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Technology Governance Analysis and Design Information on the Application "CatatMak"

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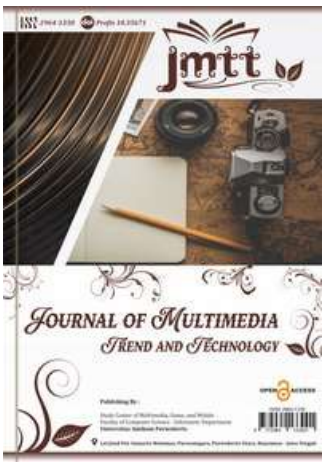

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ABSTRACT

This paper presents the analysis and design of information technology (IT) governance for the CatatMak financial recording application developed by PT Jadi Kaya Raya Bersama. The study aims to identify weaknesses in the current IT governance, including API instability, insecure authentication, lack of monitoring and fallback systems, and the absence of integration with digital financial services. Using the COBIT 2019 framework as a reference, this research employs a qualitative descriptive approach through observation and interviews to assess governance gaps and formulate improvement strategies. The proposed design includes short- term solutions—such as API monitoring implementation, authentication enhancement, and SLA development—and long-term initiatives like financial system integration, SOP creation, and IT security team formation. Key Performance Indicators (KPI) and Key Risk Indicators (KRI) are also defined to ensure measurable evaluation of IT governance performance. The results are expected to improve system reliability, security, and operational efficiency in supporting the company's digital transformation goals.

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INTRODUCTION

PT Jadi Kaya Raya Bersama is a financial technology company focused on empowering micro, small, and medium enterprises (MSMEs) and individuals through digital financial record-keeping solutions. Their main product is the CatatMak app, a platform that combines the ease of use of a WhatsApp chatbot with the power of cloud storage to record daily financial transactions instantly and efficiently. Designed for users without an accounting background, the app can accelerate the inclusive digitalization of financial record- keeping [1].

As the number of users and the complexity of service requirements increases, PT Jadi Kaya Raya Bersama faces various challenges in its information technology management. Key issues identified include WhatsApp API service disruptions, weaknesses in the user authentication system, the lack of a fallback and monitoring system, and the application's lack of integration with digital financial systems such as e-wallets and banking [2][3]. Furthermore, the company lacks adequate system performance measurements, such as key performance indicators (KPIs) and key risk indicators (KRIs) [4][5].

This organization was chosen as the study object because the review team had direct access as active users and obtained empirical data on the issues encountered in application operations [6][7]. The implementation of technology based on the WhatsApp API for notifications and user interactions, as applied by CatatMak, also represents an important innovation. Studies evaluating the implementation of WhatsApp API notification features in management systems have shown that the use of integrated digital communication channels can enhance the effectiveness of information delivery [6][8]. However, technical challenges such as API service disruptions and authentication system issues require serious attention to ensure service continuity and to support integration with other digital financial systems, such as e-wallets and banking services [9][10].

Based on initial observations and interviews with the CatatMak technical team, several critical issues were identified that impacted system performance. First, the WhatsApp bot's response delay during peak hours indicated a potential bottleneck in message queue processing and capacity limitations in the system integrated with the WhatsApp API. This aligns with findings from research implementing a WhatsApp-based notification system, where timely responses were critical to system effectiveness, although this approach also needs to be explored to address potential delays in real-time message delivery [2][11]. This research highlights the importance of a system architecture capable of supporting high transaction volumes and resource management strategies to prevent delays, particularly during peak usage [12].

Furthermore, reports of increased complaints of login failures also highlight weaknesses in the authentication system [13][14][15]. The absence of token-based authentication or multi- factor authentication (MFA) systems indicates that security aspects in user access management still need to be improved to anticipate the risk of unauthorized access and data leaks [15][16]. Although not explicitly discussed in existing references, literature related to digital security system design recommends implementing more sophisticated authentication mechanisms to provide stronger verification and reduce the potential for attacks and authentication errors [17].

Based on these conditions, systematic analysis and design of IT governance strategies are crucial to ensure that the planning, implementation, and control of IT services align with business objectives. Recent studies have shown that implementing the COBIT 2019 framework provides a comprehensive approach to developing an IT governance strategy because it integrates best practices to improve service reliability, system security, and operational efficiency [18][21]. Furthermore, research in sectors such as smart tourism has identified that COBIT 2019-based IT governance mapping supports alignment between operational needs and an organization's strategic objectives, resulting in a more adaptive and responsive IT management structure to market dynamics [19][20]. Furthermore, a literature review of COBIT 2019 best practices and implementation standards emphasizes that the use of this framework enables organizations to continuously improve, thereby providing added value in supporting the achievement of integrated IT governance effectiveness and optimal business performance [22][23].

The study aims to identify weaknesses in the current IT governance, including API instability, insecure authentication, lack of monitoring and fallback systems, and the absence of integration with digital financial services [24]. Using the COBIT 2019 framework as a reference, this research employs a qualitative descriptive approach through observation and interviews to assess governance gaps and formulate improvement strategies [24][10]. The proposed design includes short- term solutions—such as API monitoring implementation, authentication enhancement, and SLA development—and long- term initiatives like financial system integration, SOP creation, and IT security team formation. Key Performance Indicators (KPI) and Key Risk Indicators (KRI) are also defined to ensure measurable evaluation of IT governance performance. The results are expected to improve system reliability, security, and operational efficiency in supporting the company's digital transformation goals.

METHOD

A. Research Method: Qualitative Descriptive Approach

The descriptive qualitative research approach has been widely used in government and governance studies to obtain a systematic, factual, and accurate picture of the relationships and phenomena that occur. This method allows researchers to gain in-depth understanding through descriptions of processes, policies, and system implementation, as seen in a study discussing the revitalization of the Village Supervisory Agency's performance using a descriptive qualitative approach [6]. Furthermore, research on bureaucratic reform and good governance in the public sector also emphasizes the importance of a descriptive qualitative approach in uncovering system dynamics and interactions between institutions, resulting in comprehensive and relevant findings for the institutional context being studied [7].

In the context of research on IT governance in the CatatMak application, the use of a descriptive qualitative approach is highly appropriate for exploring the implementation of COBIT 2019 as a strategic framework. This method utilizes data obtained from direct observation, in- depth interviews with the technical team, and operational documentation, allowing for detailed identification of gaps, weaknesses, and potential improvements in the system. In line with this, research on IT governance audits in hospitals has implemented COBIT 2019 using qualitative methods to obtain a comprehensive overview of the conditions and challenges faced in information technology management [8]. This approach supports the development of evidence-based IT governance improvement strategies relevant to operational practices in the field.

B. System Flowchart

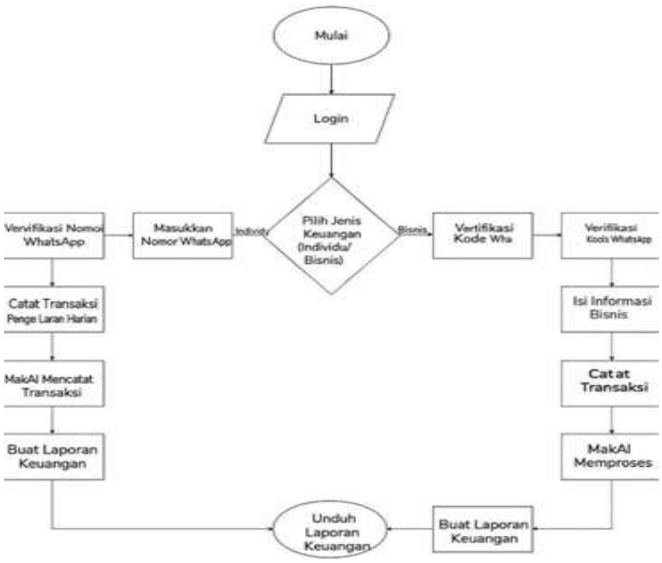

Figure 1. System Flowchart

The flowchart image shows the main workflow of the CatatMak application for recording financial transactions for both individual and business users. The following explains the steps:

- **Start**
  The process begins when the user accesses the CatatMak application through the WhatsApp chatbot interface. This serves as the initial stage of all system operations.
- **Login**
  The user performs a login process to access the system. This stage ensures that only registered and verified users can enter the CatatMak application securely.
- **Selection of Financial Type (Individual / Business)**
  After a successful login, the user is prompted to choose the type of financial record they want to manage — either individual or business. This selection determines the subsequent workflow, as the available features differ based on user needs.
- **Individual Flow – WhatsApp Number Verification**
  For individual users, the system requests WhatsApp number verification. The user inputs their number, and the system sends a verification code to confirm that the number is valid and belongs to the user.
- **Daily Transaction Recording**
  Once verification is successful, the user can begin recording daily financial transactions via WhatsApp messages. The transaction data is then processed and categorized automatically before being stored securely in the cloud database.
- **System Processing (MakAI)**
  The CatatMak system, supported by an automation feature called MakAI, processes and classifies transaction data according to income and expense categories. This step simplifies the creation of financial summaries and reports.
- **Financial Report Generation**
  After the transactions are recorded and processed, the system compiles a financial report that includes a summary of income, expenses, and the final balance. The report can be accessed by the user at any time.
- **Download Financial Report**
  Users can download their financial reports in digital formats such as PDF or Excel directly from the application. This stage represents the output or the final result of the individual process flow.
- **Business Flow – WhatsApp Code Verification**
  For business users, the system requires an additional WhatsApp code verification step as an extra security measure. This ensures that the business account is officially managed and properly authorized.
- **Business Information Input**
  After successful verification, the user is prompted to complete company information such as business name, field of operation, and other relevant details. This data is used to personalize financial report generation for business purposes.
- **Business Transaction Recording and Processing**
  Similar to the individual flow, the system records and processes each business transaction automatically through the chatbot. MakAI classifies the data according to the business transaction categories to support financial tracking.

Business Financial Report Generation and Download Once the business data has been processed, the system generates a detailed business financial report covering all transaction activities, income, and expenses. Users can then download the report for financial evaluation or administrative purposes.

This flowchart illustrates that the CatatMak application has two main paths (individual and business), both of which lead to the automation of recording and generating financial reports. With the integration of WhatsApp and the AI system, the recording process is made faster, easier, and more automated.

C. The COBIT 2019 Framework for IT Governance Design

Recent studies have shown that the use of the COBIT 2019 framework is a comprehensive approach to analyzing and designing information technology governance to align business objectives with strategic IT resource management. For example, Prasetya and Muhammad examined the application of COBIT 2019 in the context of the education sector, emphasizing the integration of quality management principles into IT governance to achieve the organization's strategic objectives [9]. Similarly, Ikhsan et al. conducted a systematic literature review of the implementation of COBIT 2019 in various corporate institutions in Indonesia, revealing that the framework is capable of identifying gaps and recommending improvements in various IT governance domains [10]. This approach supports a deeper understanding of how processes, policies, and risk measures can be effectively integrated to optimize the value of IT investments and support broader business objectives.

Furthermore, the application of COBIT 2019 has also been tested in the context of designing IT governance in the logistics sector, as conducted by Mariatama et al. at PT JWT Global Logistics Indonesia. The study illustrates how identifying the company context, determining the scope of governance, and implementing a structured system design can result in efficient and sustainable IT governance [11]. These findings support the argument that the use of COBIT 2019 is not only relevant in government or educational contexts but also highly applicable in business and corporate environments. This aligns with the study's objective of in- depth review of IT governance implementation in the CatatMak application, where the framework serves as a crucial reference for identifying existing weaknesses and designing evidence-based improvement strategies. COBIT 2019 focuses on five key principles of IT governance:

- Aligning stakeholder needs with organizational objectives.
- Integrating IT governance and management holistically.
- Using a holistic approach to information systems.
- Ensuring clear responsibilities and accountabilities within the organizational structure.
- Optimizing the use of information, technology, and resources.

The application of COBIT 2019 in this study focuses on five main domains: EDM (Evaluate, Direct, and Monitor), APO (Align, Plan, and Organize), BAI (Build, Acquire, and Implement), DSS (Deliver, Service, and Support), and MEA (Monitor, Evaluate, and Assess). Each domain plays a role in building measurable, efficient, and sustainable IT governance [12]. By applying these five domains, this research seeks to create effective, secure, and performance- oriented IT governance that supports PT Jadi Kaya Raya Bersama's MSME financial digitalization strategy

RESULT AND DISCUSSION

A. Overview of Existing IT Governance

The evaluation of IT governance at PT Jadi Kaya Raya Bersama, developer of the CatatMak financial recording application, revealed several key weaknesses within the organization’s technological infrastructure. The system lacked a proper monitoring mechanism for external APIs, resulting in frequent downtime and delayed responses during peak hours. Authentication processes relied solely on conventional login methods without token-based or multi-factor authentication (MFA), exposing users to potential data security threats.

Furthermore, no Service Level Agreement (SLA) or vendor performance management system was established for third-party APIs, which hindered the company’s ability to ensure service reliability. Integration with financial institutions, such as e-wallets and banks, had not yet been implemented. Finally, there were no performance or risk indicators (KPI/KRI) used to assess system efficiency or reliability.

These findings demonstrated that the company's IT governance maturity level was still low, especially in the domains of DSS (Deliver, Service, and Support) and MEA (Monitor, Evaluate, and Assess), indicating a lack of structured control and performance evaluation processes.

B. Gap Analysis Based on COBIT 2019

Implemented The gap analysis was conducted by comparing the current conditions of CatatMak's IT operations with the standards established in the COBIT 2019 framework. The analysis showed high-level gaps across multiple domains:

Table 1. Gap Analysis of CatatMak's IT Governance Based

Area	Present condition	Ideal Standard	Gap Level	Explanation
API Monitoring	There isn't any	Monitoring & auto recovery system	Tall	Frequent downtime and manual handling
Authentication	Normal login	Token-based & MFA	Tall	Vulnerable to security threats
Vendor Management	No SLA	SLA & periodic evaluation	Tall	Cannot control the quality of third party services
Financial Integration	Not available	Connect to bank & e- wallet	Currently	Limiting the expansion of financial services
Performance Evaluation	Not available	KPI/KRI are monitored periodically	Tall	There is no benchmark for IT system performance and risk.

The results emphasize the urgent need for a structured IT governance design aligned with COBIT 2019 to ensure service reliability, security, and continuous improvement.

C. IT Governance Design Using COBIT 2019 Framework

Based on the analysis, an IT governance design was proposed using the COBIT 2019 framework across the following core domains:

1. EDM (Evaluate, Direct, and Monitor)
   - EDM01: Ensures governance framework setting and maintenance.
   - EDM02: Achieves benefits delivery by aligning IT strategy with business objectives.
   - EDM04: Ensures resource optimization and accountability.
   - EDM05: Ensures stakeholder transparency and informed decision-making.
2. APO (Align, Plan, and Organize)
   APO01–APO12: Focus on defining IT management strategies, risk management, resource planning, and establishing governance structures.
3. BAI (Build, Acquire, and Implement)
   - BAI03: Focuses on identifying and building IT solutions aligned with user needs.
   - BAI04: Enables operational readiness and integration with digital financial systems.
4. DSS (Deliver, Service, and Support)
   - DSS03: Implements proactive problem management and fallback mechanisms.
   - DSS05: Strengthens information security management through token-based authentication and MFA.
5. MEA (Monitor, Evaluate, and Assess)
   - MEA01: Monitors performance and conformance through KPI and KRI metrics.

- MEA03: Ensures compliance with internal policies and external regulations.

This governance design ensures that all IT-related activities contribute directly to achieving organizational goals and improving overall service reliability.

D. IT Risk Management and Performance Indicators

First Several potential risks were identified and mapped along with their mitigation strategies. The implementation of Prometheus + AlertManager was proposed to establish proactive monitoring and alerting for API failures. Data protection risks are mitigated through JWT and MFA authentication, while integration risks are addressed through sandbox testing and API standardization. To measure performance, several key indicators were defined:

Table 2. Key Performance Indicators (KPI) for IT Governance Evaluationz

KPI	Target	Objective
Uptime API	≥ 99%	Ensuring service availability
API response time	< 2 seconds	Improve user comfort
Login success rate	≥ 95%	Assessing the reliability of authentication systems
Number of security incidents	0 or minimum	Reducing the risk of data leaks
Recovery time for disruption	< 10 minutes	Efficiency of IT outage handling
Scope of financial services integration	Minimum 1 integration (bank/e-wallet) in 6 months	Increase the added value of the application

These metrics serve as the foundation for evaluating the success of IT governance implementation and ensuring continuous service improvement.

E. Implementation Roadmap

A 24-month roadmap was established to guide implementation, divided into short-term (0–6 months) and long-term (6–24 months) actions. Short-term priorities include system monitoring setup, authentication enhancement, SLA formulation, and KPI/KRI implementation. Long-term initiatives focus on financial system integration, development of internal IT policies based on COBIT 2019, staff training, dashboard visualization, and formation of a dedicated IT security team.

Table 3. IT Governance Implementation Roadmap

Phase	Activity	Execution time	Person responsible	Information
Phase 1	Implementation API monitoring & fallback system (Prometheus + AlertManager)	Month 1–2	DevOps Team	Reduce downtime and increase service reliability
Phase 2	Authentication system improvements (JWT and MFA) for admins	Month 2–3	Backend Developer Team	Increase security access system
Phase 3	Drafting and negotiating SLAs with API vendors	Month 3–4	Management & Legal Team	Provides control over the quality of third party services

Phase	Activity	Execution time	Person responsible	Information
Phase 4	Determination and implementation of KPI and KRI	Months 4–5	IT Management Team	As base evaluation performance IT systems
Phase 5	Integration with system digital finance (Midtrans/ Xendit)	Months 6–12	Integration Team	Expand features and values plus application CatatMak
Phase 6	Development of SOPs and internal policies based on COBIT 2019	Months 10–16	IT and HR Team	The foundation of sustainable IT governance
Phase 7	Internal training and socialization of IT policies	Months 14–18	IT & Training Team	Improve internal competency and staff compliance
Phase 8	Evaluation dashboard development performance (Power BI/Metabase)	Month 18–22	Data Analyst Team	Real-time visualization of KPI & KRI
Phase 9	Establishing an internal IT Security Team	Month 22–24	Management	For supervision risk and periodic audits

This phased approach ensures gradual yet sustainable improvement in IT governance maturity and operational performance.

F. Summary of Results

The application of the COBIT 2019 framework to CatatMak has produced a structured roadmap for IT governance improvement. The framework effectively identifies weaknesses, aligns IT operations with business goals, and establishes measurable performance indicators. The result is a comprehensive governance design that enhances service availability, data security, operational efficiency, and user satisfaction. Overall, the findings demonstrate that the adoption of COBIT 2019 provides a practical and strategic foundation for improving IT governance maturity in financial technology startups like PT Jadi Kaya Raya Bersaa

CONCLUTIONS

This study successfully analyzed and designed an enhanced Information Technology (IT) governance model for the CatatMak financial recording application using the COBIT 2019 framework. The findings revealed several critical weaknesses within the organization's IT operations, including the absence of API monitoring mechanisms, lack of secure authentication systems, unstructured vendor management without Service Level Agreements (SLA), limited integration with financial systems, and the absence of performance and risk measurement indicators (KPI/KRI).

Through the implementation of COBIT 2019, a structured governance model was developed to address these weaknesses. The proposed framework introduces short-term initiatives—such as API monitoring and fallback systems using Prometheus and AlertManager, secure authentication via JWT and MFA, and the establishment of SLA and KPI/KRI mechanisms—and long-term strategies involving financial system integration, policy and SOP development, IT performance dashboards, and the formation of an internal IT security team.

The proposed roadmap not only improves the organization's operational efficiency and data security but also aligns IT activities with business objectives, ensuring continuous service improvement. By adopting the COBIT 2019 principles, PT Jadi Kaya Raya Bersama can strengthen IT governance maturity, enhance service reliability, and support sustainable digital transformation for MSME empowerment through secure, integrated, and adaptive financial technology solutions

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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