Data Governance Improvement Recomendation for Peer-to-Peer Lending Sharia Indonesia: Case Study PT ABC

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Article Information	Abstract
	For the Financial Services Authority to determine whether peer-to-peer financial technology may operate legally, accurate data is essential. The IBM Data Governance Maturity Model was used to evaluate data management implementation at P2P Lending Sharia PT ABC. Data and information security management professionals answered a questionnaire for measurement. The verified assessment shows 2.47 maturity means that organization at Managed level. Management agreed to do a gap analysis to improve three domain that lower result there are data value creation, organizational structure and awareness, and data stewardship. The results indicate that the company have to improve it's maturity for regulatory compliance to continue expansion. The results show that well-defined data governance processes are essential for compliance and corporate performance.

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A. Introduction

With the rapid development of information technology, access to information is now easier. Data and information have a crucial role in gaining an organization's business advantage. The movement and direction of an organization's progress are primarily determined by data obtained from various sources, both for marketing purposes, policy making, and others [1]. Organizations that do not understand the importance of managing data and information as a company asset will not survive [2].

P2P Lending sharia according to OJK in 2016, is a company that provides technology-based money lending services accessed through online Platform based on Shariah principles [3]. This platform helps connecting funders to provide financing services to lenders in order to run projects that provided financing by the lenders. Currently, P2P Lending Shariah is part of a non-bank financial institution supervised by the Indonesian Financial Services Authority (OJK), so organizations need to provide regular reports related to operations periodically about the details of funders and lenders. In this case study, the research will focus on discussing the implementation of Data Governance (DG) in a Sharia P2P Lending company in Indonesia by measuring the maturity level of DG (Data Governance Maturity Level) in the Data Management unit. The data management unit is currently under the coordination of the Chief Product Officer (CPO) who has a function as a work unit responsible for managing company data and information in terms of data engineering, data warehouse, data analytics, and data scientists also provide data for regulatory reporting to authority.

The results of the regulatory audit found inconsistencies related to data that regularly reported to OJK, incomplete data according to reporting standards and there were employees outside the authority who had access to the data management system [4]. Error data reporting will be a potential for companies to pay fines in accordance with regulatory provisions. This explanation shows that there are problems in data management in the organization. To find out the current implementation of data governance, it is necessary to conduct an assessment to measure the maturity level of data governance in order to know the problem domains and improvement steps that need to be taken to solve the current problem.

Carry out of DG Maturity Assessment to measure the level of organizational towards the implementation of Data Governance. Measurement of Data Governance Maturity Level will provide an overview of a recommendation regarding the analysis of maturity levels to improve the ability of data governance in the organization. There are several previous studies conducted to measure DG Maturity level conducted by Kurniawan, et al using Stanford Maturity Model Method [5], Prasetyo, H in 2016 that combined IBM Data Governance and DAMA [6] and in 2019 Olaitan, et al conducted alignment of COBIT 5 and ISO/IEC 38500 to design Themes of the Data Governance Maturity Evaluation Model [7]. DGMM will help organization to provide an overview of a recommendation regarding the analysis of maturity levels to improve the ability of data governance in the organization.

IBM Data Governance Maturity Model (DGMM) was chosen as the method to be used for measurement because it has 11 measurement elements that are more complete than the other methods. DGMM will use to assess the baseline condition,

then DG based on DAMA will help to reach maturity level to improve gap of DG implementation in order to solve organization problems.

This research consists of few processes, the first section is explanation related to the background of the research. The second will be discussed the results of the literature study that supports the research. The assessment stage will be discussed in the third section and at the end section will be discussed about the results and conclusions discussed.

B. Literatur Study
Data Management

Data Management is the development, implementation, and monitoring of plans, policies, programs, and practices that deliver, control, protect, and enhance the value of data and information assets throughout the data lifecycle (DAMA) [8]. Data management has similar characteristics to asset management in general, as described in Figure 1.
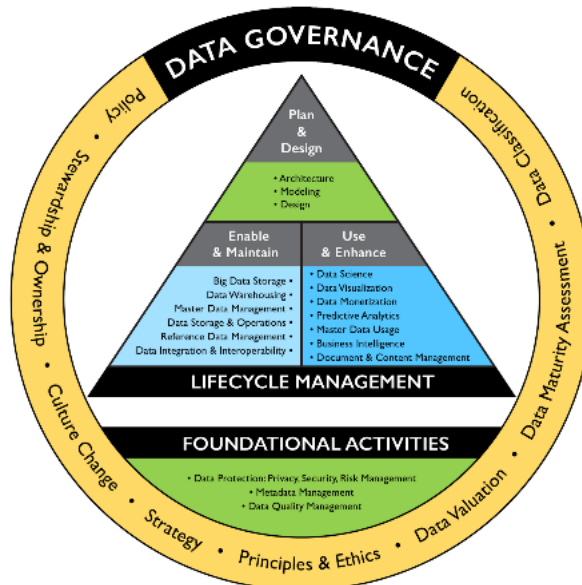

Figure 1. Data Management Body of Knowledge

Data Governance

Data Governance refers to the act of exercising power and control, including planning, monitoring, and enforcement, over the management of data assets [8]. Data governance entails a fundamental division of responsibility between supervision and implementation. Refer to the Data Management Body of Knowledge (DAMA-BOK), the implementation of Data Governance has several benefits for the organization if it is equipped with direct alignment between organizational strategies. The benefits of implementing Data Governance are divided into two aspects [9] as follows:

1. Minimizing Risk
- Risk Management in General: supervision related to data that has a high risk such as financial data, legal data, and so on.
- Data Security: ensure the protection of data assets through control and management regarding data availability, integrity, audit, and security.

- Personal Data: ensuring the management of personal/confidential information, protection of personal data through policies, and compliance with applicable regulations.
2. Process Improvement
- Regulatory Compliance: the ability to respond consistently and efficiently to regulatory requirements.
- Improved Data Quality: The ability to contribute to improving business performance by generating more reliable data.
- Metadata Management: management of a business glossary to define and locate data within the organization; ensure various other Metadata are managed and made available to the organization.
- Project Development Efficiency: SDLC enhancements to address issues and opportunities in data management across the organization, including data-specific technical debt management through data lifecycle governance.
- Vendor Management: performs contractual control related to data, such as cloud storage, external data purchases, sales of data as a product, and data outsourcing operations

Data Governance Maturity Model and Comparison

Data is a critical element in an organization's capacity to meet legal, policy/compliance requirements, and risk management. The use of organizational data such as report generation, decision making, and providing information between business units makes data into valuable information. Reliable exchange of information between unique businesses requires reliable data derived from data management using data governance from inception to deletion[7].

The maturity model is a valuable technique or tool for business processes or certain aspects of an organization because it is an organized and systematic way of doing business [10]. The Data Governance Maturity Model is a tool to assess your organization's current state of Data Governance awareness and effectiveness [11]. The Maturity Model is found in several references that clarify that DGMM is an important factor to know the potential (weaknesses and strengths) of the organizational context with what an organization is adopting [5]. Some frameworks that can be used in conducting a maturity model in an organization are the IBM Data Governance Maturity Model, Stanford Data Governance Maturity Model, Kalido Data Governance Maturity Model, and Dataflux Data Governance Maturity Model [12].

In several literature studies that have been carried out, there are at least several frameworks that can be used in assessing the Data Governance Maturity Model (DGMM) [5].
1. CMMI: Process characterized for organizational applicability [13], [14].
2. IBM: Process characterized for organizational applicability[11], [15].
3. Data Flux: Organizational, Risk, Reward, Process, Technology, Adoption, and Business Capabilities[16].
4. Kalido: Perceived data value, Risk, Data as Enterprise aset[15].
5. Stanford, Focuses on 3 dimensions: People, Policies, and Capabilities with components that include Awareness, Metadata, Formalization, Data Quality, Stewardship, and Master Data [14], [17], [18].

IBM Data Governance Maturity Model

Compared to some of the DGMM models above, IBM data Governance Maturity Model has a more complete element in measuring maturity in an organization. 11 elements need to be measured using the IBM framework [11], elements defined by IBM refer to Figure 2.
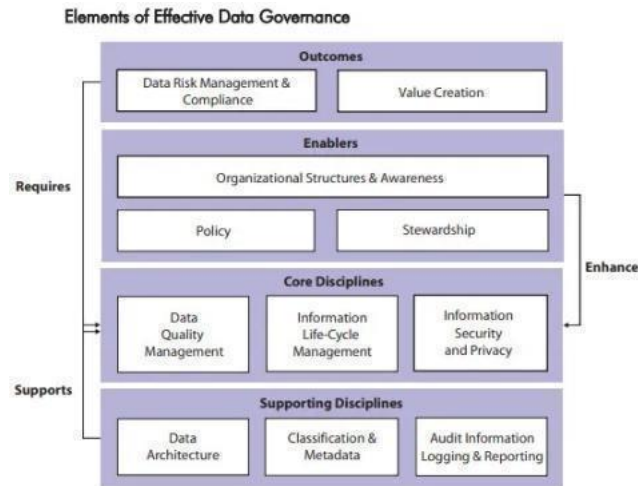

Figure 2. Element of IBM Data Governance Maturity Model

1. Data Risk Management and Compliance: The framework used to carry out risk management assessments in data management.
2. Value Creation: Governing policies relate to how the data as a valuable asset that can support the organization.
3. Organizational Structures & Awareness: Clear segregation of roles and responsibilities between IT and Business units in data management.
4. Policy: Policies are determined in order to support the data management process and are formally agreed.
5. Stewardship: Acting as a quality control to protect data and develop strategies to improve protection and risk mitigation in data management.
6. Data Quality Management: framework for conducting continuous assessments in order to improve the quality and integrity of data management.
7. Information Life Cycle Management: Policy and activities related to the data life cycle starting from acquisition, use, retention and disposal.
8. Information Security and Privacy: Policies and frameworks that govern information security processes and controls to protect and mitigate risks to data assets.
9. Data Architecture: An architectural design that explains all aspects of data, both structured and unstructured, in the system to ensure the availability of services that suit user needs.
10. Classification & Metadata: Semantic defining tools for business and IT terminology, data models, types, and repositories. Understandable metadata for humans and computers.
11. Audit Information Logging & Reporting: tracks and evaluates the effectiveness of governance, risks, and data value.

Each element can then be categorized as being at the maturity level according to the measurement results. There are five levels that each element has the following characteristics[19] shown at figure 3.
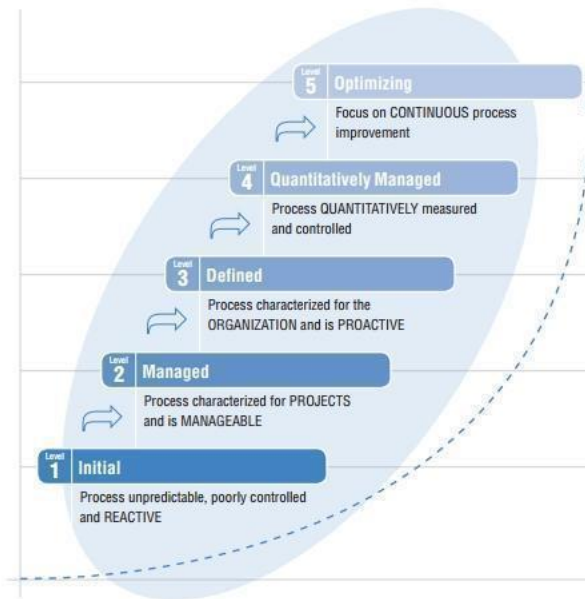

Figure 3. Maturity Level of IBM Data Governance Maturity Model

At Level 1 (Initial), there is minimal or no implementation of data processes or controls. Data management is done in a fragmented and inconsistent manner, with a reactive approach. There is no formalized tracking or management of data, the budget and schedule for data projects are typically exceeded.

At Level 2 (Managed), there is recognition of the significance of data and investment in various projects, such as the development of fundamental infrastructure models and documentation of data processes. Some processes are repeatable and automated, although not all projects have reached this stage. Regulatory controls related to data are documented and accessible, and there is a greater emphasis on metadata.

At Level 3 (Defined), data policies are more clearly defined and free from ambiguity. Some data stewardship practices are in place, and technology is utilized to effectively manage data. Data integration is planned and utilized, and data management practices are widely shared and understood. Risk assessment for data quality and master data management is incorporated into the standard project methodology.

At Level 4 (Quantitatively Managed), data policies are clearly defined and free from ambiguity. Some data stewardship is in place, and technology is utilized to effectively manage data. Data integration is planned and utilized, and data management practices are widely shared and understood. Risk assessment for data quality and master data management is integrated into the standard project methodology.

In Level 5 (Optimizing), the cost of data management becomes more manageable and reduced. Processes are automated and made more efficient. Data management becomes consistent, rigorous, and adopted throughout the entire

enterprise. Data governance becomes second nature and is a collective effort. The return on investment (ROI) for a data project is consistently evaluated and tracked

C. Research Method

In this study, four stages were carried out, tool preparation and assessment materials, information gathering and initial assessment, gap analysis and result validation, final assessment result and define recommendation that could be seen in figure 4.
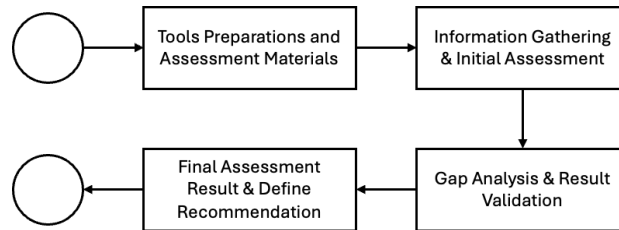

Figure 4. Stages of Research

Tools Preparation and Assessment Materials

At this stage, using questionnaires that has been compiled by Machildon, et al in 2019 was adopted from Soares in 2010 as a tool to measure Data Governance Maturity Assessment. The questionnaire consists of 83 questions divided into 11 dimensions according to the following table 1 [19], [20]. The questionnaire was given to key employees related to data management in the organization, namely Vice President of Data Management, Head of Information Security Management System (ISMS), and IT Plan & Strategy Governance Lead.

Table 1. Numbers of Questions

No	Dimension	Numbers of Question
1	Data Risk Management and Compliance	6
2	Data Value Creation	7
3	Data Organizational Structure and Awareness	6
4	Data Policies and Rules	5
5	Data Stewardship	7
6	Data Quality Management	8
7	Data Lifecycle Management	13
8	Data Security and Confidentiality	10
9	Data Architecture	7
10	Data Classification and Metadata	6
11	Archiving Information Audits and Reporting	8
Total		83

Each question has been provided with five answer choices that indicate the level of maturity according to figure 3 above. Each answer will represent the implementation level of each control from the questionnaire. Based on figure 3, Each answer represents value that mapped the in table 2 [20]:

Table 2. Answer to Maturity Level Mapping

Answer	Level
Initial	1
Managed	2
Defined	3
Quantitatively Managed	4
Optimizing	5

The questionnaire is filled out by the resource person through Google Form and the results can be processed directly conducted analysis using the Google Spreadsheet application. DGM Value is calculated based on the average of all speaker's answers in accordance with the measurement dimensions referring to table 1.

Information Gathering and Initial Assessment

At this stage, interviews are conducted to understand the scope and how governance is applied both in terms of information technology in general and data governance. The next stage involves determining the main sources, which consist of employees related to the implementation of governance in the organization, namely the Vice President of Data Management, Head of Information Security Management System (ISMS), and IT Plan & Strategy Governance Lead. The sources were conducted to fill out the DG maturity assessment. The questionnaire responses were collected and analysed as the basis for determining the initial DG maturity assessment score. The respondents are answered that best fits conditions in the organization, referring to Table 2. The answers to the questions will be validated by ensuring the presence of supporting evidence for their implementation by the researcher to ensure the objectivity of the answers, both through interviews and analysis of policy documents and other internal regulations.

Data Analysis & Result Validation

After the process of filling out the questionnaire and interviews, the received data is then analysed. The data was analyzed to ensure that each questionnaire was answered by the participants objectively by ensuring that each answer was validated through the fulfillment of supporting evidence for each measurement. Supporting evidence can be in the form of policies, procedures or supporting documents that will mapped according to the questionnaire answers to ensure that the maturity value is in accordance with the actual conditions. The analysis results in score of the assessment of the respondents' questionnaires and validation by researcher which becomes the initial result assessment. To analyze the suitability of respondents' answers, an analysis was carried out using Cohen's Kappa Interrater Reliability method to determine the measure of agreement between two or more assessors who provided an assessment of a question [21]. The relationship between the level of agreement and the reliability of the data is shown in table 3. Data with a Moderate level can be stated to have a fairly good and valid value but have not reached a perfect agreement. Meanwhile, Strong and Almost Perfect stated that the data was valid and reliable. To calculate Cohen's Kappa value is done using the following equation.

$$Kappa = \frac{P_{observed} - P_{expected}}{1 - P_{expexted}}$$

Where $P_{observed}$ represent actual agreement observed dan $P_{expected}$ is the expected deal agreement.

Table 3. Interpretation of Cohen's Kappa Value

Level Of Agreement	% of Data Reliability
None	0-4%
Minimal	4-15%
Weak	14-35%
Moderate	35-63%
Strong	64-81%
Almost Perfect	82-100%

Then, the initial result assessment is validated through an interview with the ISMS Head. This confirmation process can influence the initial questionnaire results through an evaluation by a resource person who has the authority to implement governance within the current organizational environment. At this stage, management can also determine the target level of organizational maturity as a reference in making recommendations for improving DG Maturity level.

Finalization of Assessment Result & Define Recomendation

At last stage, based on the confirmation results of the initial DG maturity assessment, an analysis is conducted to determine which dimensions need improvement based on the maturity score and gap analysis to improve maturity level. Subsequently, management also provides recommendations on the priority dimensions for improvement, and each of these dimensions is integrated with the DAMA-DMBOK framework to provide detailed guidance on the implementation of good data governance. The results of this analysis are then used to create recomendations for the organization to enhance the maturity score of Data Governance implementation.

D.   Result and Discussion

The entire research process has been carried out by conducting out all stages sequentially, which are carried out in stages following the research methods.

Information Gathering and Initial Assessment Result

Based on the results of the interview conducted, IT Strategy & Governance has the role and responsibility of managing governance related to information technology and data comprehensively in accordance with the ISO 27001:2013 standard adopted by the organization [22]. The ISO 27001:2013 standard focuses on the implementation of information security such as policies, provisions, and the application of technological controls in implementing information security [23], while a data governance framework is an essential process, including procedures, rules, methodologies, and structures designed to facilitate collaboration among

persons in the effective optimization, collection, storage, use, and dissemination of data, ensuring accuracy and preventing leakage [14].

It was found that the Data unit is under coordination of Chief of Product Officer (CPO) that still focused on being a business partner for providing data source on dashboard analysis needs and mandatory reporting to regulators. Data units already know about the existence of a DG framework but have not been able to implement it optimally because there are no resources that can support implementation. The relationship between IT Governance and Data Units is shown in figure 5.
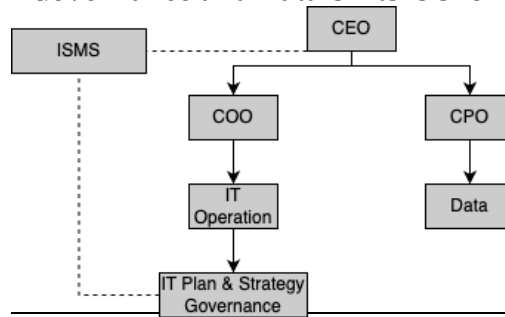
Figure 5. IT and Data Organization

Analysis of the questionnaire and interview responses from senior employees in the organization - the Vice President of Data Management, the Head of the Information Security Management System (ISMS), and the Leader of IT Governance and Strategy - was conducted to obtain the initial measurement of DG maturity. Based on the results of the questionnaire, an analysis was carried out to ensure that each respondent's answer was in accordance with the current conditions by relating supporting evidence in the form of policies, procedures and other documents with researcher perspective. The results of the questionnaire were also analyzed using the Inter-Rater Reliability method by calculating the Cohen's Kappa score to determine the consistency of the assessment given by the respondents. The results of the analysis show that the average score value of Cohen's Kappa is 53%. Tabel 4 shows that the detail respondent result have a moderate agreement although there are some differences in agreement but can be assessed as a fairly good agreement value [21].

Table 4. Calculation Agreements

No	Dimension	Result
1	Data Risk Management and Compliance	67%
2	Data Value Creation	86%
3	Data Organizational Structure and Awareness	83%
4	Data Policies and Rules	80%
5	Data Stewardship	57%
6	Data Quality Management	38%
7	Data Lifecycle Management	31%
8	Data Security and Confidentiality	70%
9	Data Architecture	14%
10	Data Classification and Metadata	33%
11	Archiving Information Audits and Reporting	67%
	Cohen's Kappa	**53%**

The result of initial assessment process of all DGMM elements has been carried out using the IBM method consisting of 11 dimensions shown at table 5. Based on the results of the initial assessment, the average value of the organization's maturity level is 2.35. This means that currently, the organization is still at the Managed level (level 2). The results show that the order of the lowest value (below 2 points) of the assessment results is in 3 elements – Data Stewardship at 1.52, Data Value Creation at 1.57, and Data Organization and Awareness at 1.61.

Some elements have a fairly high value even though they have not reached the targeted value (3-Defined) as the result of interview, including Data Risk Management and Compliance with a value of 2.72, Data Security and Confidentiality with a value of 2.80, and Archiving Information Audits and Reporting with a value of 2.79.

Table 5. Initial Assessment Result

No	Dimension	Initial Value
1	Data Risk Management and Compliance	2.72
2	Data Value Creation	1.57
3	Data Organizational Structure and Awareness	1.61
4	Data Policies and Rules	2.93
5	Data Stewardship	1.52
6	Data Quality Management	2.21
7	Data Lifecycle Management	2.44
8	Data Security and Confidentiality	2.80
9	Data Architecture	2.48
10	Data Classification and Metadata	2.61
11	Archiving Information Audits and Reporting	2.79
	Maturity Level	**2.35**

Data Analysist and Initial Result Result Validation

Based on the results of the initial assessment, a confirmation process of these results was carried out by conducting an interview stage with the management. The interview was conducted with one of the unit leaders by ensuring that every question and the results of the value of initial assessment was reviewed by ensuring that every question and the results of the initial assessment were following the conditions in the organization. The summary of confirmation result is shown on table 6.

Table 6. Confirmation Assessment Result

No	Dimension	Final Value
1	Data Risk Management and Compliance	3.00
2	Data Value Creation	1.71
3	Data Organizational Structure and Awareness	1.83
4	Data Policies and Rules	2.20
5	Data Stewardship	1.57
6	Data Quality Management	2.63
7	Data Lifecycle Management	2.64
8	Data Security and Confidentiality	3.00
9	Data Architecture	2.43
10	Data Classification and Metadata	2.83
11	Archiving Information Audits and Reporting	3.00
	Maturity Level	**2.46**

Based on the confirmation results of the initial assessment, there are several elements that have increased value to level 3 (Defined), Data Risk Management & Compliance from 2.72, this is supported by the existence of an Risk Management procedure documents that provide framework to assessment of enterprise risk management, Data Security and Confidentiality element previously had a value of 2.80 supported by the existence the procedures for the Use of Information Assets, Cryptography Procedures and Access Rights Control. Archiving Information Audits and Reporting increased from 2.79 because during the confirmation, the audit process and routine inspection are part of the implementation information security management system, it has been carried out every year as a mandatory implementation of the ISO 27001 standard. Several supporting documents mentioned at the time of the interview section also have some impacts on increasing the value of other elements that can support evidence the implementation of data governance.

The three lowest scores on the assessment results that need to be improve are, Stewardship Data as score 1.57, Data Value Creation with score of 1.71 and Data Organization Structure and Awareness with score of 1,83. As the part of confirmation, the respondent also confirmed to provide the DG Maturity Level target that needs to be set by the organization, management hopes will be at the 3 (Defined) for dimensions that still have low value. Overall DG maturity level is 2.46 that means organization is on Managed Level. A summary of the assessment values in table 5 and table 6 can be seen in the following radar diagram on Figure 6.
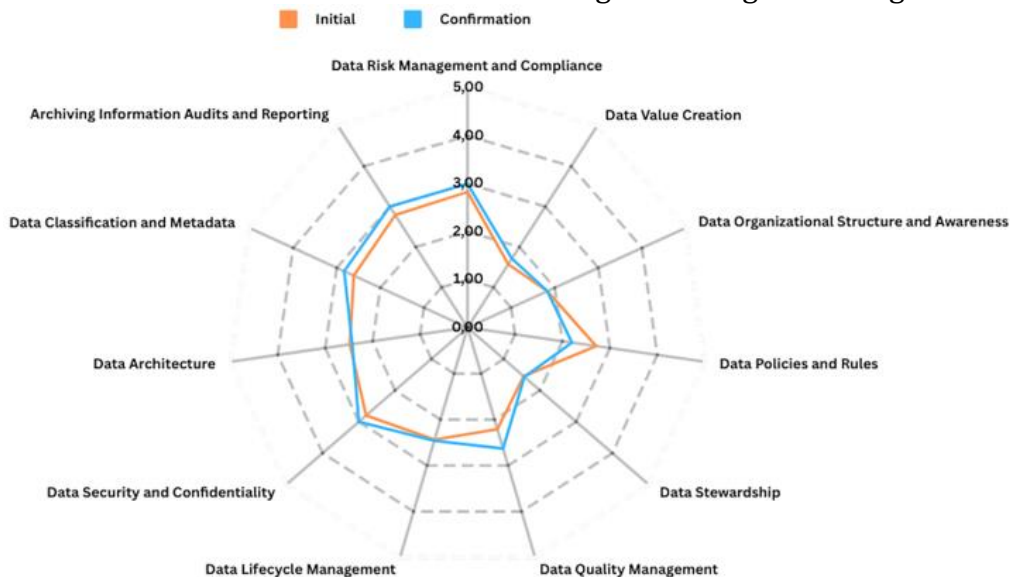

Figure 6. Radar Diagram of Initial and confirmation Result

At this stage, the respondent also confirmed to provide the DG Maturity Level target that needs to be set by the organization, management hopes will be at the level 2 - 3 (Managed – Defined) for dimensions that still have a value below 2.

Discussion

After confirming with one of the leaders, it was determined that some aspects were assigned low values due to the prevailing conditions and the absence of management that met expectations. There are several parts that still have a

significant gap in relation to the aim. These elements include Data Value Creation (1.71), Data Organization and Structure Awareness (1.83), and Data Stewardship (1.57) and Other dimensions that are still at level 2 can increase to level 3 as follows.

Data Value Creation (1,71)

It's means that organizations have not maximized the value that can be generated from their data. Determining and measuring the value of data is very important for the company. Research conducted by Lim et.al has identified 9 key factors in information-intensive services (IIS) that can be a reference in conducting data value creation [24]. To increase maturity at level 2, organizations need to conduct an initial assessment of data quality to establish data quality metrics so that it can help organizations to identify data inconsistencies, duplications and inconsistencies [9], [25], [26]. As for level 3, organizations also need to establish policies related to data quality so that they can maximize data as a support for decision-making [9], [25], [26].

Data Organization and Structure Awareness (1.83)

The Data Organization and Awareness elements are still at the initial level, which means that there is still instability in organizing data and awareness of data itself in an organization. At level 1, data is considered only as a supporting process of production so that a system can run without considering miscellaneous factors to the data. Organizing and building the level of awareness of data needs to be considered at least at maturity level 2 [11], namely: managed. Thus, the data that is used to support a certain system or production begins to be responsible from the top management level to the level of implementers and users of each existing data.

In addition, with the same understanding of organizing data and building the same awareness because of the implementation of the elements of data organization and awareness, an organization will also benefit as well as knowing how much maturity level an organization is currently and people in the company can determine where the organization will go in the future. To improve 2nd level of maturity, organization have to define data governance council to manage strategy, policies, standard, architecture, regulatory compliance, issue management, projects, asset valuation and communication line for Data Governance [9]. Agar organisasi dapat naik ke maturity level 3 perlu menetapkan peran dan tanggung jawab masing-masing pihak antara tim IT dan bisnis terkait dengan pengelolaan data[11].

Data Stewardship (1.57)

To help stewardship issue, organization can be held to mapping to stewardship dimension, which means that operational and coordinative side must be clearly defined [5]. Presentations made by [27] that the first strategic step in the implementation of data stewardship is to determine data stewardship based on 4 types: business data steward based on the representation of business functions, operational data steward, project data steward, and technical data steward. Table 7 is the gap analysis of each role observed based on the interview.

Table 7. Gap Analysis of Data Stewardship Type

Steward Type	Gap Analysis
Technical Data Steward	There is a technical role but the definition of scope is not clear enough.
Domain Data Steward	There is no specific data steward role, even so per domain basis.
Project Data Steward	There is no specific data steward role, even so per project basis.
Operational Data Steward	There is no specific data steward role, even so per operational basis.

Some of the factors that need to be considered by organizations according to [27] in the implementation of stewardship data. Table 8 is the gap analysis of each factor based on the interview.

Table 8. Gap Analysis of Implementation Factor

Factor	Gap Analysis
Existing data-centric skills	Technical skill sets are already developed, but non-technical skill sets are required to be developed.
Company culture	Company culture for data stewardship is not yet developed.
Reputations of data	Data is already reputable enough.
Current view of data ownership	Data ownership is not yet clearly defined between divisions
Understanding of data measurement	No clear measurement parameters.
Reuse of data	There is duplication of data between divisions.

Based on the explanation above, In order to reach level 2, the organization needs to identify stewardship in each area or work unit so that the data owner will also be identified [11]. To increase the maturity level to 3 organizations, it is necessary to define data governance, stewardship roles and responsibilities in organization as part of Data Council and establish policies and procedures to be able to support data management activities [9], [14].

Recommendations are also given for 5 dimensions that still have a maturity level that has not reached the target in accordance with management expectations at level 3 (Managed) with detailed recommendations in table 9 [9], [11].

Table 9. Recommendation of 5 Dimensions

Dimension	Recomendation
Data Policies and Rules	Establish formal policies and evaluate compliance with applicable regulations both internally and externally
Data Quality Management	Establish formal measurement of data quality levels and implementation of technology to be able to maintain data quality
Data Lifecycle Management	Establish clear and formal policies related to the data lifecycle
Data Architecture	Setting data architecture standards and how data is integrated
Data Classification and Metadata	Carry out data classification procedures consistently and establish data catalogs to be able to equalize perceptions related to data functions and roles in the organization

To summarize the gap and future improvement, several strategies can be implemented by organization refer to J. Ladley (2020), to increase the maturity level of Data Governance. The Recomendation difined into 3 domains, People, Process and Technology [11], [28].

People

Establish special organizational structures that focus on data governance, such as a data governance council to support the function of Data Governance [8], [14], [19]. An objective vision, data management in the organization becomes more optimal following existing quality standards. As well as forming a data management support organization such as Data Stewardship which is currently functionally carried out, but has not been determined related to its roles and responsibilities. The determination of the roles and responsibilities of data stewards is based on 4 elements, namely Business Data Steward, Operational Data Steward, Project Data Steward, and Technical Data Steward [14], [19].

Process

Organizations need to develop policies, procedures, business rules and matrix related to data management so that the roles and responsibilities of each data user can be documented [8], [14], [19]. The confirmation results stated that the data management procedure is currently still in the process of being prepared and reviewed by the relevant parties. The process of regularly reviewing the implementation also needs to be carried out periodically to ensure compliance with applicable regulations [7], [13], [18].

Technology

From the aspect of technology, organizations today have used quite modern technology by utilizing cloud services, but it is necessary to pay attention to information security factors to prevent data leakage and unauthorized access [11].

E. Conclusion

This research was conducted on one of the P2P Lending Sharia in Indonesia to measure the maturity level of Data Governance implementation using the IBM Data Governance Maturity Model to help organizations overcome data integrity problems

submitted to regulators. The assessment process was carried out by providing questionnaires to key employees who have a role in information and data technology governance consisting of 11 dimensions and 83 questions with answers showing the level of application (1-Initial, 2-Managed, 3-Defined, 4-Quantitively Managed, 5-Optimizing).

Based on the results of the confirmation, the Data Governance Maturity Level value was obtained at 2.46 (Managed Level). This shows that the implementation of data governance in organizations is still not optimal walaupun sudah terdapat 2 dimensi yang memiliki tingkat maturitas pada level 3, Data Risk Management Compliance dan Archiving Information Audits and Reporting. 8 domains have a value above level 2 that need to be upgraded to level 3 (managed) , namely Data Risk Management & Compliance (3), Data Policies & Rules (2.2), Data Quality Management (2.63), Data Lifecycle Management (2.64), Data Architecture (2.43), Data Classification & Metadata (2.83). However, there are still 3 dimensions that have low values where significant improvements need to be made, namely Data Value Creation (1.71), Data Stewardship (1.53) and Data Organizational Structure and Awareness (1.83) which are priorities to be improved by setting recommendations based on references from research and the DAMA-DMBOK framework.

Improvement recomendation that need to be implemented immediately by organizational management consist of determining the organizational structure, data governance, roles and responsibilities of all related parties include data stewardship (People), establish data management policies and procedures to be immediately finalized and applied to the organization (Process), adopt a data management system to support the implementation of data governance (Technology) to minimize risk of data leakages and lack of integrity.

This study provides recommendations on how organizations can improve the maturity value of Data Governance from 3 aspects of People, Process and Technology. Further research is expected to provide an overview of the implementation strategy for more comprehensive recommendations so that it can be a reference in each process.

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