

# IT Governance: Performance Assessment of Maturity Levels of Rural Banking Industry

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**Abstract**—Infrastructure resources and application portfolios of IT services have not been optimally used in the rural banking industry. In addition, work units are apt to be partially managed. Furthermore, there has been no performance assessment on the contribution of IT governance to ensure the alignment of businesses and IT strategies. The purpose of this study was to determine the capabilities of application portfolios of IT services through the implementation of management structures and IT processes in terms of domains of EDM and DSS. The research was in the form of a survey. A mixed method through an explanatory design and follow-up explanation was applied. A total of 82 respondents, living in West Kalimantan, Indonesia, completely filled in online questionnaires. The COBIT 5 framework was the approach to assessing maturity levels of IT governance. It was found that the performance value of maturity was at Level 3 (established process). In other words, an expected value was not achieved. So far, the use of application portfolios of IT services in the rural banking industry has only been limited to the standardization of procedures and documentation systems. Appropriate synchronization and obvious interoperability were absent. Also, there was no consistency in assuring resource optimization and continual management of implementing the procedures and using application portfolios of IT services.

**Keywords**—IT Governance, IT Services, Maturity Level, Performance Assessment, Application Portfolios.

## I. INTRODUCTION

Attempts made to improve operational efficiency and service quality in the banking industry are inseparable from roles of Information Technology (IT). They are extremely strategic for such the industry to win competitions [1]. Nowadays, dimensions of IT development are influenced by various transaction platforms of digital transformation reflected by the emergence of financial technology (fintech) companies. Fintech is innovation combining digital technology and financial system so that all forms of financial transaction become more practical, more effective, and easier [2]. Its growth tends to be more dynamic and flexible. Thus, it can become a major threat to the survival of the national banking industry, including rural banks (locally known as BPR). They are financial institutions primarily providing the services of time deposits, savings, and/or other equivalent forms, and distributing funds to the public [3]. The presence of fintech is certainly a challenge for BPR since customers increasingly expect speed and convenience in conducting financial transaction. Readiness for digital transformation becomes a top priority sustainably implemented. In carrying

out digital transformation, IT governance should exist to ascertain effectiveness of IT services excellently [4].

This fact brings an essential implication to the management and stakeholders. It is noted that IT governance is requisite now and in the future. The appropriate, accurate, and relevant one can increase expected values for all stakeholders [5]. For each BPR customer, it is substantial to guarantee business processes and appropriateness of conducting financial transaction. The performance of IT governance of BPR is similar to that of commercial banks. Availability of infrastructure of IT application portfolios becomes a requirement in enhancing the capabilities to compete nationally [6]. Currently, the BPR sector is undergoing the transformation in this digitalization era. This process is a tangible manifestation of maintaining the existence and increasing the customer loyalty [7]. IT governance becomes an important factor for BPR to carry out digital banking businesses, optimize operational costs, and innovatively enhance the performance of information services. To ensure proper IT governance, it is necessary to conduct performance assessment of maturity levels of IT processes. Hence, gaps between actual and expected conditions in relation to IT services and management of BPR business are identifiable.

Maturity values importantly guarantee alignment and capabilities of application portfolios of IT services [8]. Solutions and prevention of risks of failure, and incompatibility of all application processes can refer to appropriateness of current and upcoming data management mechanisms of financial transaction and banking digitalization services [9]. Maturity levels of IT governance contribute to planning and assurance of effective and efficient IT services for BPR in providing the services to their customers [10]. In practice, nevertheless, it turns out that majority of these banks have not fully succeeded in empowering the aforementioned portfolios to meet customer needs. This condition is reflected in the expensive IT infrastructure investment and no seriousness of IT management [11].

Implementing IT governance and managing the application portfolios of IT services are not only limited to provision of products and financial services, but also to real-time integration, synchronization, and interoperability. This affirmation is supported by previous studies [12,13,14]. Maturity levels of IT governance reflect compliance and alignment of these portfolios, and overall BPR strategies.

Their performance shows IT processes in an obvious and structured manner to facilitate current and upcoming supervision, evaluation, and productivity of BPR in West Kalimantan.

Survey results indicate that on average, failure occurs due to incompetence and unready infrastructure of IT governance. Numerous obstacles include poor IT infrastructure, low digital literacy of financial technology, poor data security, unclear standardization and regulations of implementing the cloud computing, limited skills and knowledge of system and mechanisms of managing IT services, limited budget, and low manager commitment. Moreover, computerized system and application portfolios of IT services are managed partially by each work unit (specific IT departments are absent). Additionally, IT management and investment tend to be partial and are only for units needing them. Finally, there has never been performance assessment of the contribution of IT governance related to these portfolios to ensure strategy alignment of businesses and IT.

Several indications are found in previous studies. Evidently, mechanisms of monitoring and evaluating the IT services and access rights tend to be centralized for certain work units. Moreover, investment decisions and use of application portfolios of IT services only last a short time and still focus on operational finance [15,16]. Also, limited knowledge and capabilities of human resources in the IT field exist. The operation additionally runs without innovation and IT capabilities [17]. Lastly, IT project development is apt to fail because there are no comprehensive planning of IT architecture and formation of structured steering committee. It is noted that maturity values of IT governance are restricted to data processing of internal banking [18].

Complications hamper the effectiveness of IT services and productivity in providing the financial transaction services to BPR customers. This statement is closely linked to IT service processes in terms of domains of Evaluate, Direct, and Monitor (EDM) as well as Deliver, Service, and Support (DSS) in current and upcoming conditions. The novelty and contribution of this research are to build, map, and align all processes of IT and management based on performance values of maturity levels of IT governance. Reducing the risks and having assurance of investment management of IT resources through application portfolios of IT services improve the provision of information services and financial transaction in order to facilitate flexibility and accessibility of information to all BPR customers.

Problems of this research were formulated: (a) To what extent were the gaps of performance values of maturity levels of IT governance through application portfolios of IT services with an emphasis on domains of EDM and DSS, and (b) values of managerial implications regarding the use of these portfolios? Furthermore, (c) what were the recommendations for the relevance of corrective actions to overcome non-conformity and gaps in having improved IT governance? This study aimed to determine the extent of capabilities of aforementioned portfolios through the application of management structures and IT processes, especially in terms of EDM and DSS in improving the information services and financial transaction for all BPR customers.

## II. LITERATURE REVIEW

### A. *IT Governance*

IT governance is the responsibility of the board of directors and executive management in representing the alignment of IT strategies with the businesses through the development and maintenance of an effective control of IT services responsibly [19]. Such governance has a critical role in management and assurance of the performance of application portfolios of IT services through involvement of the top management of organizations. It includes decision rights and accountability to encourage desired behavior of using IT and actualizing IT goals and objectives efficiently and effectively [20]. It is a set of processes for managing and aligning the portfolios and IT project resources, and monitoring IT performance [21]. Organization success is highly dependent on IT governance based on overall structures, processes, and IT empowerment mechanisms. It is designed not only to achieve external efficiency, but also to guarantee that all internal activities are well documented. It has a crucial contribution as appropriate solutions to overcome the increasing changes and complexity of IT processes [22].

### B. *Process Capability Levels*

The performance of IT processes in organizations can be a benchmark and self-assessment for IT management to find out the extent of the implementation of IT governance. Capability levels are a model used to describe IT service processes which have been based on expectations. The poor ones require special attention [23]. Capability levels of such processes represent maturity values of IT governance starting from Level 0 (incomplete) to Level 5 (optimizing) [24]. Management and controls of maturity levels of IT service processes are based on results of the organization evaluation. For definitions, an assessment method is used. It can identify whether organizations have met acceptable management standards and been in line with expectations. Maturity levels can be dissimilar for each IT process based on fulfillment criteria [25].

### C. *Domain of Evaluate, Direct, and Monitor (EDM)*

EDM domain includes assessment and optimization of risks and resources, including practices and activities, evaluating business strategies and directions for application portfolios of IT services and result observation. This domain is divided into EDM01 (ensure set-up and maintenance of governance framework), EDM02 (ensure benefit deliveries), EDM03 (ensure risk optimization), EDM04 (ensure resource optimization), and EDM05 (ensure stakeholder transparency) [26].

### D. *Domain of Deliver, Service, and Support (DSS)*

DSS domain covers protection of organization information assets to maintain an accepted level of information security risks in accordance with the security policy. This domain is divided into DSS01 (manage operation), DSS02 (manage service requests and incidents), DSS03 (manage issues), DSS04 (manage continuity), DSS05 (manage security services), and DSS06 (manage business process controls) [26].

## III. RESEARCH METHOD

This study was in forms of the survey and a mixed method referring to a convergent triangulation model through an explanatory design and follow-up mechanisms [27]. Initially,

all data were collected quantitatively and analyzed for all rural banks in West Kalimantan. The respondents were 98 leaders and managers of BPR. Primary data were obtained through questionnaires distributed to them online via Google Forms. 82 of them, however, gave complete answers and submit them (response rate = 83.67%). Questionnaires distributed were modified from previous research. Validity and reliability were tested by referring to the previous literature review. Next, data were processed with Likert scales with an interval ranging from strongly agree (Score 6) to strongly disagree (Score 1) [28]. Evidently, ordinal values of such scales provided more accurate data [29]. In-depth interviews with five people selected as key informants were additionally conducted to validate the previous answers. The larger the coefficients of validity and reliability were, the more consistent the instruments used would be so that results were acceptable [29]. Finally, all answers were reprocessed by referring to each process of IT service capabilities for domains of EDM and DSS to make the maturity values more obvious.

To assess the performance of the maturity level of each process of IT service capabilities, the COBIT 5 (Control Objectives for Information and Related Technology) approach was used. It was the only framework for assessing that of management capabilities and the management of application portfolios of IT services [30]. Performance assessment was carried out to identify the levels of certain process capabilities and determine the following steps for improvement in achieving the alignment of management and IT governance. There were six process capability levels assessed (see Table I) and scales used to assess process attributes (see Table II) [30]:

TABLE I. COBIT 5 PROCESS CAPABILITY MODEL

Level	Description
Level 0: Incomplete process	The process is not implemented or fails to achieve its process purpose.
Level 1: Performed process	The implemented process achieves its process purpose.
Level 2: Managed process	The previously described performed process is now implemented in a managed fashion (planned, monitored and adjusted) and its work products are appropriately established, controlled and maintained.
Level 3: Established process	The previously described managed process is now implemented using a defined process that is capable of achieving its process outcomes.
Level 4: Predictable process	The previously described established process now operates within defined limits to achieve its process outcomes.
Level 5: Optimizing process	The previously described predictable process is continuously improved to meet relevant current and projected business goals.

TABLE II. RATING SCALES

Abbreviation	Description	% Achieved
N	Not achieved	0 to 15% achievement
P	Partially achieved	>15% to 50% achievement
L	Largely achieved	>50% to 85% achievement
F	Fully achieved	>85% to 100% achievement

#### IV. RESULT AND DISCUSSION

Maturity levels of IT governance for BPR performance were assessed to meet the standards of IT service processes and relationships with the management of application portfolios. To measure capability levels of such processes, maturity levels can be referred to. Tables III and IV showed the calculation in terms of domains of EDM and DSS.

TABLE III. MATURITY LEVELS OF EDM DOMAIN

Domain	Process	Current Maturity	Gap
EDM01	Ensure set-up and maintenance of governance framework	3.15	0.844
EDM02	Ensure benefit deliveries	3.33	0.667
EDM03	Ensure risk optimization	3.13	0.865
EDM04	Ensure resource optimization	3.12	0.878
EDM05	Ensure stakeholder transparency	3.16	0.834

TABLE IV. MATURITY LEVELS OF DSS DOMAIN

Domain	Process	Current Maturity	Gap
DSS01	Manage operation	3.77	0.222
DSS02	Manage service requests and incidents	3.88	0.111
DSS03	Manage issues	3.87	0.124
DSS04	Manage continuity	3.48	0.511
DSS05	Manage security services	3.77	0.221
DSS06	Manage business process controls	3.89	0.101

Regarding Tables III and IV, all maturity values of EDM and DSS failed to reach Level 4 (predictable process), because they still indicated significant differences of values. They reflected regulations and maintenance of BPR with procedures currently managed and implemented, and capabilities to carry out process commitment when there was financial transaction (planned, monitored, and constantly adjusted). In terms of EDM, the highest and lowest gap values were respectively represented by EDM04 (0.878) and EDM02 (0.667). For DSS, nonetheless, the highest and lowest gap values were possessed by DSS04 (0.511) and DSS06 (0.101). Therefore, all of these processes unsuccessfully reached an expected maturity level and were still at Level 3 (established process). Averages found in accordance with their capabilities and maturity values obtained were respectively 3.17 and 3.77 (established process).

The reflection of EDM04 at Level 3 (established process) was that optimizing IT resources was already implemented, managed, and maintained to ascertain that they could be used optimally. Meaningfully, for evaluation, BPR always ensured that IT infrastructure could function well. Monitoring and maintenance of all IT service application equipment could, therefore, be always conducted regularly. To carry out its operational activities, BPR should always strive for readiness and involvement of personnel to maintain, control, and operate the IT equipment so that everything could work optimally. Despite the fact that existing IT service infrastructure was adequate, the capacity of IT human resources was limited. The imbalance between IT resources and users or implementers further resulted in unideal IT services received. Moreover, the IT division always monitored IT infrastructure directly and simply without tools

commonly used by organizations in the IT sector. The scale was at the L stage (largely achieved) with a size of >50% to 85%. Authentic evidence showed that a systematic approach was carried out and a significant achievement of assessed process attributes was determined (see Figure 1). Despite some weaknesses, most achievements existed.



Fig. 1. Maturity Levels of EDM Domain

Maturity levels and capabilities of DSS04 at Level 3 (established process) meant that planning was already carried out, established, and maintained. It further allowed businesses and IT to respond to incidents and disruptions. Business processes could additionally be continued on a critical scale and IT service applications were required. Availability and completeness of information at an acceptable level should be maintained and empowered by the BPR management. Nonetheless, the executive management needed to establish policies and sustainable coverage related to businesses which were in line with the objectives of the banking sector and stakeholders, to evaluate continuity management of businesses, and to select cost-effective and sustainable continuity strategies assuring the recovery of BPR in encountering with the disasters.

For the scale, an L stage was reached (largely achieved) with a size of >50% to 85%. The authentic evidence showed that for a systematic approach and achievements in relation to operation management and information distribution, system and mechanisms for managing the requests of application portfolios of IT services were possessed. Besides, problem management system already consisted of patterns and structures, and recorded relevant solutions as a knowledge base. System of managing the services continuously to realize rapid responsiveness and measurable processes, and comprehensive security procedures for each flow of information also existed. Lastly, in business processes, each activity and banking operation became more structured and easier to control.

Failing to reach an F stage (fully achieved) with a size of >85% to 100%, several weaknesses pertaining to attributes existed in terms of assessment. Despite this, most of them were achieved. Clearly, achievements and a systematic and significant approach to previously achieved attributes were already determined. Continuity requirement analysis was further conducted to produce good strategies of businesses and technology. Nevertheless, no report was made. Moreover, potential scenarios providing the development of events that could lead to incident distribution were provided. Ultimately, those making the key decisions were determined to enable submissions of continuity plans. Documentation of required actions was, however, absent (see Figure 2).

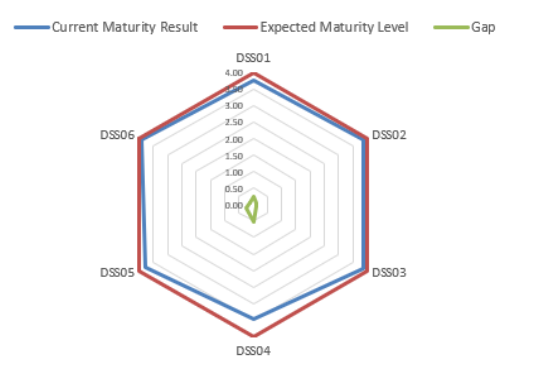


Fig. 2. Maturity Levels of DSS Domain

The implication of the research results from a managerial perspective revealed that the whole details of processes had values of different priority types in terms of the needs for immediate improvement. On average, they represented IT governance with priority types. Maturity performance values brought needs for defining the maturity levels of processes. Comprehensibly, better performance measurement results or fulfillment of defined performance measures allowed such levels to increase. Another implication was that the management continued examining and assessing current and upcoming requirements for application resources of IT services. Resource management principles should also be applied to enable the allocation of BPR resources. Following this, various IT services should be provided for each employee in order to implement procedures based on the scopes of business function units. Also, it was necessary to monitor goals and metric system of resource management of IT service applications.

Besides, there should be determination of policies and continual business scopes in line with goals and objectives of BPR and its stakeholders. It was further suggested that banking business continuity for the lower middle class was implemented and a cost-effective and sustainable strategies were chosen to guarantee the recovery of events that could thwart responsiveness for customers. Developing and mapping business plans in stages, especially the critical patterns and clarity of banking financial data processing based on strategies of information service readiness was another suggestion. Additionally, procedures and financial guarantees should always be transparent and prioritized security in the financial transaction for BPR customers. Also, it was requisite to regularly review continuity capabilities of the management to ascertain suitability of IT governance in terms of application supports and align adequacy and effectiveness. Finally, plan changes of financial transaction for BPR customers could be managed based on the controls.

Concerning the recommendations of reducing the gaps with the highest to the lowest values of EDM Domain (EDM04, EDM03, EDM01, EDM05, and EDM02), constant examination and assessment of current and upcoming needs for resources linked to IT services, choices of resource strategies, and principles of allocation and management in meeting banking needs, especially in the context of BPR should be optimally conducted. A number of required activities to be carried out were (a) examining and assessing the current and upcoming strategies, making an option for providing IT resources, and developing the capabilities to meet these needs, (b) determining the principle guides of allocation and management of resources and capabilities so

that IT could meet BPR needs in accordance with approved priorities and budget constraints, (c) reviewing and approving resource plans and organizational architecture strategies of BPR to provide values and reduce risks with allocated resources, (d) understanding the requirements to align resource management with planning of finance and human resources, and (e) defining the management principles and enterprise architecture controls.

On the other hand, regarding the recommendations of reducing the gaps with the highest to the lowest values of DSS Domain (DSS04, DSS01, DSS05, DSS03, DSS02, and DSS06), setting the policies and scopes of business continuity which were in line with objectives of banks and stakeholders should be conducted. Moreover, evaluating management patterns of business continuity and selecting cost-effective and feasible sustainability strategies ensuring recovery and continuity of banking management in encountering the disasters or other major disruptions were highly recommended. Next, business continuity plans based on strategies documenting the IT service procedures and standards of readiness for use in any incidents and enabling the IT services of BPR to sustain could be developed. Another suggestion was testing the continuity arrangements regularly to execute recovery plans against predetermined outcomes and enable innovative solutions to make verification on the plans of each BPR activity that would work in line with expected service readiness of IT infrastructure over time. Besides, regular management reviews of continuity and capabilities could be conducted to guarantee suitability, adequacy, and scopes of effectiveness. Also, plan changes should be managed in accordance with controls so that continuity plans remained updated and could sustainably reflect actual business requirements of BPR, improving the performance in terms of service provision for all BPR customers. Ultimately, regular training sessions on procedures, roles, and responsibilities for all internal and external parties should be held in case of disruptions.

A number of required activities to be carried out were (a) identifying business processes and internal and outsourcing services which were crucial for operating processes of BPR, (b) identifying the key stakeholders, roles, and responsibilities to approve policies and scopes of business continuity of BPR, (c) establishing the approved documentation of minimum policy objectives and such scopes, and embedding the needs for continuity planning in the service culture of BPR, and (d) identifying the critical and supporting business processes and IT services related to implementation of overall application portfolios in business units of BPR.

This research was limited in terms of needs and importance of IT governance, and assessment of performance of maturity levels of rural banking industry in West Kalimantan. This limitation became an obstacle to generalize research findings of implementing IT governance to other provinces due to environment differences. In addition, this study was only for the aforementioned industry and excluded the discussion of the others. Results found in it essentially contributed to the management of BPR, not massively using IT services to accelerate and optimize processes of providing the products and services for its customers.

## V. CONCLUSION AND FUTURE RESEARCH

Ascertaining that resource needs of IT services can be optimally met, IT costs should be optimized. There is also a possibility of upgrading IT infrastructure pertaining to benefits of realization and readiness for future changes. Optimal capabilities of IT governance and management policies become complements. Resources of application portfolios of IT services are additionally allocated to meet process priorities of BPR. Besides, optimal use of procedure construction and IT service standards are achievable through structured document values and access rights for monitoring the security of financial information services.

This research can be continued by emphasizing the relationships among domains of APO (Align, Plan, and Organize), BAI (Build, Acquire, and Implement), and MEA (Monitor, Evaluate, and Assess) to obtain Key Performance Indicators (KPI) and Key Goal Indicators (KGI). Such indicators are determined through a combination of any of the domains. ME gaps can provide more detailed information on implementation of IT governance and management aspects for all rural banks in West Kalimantan. The alignment of business strategies of BPR and application portfolios of IT services is important in improving the performance of information services.

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