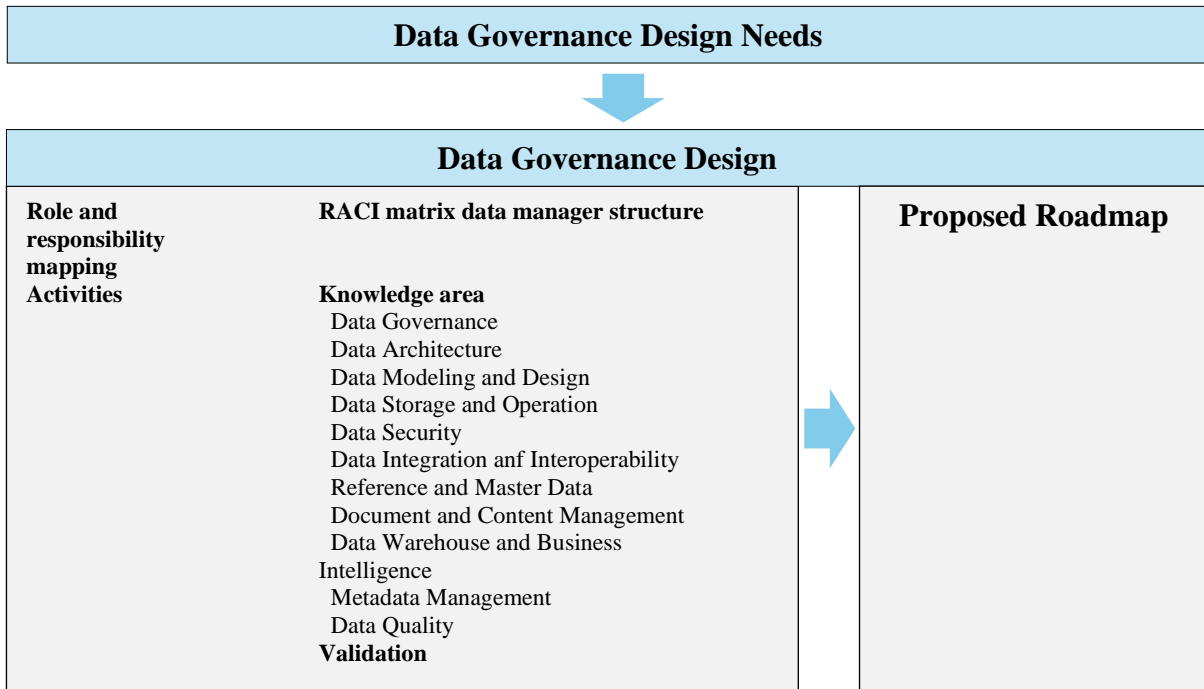


Figure 3. Data governance design

Table 3. Recommendation on roles and responsibilities

Roles	Positions	Description
DGSC	Director	Senior executive strategic decision maker
DGC	General Manager, Manager	Responsible for tactical decision-making
DGO	Manager, Staff Senior	Responsible for the coordination and execution of initiatives and has a good understanding of data and business processes
DST	Staff	Responsible for daily data management
DC	Staff IT	Individual or team responsible for data storage, maintenance, and protection

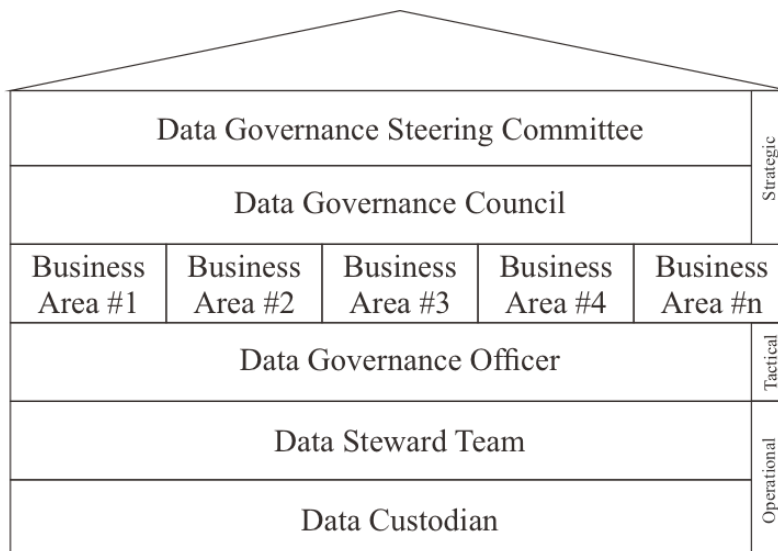


Figure 4. Recommendation of data manager structure

Activities Knowledge Area

Considering the company's condition and potential factors, the general recommendations for each knowledge area

are outlined based on the level of maturity achieved, expected to provide more flexible and relevant guidance to upgrade each knowledge area to a higher level in data governance.

At Level 0 (DW/BI and Metadata Management), the organization socializes the importance of DW/BI and Metadata Management to senior management and key stakeholders, to improve operational efficiency and support better decision-making, as well as improving data quality and reporting capabilities.

At Level 1 (Data Governance, Data Security, DII, Reference and Master Data, and Data Quality), basic steps are taken by creating policies that govern various aspects of data management. Data governance policies include standards, definitions, roles, responsibilities, approval processes, and data quality monitoring. Data security policies set standards for data classification, access control, encryption, and identity management. Data integration and interoperability are governed through data standards policies, consistent formats, and integration protocols. Reference and master data management, as well as data quality standards, are also formally regulated.

At Level 2 (data architecture, data modeling and design, and DCM), the development of a unified data architecture and unified data model was carried out to manage data structures and system integration across the organization, as well as develop data entities and relationships between data. A document and content management system (DMS) was adopted to support centralized document management, enabling indexing, searching, version control, and document collaboration.

At Level 3 (Data Storage and Operations), tools and technologies to automate data storage processes and operations were implemented, including the use of storage management software to manage backup workflows, data recovery, and automated monitoring of data storage performance.

Validation

Validation is done through interviews with parties involved in data governance to evaluate the suitability of the recommendations based on the company's current conditions. The company can start with the areas that have the highest validation score of 3, namely data governance, reference and master data, and data quality, as these are areas that can be implemented effectively with existing capacity. Next, focus on areas with a validation score of 2 with additional efforts to improve capabilities in data architecture, data modeling and design, data storage and operations, data security, data integration and interoperability, document and content management, and metadata management. In the end, the company can start preparing the initial steps for DW and BI as a long-term priority. Based on the validation results, the percentage value of the compatibility of the proposed recommendations can be determined using the following calculation.

$$\text{Compatibility} = (\sum \text{Score average}) / (\sum \text{Max score}) \times 100$$

The results of the validation calculation obtained a value of 73.9%. This result shows that the proposed recommendations above are still following the needs of the company.

Table 4. Recapitulation of recommendation validation proposal score

No	Knowledge Area	As-Is	To-Be	Validation
1	Data Governance	1	2	3
2	Data Architecture	2	3	2
3	Data Modelling and Design	2	3	2
4	Data Storage and Operations	3	4	2
5	Data Security	1	2	2
6	Data Integration and Interoperability	1	2	2
7	Document and Content Management	2	3	2

8	Reference and Master Data	1	2	3
9	DW and BI	0	1	1
10	Metadata Management	0	1	2
11	Data Quality	1	1	3

Roadmap Proposal

The proposed roadmap formulates a plan to develop data governance within the company over three years divided into six stages. The first stage focuses on the fundamentals of data governance, the second stage is on data structure development, the third stage is on data model and design, the fourth stage is on data

validation and standards implementation, the fifth stage on report development and data analysis, and the sixth stage on data governance completion. This approach provides step-by-step guidance to improve overall data governance, ensuring data is well-managed, accurate, and useful to the enterprise.

Table 5. Roadmap proposal

Data Aspect	3 Years					
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Knowledge		Data Architecture	Model and data design		Report and data analysis	
Quality	Data quality management implementation	Centralized data source	Data cleaning Identification	Validation	Monitoring	
Standard	Establish policies and standards	Socialization/ Dissemination	Data classification	Data governance training		
Governance	Defining data governance	Define strategy	Team formation	Implementation		Alignment

CONCLUSION

This research showed that data management at PT XYZ is currently at level 1 or early, it indicated that the company is still in the early development stage in terms of data governance.

Recommendations for mapping roles and responsibilities and a proposed roadmap can help direct the company to start data governance.

Implementation of the DAMA-DMBOK framework can be a possible solution for PT XYZ which still starts to build data governance in stages. The framework provides a solid foundation for more structured and organized data management.

Further research can focus on detailing the context diagrams used in each knowledge area which will enable a better understanding of how each area interacts and contributes to the overall framework and the determination of an organizational model that suits the company.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

- Carratero, A.G., Gualo, F., Caballero, I., Piattini, M. (2017). MAMD 2.0: Environment for Data Quality Processes Implantation Based on ISO 8000-6X and ISO/IEC 33000. Computer Standards and Interfaces. 139-151.doi: 10.1016/j.csi.2016.11.008.
- DAMA International (2009). The DAMA Guide to The Management Body of Knowledge (DAMA-DMBOK Guide). (1st ed). Technics Publications: New Jersey.
- DAMA International (2017). DAMA-DMBOK Data Management Body of Knowledge. (2nd ed). Technics Publications: New Jersey.
- ITGI (2003). Board Briefing on IT Governance. (2nd ed). IT Governance Institute: Illinois.

5. Khatri, V., Brown, C. V. (2010). Designing Data Governance. *Communications of the ACM*, 53(1):148-152. doi:10.1145/1629175.1629210.
6. Kim, H. Y. & Cho, J-S. (2017). Data Governance Framework for Big Data Implementation with a Case of Korea. In 6th International Congress on Big Data. IEEE 2017. (pp. 384 - 391). doi: 10.1109/BigDataCongress.2017.56
7. Kim, H. Y., Cho, J-S. (2018). Data Governance Framework for Big Data Implementation with NPS Case Analysis in Korea. *Journal of Business and Retail Management Research (JBRMR)*, 12(3), 36-46.
8. Koltay, T. (2016). Data Governance, Data Literacy and The Management of Data Quality. *IFLA Journal*, 42(4), 303-3012.
9. Korhonen, J. J., Melleri, I., Hiekkänen, K., Helenius, M. (2012). Designing Data Governance: An Organizational Perspective. *GSTF Journal on Computing*, 2(4):11-17.
10. Ladley, J. (2019). *Data governance: how to Design, deploy, and sustain an effective program*. (2nd ed). Academic Press: Massachusetts.
11. Loshin, D. (2011). *The Practitioner's Guide to Data Quality Improvement*. Morgan Kaufmann Publishers: Massachusetts.
12. Moore S. *How to Stop Data Quality Undermining Your Business*. Information Technology. [Web site]. (2003). Retrieve from <https://www.gartner.com/smarterwithgartner/how-to-stop-data-quality-undermining-your-business>.
13. Morabito, V. (2015). *Big Data and Analytics: Strategic and Organizational Impacts*. Springer International Publishing: Switzerland
14. Ortega, L., Caro, A., Rodriguez, A., Velasquez, I. (2016). Identifying the Data Quality Terminology Used by Business People. In 34th International Conference of The Chilean Computer Science Society (SCCC) in Chile, 2015. IEEE 2015. (pp. 1 - 8). doi: 10.1109/SCCC.2015.7416576.
15. Otto, B. (2011). Data Governance. *Business and Information Systems Engineering*, 3, 241-244. doi:10.1007/s11576-011-0275-1.
16. Putra, R. I. P. (2021). *Rancangan Data Governance Menggunakan Panduan Data Management Body of Knowledge: Studi Kasus PT Angkasa Pura I (Persero)*. (Unpublished master's thesis). Universitas Indonesia, Jakarta.
17. Panahy, P. H. S., Sidi, F., Affendey, L. S., Jabar, M. A. (2014). The Impact of Data Quality Dimensions on Business Process Improvement. In 4th World Confress on Information and Communication Technologies in Malaysia; 2014. IEEE 2014. (pp 70-73). doi: 10.1109/WICT.2014.7077304.
18. Redman T. C. (2008). *Data Driven: Profiting From Your Most Important Business Asset*. Harvard Business Press: Massachusetts.
19. Sabtiana, R., Yudhoatmojo S. B., Hidayanto, A. N. (2019). Data Quality Management Maturity Model: A Case Study in BPS-Statistics of Kaur Regency, Bengkulu Province, 2017. In 6th International Conference on Cyber and IT Service Management (CITSM) in Parapat, 2018. CITSM. (pp 1-4). doi:10.1109/CITSM.2018.8674323.
20. Sasmitha WH. 2018. *Perancangan Tata Kelola Data Dengan Kerangka Kerja DAMA DMBOK (Studi Kasus: PT Pembangunan Jawa Bali)* (Unpublished master's thesis). Fakultas Bisnis dan Manajemen Teknologi, Institut Teknologi Sepuluh Nopember, Surabaya.
21. Zellal, N., Abdellah, Z. (2016). An Exploratory Investigation of Factors Influencing Data Quality in Data Warehouse. *International Journal of Computer Science and Network Security*. 17(8):161-169

How to cite this article: Agung Ismail, Arif Imam Suroso, Irman Hermadi. Data governance design with the DAMA-DMBOK framework (case study: PT. XYZ). *International Journal of Research and Review*. 2024; 11(8): 210-221. DOI: <https://doi.org/10.52403/ijrr.20240823>
