WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Evaluation of Hospital Information System (SIMRS) IT Governance Using the COBIT 5 Framework: A Case Study of AMC Hospital, Bandung Regency

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A B S T R A C T

AMC Hospital has implemented a Hospital Information System (SIMRS) to support its business processes and improve service efficiency, particularly in line with the National Health Insurance (JKN/KIS) program. However, compliance with Ministry of Health Regulation No. 24/2022 on electronic medical records has not yet been achieved, partly due to the absence of a formal evaluation of IT/SIMRS governance. This study applies a descriptive qualitative method using the COBIT 5 Framework through interviews, capability assessments, and Focus Group Discussions (FGD). The evaluation identified two critical domains—EDM02 (Ensure Benefits Delivery) and APO01 (Manage the IT Management Framework), both at capability level 2, below the expected maturity. Root Cause Analysis (RCA) further highlighted inefficiencies in the patient discharge process, particularly related to drug returns. Improvement strategies were proposed, including revising SOPs, strengthening IT governance, and enhancing SIMRS functionalities, with a targeted capability increase to level 3. These measures are expected to optimize SIMRS governance and improve hospital service delivery.

Keywords: Evaluation of IT/SIMRS Governance, COBIT 5 Mapping Process, RCA.

Introduction

AMC Hospital is a healthcare service provider that has consistently integrated information technology into its operational framework to enhance service quality and efficiency. Established in 2005 under PT. Annisa Eka Utama and located in Cileunyi, Kabupaten Bandung, West Java, AMC Hospital was founded with the vision "to become a nationally recognized hospital with professional and comprehensive healthcare services." To realize this vision, AMC Hospital has formulated a series of strategic programs, among which the development and implementation of a Hospital Management Information System (SIMRS) occupies a central role. An integrated and well-managed SIMRS is essential not only for supporting clinical and administrative processes but also for ensuring compliance with national healthcare policies, including the mandatory use of electronic medical records stipulated in Ministry of Health Regulation No. 24/2022.

The quality of hospital services is closely linked to the reliability and governance of SIMRS (Farlinda et al., 2019). Effective IT governance ensures that the hospital's technology infrastructure and information systems are aligned with organizational objectives, delivering value to stakeholders while minimizing risks. As Van Grembergen & De Haes (2009) highlight, IT governance success is measured by its ability to create tangible business value through the management of challenges and solutions in complex organizations. Similarly, ISACA (2011) stresses that COBIT 5 provides a comprehensive and standardized framework for IT governance and management, enabling institutions to achieve strategic objectives and maximize the return on IT investments. For hospitals, where accurate data, timeliness, and operational reliability are paramount, such governance frameworks become indispensable.

The importance of SIMRS effectiveness has been confirmed in various empirical studies. Williams et al. (2016) emphasized that the stability and reliability of health information systems significantly enhance operational efficiency and accuracy. Conversely, Lumingkewas et al. (2023) noted that SIMRS malfunctions may lead to extended patient waiting times, administrative errors, and declining service quality, issues that can have a direct impact on patient satisfaction and hospital reputation. Aghazadeh et al. (2013) further reinforced this by demonstrating that a well-functioning SIMRS improves service quality, whereas poorly managed systems create inefficiencies and disrupt essential healthcare delivery. These findings underscore the critical role of robust IT governance in ensuring that hospitals can consistently deliver reliable and patient-centered services.

In this context, evaluating IT governance in AMC Hospital through the COBIT 5 framework becomes a strategic necessity. COBIT 5 not only serves as a guideline but also integrates internationally recognized best practices, combining governance and management elements into a unified structure. Melaku (2023) argue that COBIT 5 enables organizations to establish effective control mechanisms while proactively identifying weaknesses within their IT systems. For AMC Hospital, adopting COBIT 5 as an evaluation tool provides an opportunity to systematically assess the current maturity level of SIMRS

governance, identify gaps in procedures, human resources, and technology utilization, and design structured improvement strategies that align with both operational needs and long-term strategic objectives.

Ultimately, the evaluation of SIMRS governance at AMC Hospital using COBIT 5 is expected to produce actionable insights that enhance efficiency, accountability, and service reliability. By implementing governance improvements based on internationally accepted standards, the hospital can strengthen its capacity to provide professional, comprehensive, and patient-focused healthcare services, while simultaneously ensuring compliance with regulatory requirements and preparing for future challenges in digital healthcare transformation.

Method

This study employed a descriptive qualitative approach with the research object being the Hospital Management Information System (SIMRS) at AMC Hospital, while the research subjects included policymakers, IT staff, and direct end-users of SIMRS such as nurses, medical record officers, pharmacy staff, financial staff, laboratory staff, and radiology staff. Data collection was carried out through in-depth interviews, Focus Group Discussions (FGD), direct observation, questionnaires, and document reviews, including SIMRS Standard Operating Procedures (SOPs), unit reports, and the COBIT 5 manual. Informants were selected using purposive sampling, consisting of ten individuals who have authority or direct involvement in the implementation of SIMRS. Data analysis followed the COBIT 5 framework, beginning with the mapping of governance domains (EDM) and management domains (APO, BAI, DSS, MEA), and continued with capability level measurement using the Process Assessment Model (PAM). To identify the root causes of problems, Root Cause Analysis (RCA) was applied, supported by a fishbone diagram, and further discussed during FGDs. The results of domain mapping and gap analysis served as the basis for formulating realistic and measurable improvement strategies for SIMRS governance, aiming to enhance the capability level of AMC Hospital's IT governance in a sustainable manner.

Results and Discussion

The governance of information technology (IT) within the Hospital Management Information System (SIMRS) at AMC Hospital has reached a functional level of implementation; however, it remains far from optimal in ensuring the hospital's effectiveness in delivering high-quality healthcare services. While the IT unit has established formal organizational guidelines, detailed job descriptions, and a clearly defined structural framework, practical limitations continue to hinder full implementation. The most pressing challenges include a shortage of qualified human resources, uneven distribution of IT responsibilities, and limited comprehension among end-users regarding the procedures embedded within SIMRS. These conditions undermine the consistency and reliability of IT governance, resulting in frequent deviations from designated job roles and organizational structures. Consequently, operational inefficiencies persist, including prolonged inpatient discharge times, delays in the management of medication returns, and the suboptimal utilization of SIMRS features across multiple hospital service units.

These issues highlight a misalignment between established governance structures and their practical execution, a common challenge in healthcare institutions adopting digital health solutions. According to Setiawan et al. (2020), underperformance in SIMRS implementation frequently translates into inefficiencies in patient flow, heightened administrative burden, and reduced operational accuracy. Similarly, Farlinda et al. (2019) emphasize that weak SIMRS governance often exacerbates bottlenecks in service delivery, contributing to increased patient waiting times and diminished service quality. In a broader context, Saputra & Muhimmah (2013) demonstrate that well-functioning hospital information systems significantly enhance care quality by improving data accuracy and reducing inefficiencies, underscoring the risks associated with poor IT governance.

The difficulties faced by AMC Hospital also reflect global concerns about IT governance in healthcare, where the rapid adoption of digital systems is not always matched by adequate governance frameworks or human resource capacity (Alismaili et al., 2022). World Health Organization (2021) further argues that governance maturity is not only a matter of having policies and structures in place but also ensuring their consistent execution, monitoring, and adaptation to organizational needs. The mismatch between policy and practice in AMC Hospital therefore indicates a partial implementation of governance, where formal structures exist but are insufficiently enforced and inadequately supported by training, monitoring, and evaluation mechanisms. Without addressing these gaps, the hospital risks underutilizing its investments in SIMRS and failing to deliver on its vision of efficient, patient-centered healthcare.

Mapping of IT governance practices using the COBIT 5 Framework revealed that the central challenges within AMC Hospital are concentrated in two critical domains, namely EDM02 (Ensure Benefits Delivery) and APO01 (Manage the IT Management Framework). Within EDM02, the anticipated benefits of digital transformation through SIMRS have not been fully actualized. This is particularly evident in service efficiency indicators, such as prolonged inpatient discharge times, which suggest that the strategic objectives of digitalization are not being translated into measurable performance improvements. The gap between intended outcomes and realized benefits reflects a recurring issue in healthcare digitalization, where the alignment between technological initiatives and operational efficiency remains weak (Archangel et al., 2007). In parallel, the APO01 domain highlights inconsistencies in the management framework for IT governance. Tasks are frequently performed outside of designated job descriptions, and essential Standard Operating Procedures (SOPs), such as those governing post-maintenance monitoring and evaluation, are either incomplete or entirely absent. These conditions reflect structural weaknesses in operationalizing governance policies, thereby creating vulnerabilities in accountability and sustainability. As Yen et al. (2017) emphasize, the essence of effective IT governance lies in the ability to transform strategic alignment into operational coherence, a challenge that is often exacerbated in healthcare organizations operating with limited resources and high system complexity.

The capability evaluation conducted through the COBIT 5 assessment further confirmed that AMC Hospital's SIMRS currently operates at Level 2 (Partially Achieved) across several process attributes within both EDM02 and APO01. This level indicates that governance practices are present but remain fragmented, inconsistently implemented, and inadequately documented. In contrast, the desired benchmark for AMC Hospital is Level 3 (Largely Achieved), which is characterized by standardized, documented, and consistently applied processes across all organizational units. The gap between Level 2 and Level 3 is not merely incremental but rather represents a critical transition from partial compliance to a structured and integrated governance framework. According to ISACA (2011), achieving Level 3 capability is a prerequisite for embedding IT governance into organizational culture, as it ensures that policies and procedures are systematically applied and monitored. Reaching this level is also vital for ensuring accountability, strengthening risk management, and sustaining IT-enabled healthcare services in the long term. Similar conclusions have been drawn by Melaku (2023), who argue that maturity in IT governance provides not only structural stability but also the foundation for continuous improvement and innovation in service delivery.

A detailed gap analysis identified three principal areas of weakness within AMC Hospital's SIMRS governance: procedural inadequacies, workforce limitations, and the underutilization of available technological functionalities. From a procedural standpoint, the absence of comprehensive and standardized Standard Operating Procedures (SOPs) has led to operational inconsistencies. This gap is particularly evident in critical processes such as inpatient discharge, post-maintenance monitoring, and medication return management, where the lack of formalized guidelines results in inefficiencies and variable practices across units. The procedural shortfall underscores the need for hospitals to establish clear governance instruments that ensure consistency, accountability, and alignment with strategic objectives (Alasiri & Mohammed, 2022).

Human resource constraints further exacerbate governance challenges. The IT department at AMC Hospital operates with limited staffing, which forces existing personnel to undertake responsibilities outside their formal job descriptions. This not only increases the risk of burnout and error but also undermines the overall efficiency of IT operations. According to Dehghani et al. (2021), shortages of qualified personnel in healthcare IT governance frequently hinder the effective integration of digital systems, as the workload imbalance prevents staff from focusing on their core functions. In the case of AMC Hospital, the lack of adequate staffing has created bottlenecks in system maintenance and user support, both of which are essential for sustaining high-quality SIMRS performance.

From the technological dimension, the underutilization of SIMRS features represents a missed opportunity to optimize service delivery. Critical modules such as electronic prescriptions and automated medication return functions have either not been fully implemented or are inconsistently applied across departments. As a result, processes that could be streamlined through system automation continue to rely heavily on manual intervention, leading to delays and administrative inefficiencies. This aligns with the findings of Ana et al. (2023), who emphasize that many SIMRS inefficiencies stem from a misalignment between available technological capabilities, organizational procedures, and workforce readiness. Similarly, Iadanza & Luschi (2020) note that incomplete or inconsistent adoption of digital health tools often diminishes their intended impact on service quality and patient safety.

Collectively, these gaps demonstrate that while AMC Hospital has established a foundational SIMRS structure, the absence of procedural rigor, insufficient staffing, and suboptimal system utilization prevent the hospital from achieving the full benefits of its digital investments. Addressing these deficiencies requires an integrated approach that strengthens procedural frameworks, enhances human resource capacity, and ensures systematic deployment of available SIMRS functionalities. Such an approach would not only improve efficiency and accuracy but also bring AMC Hospital closer to realizing the strategic objectives of its digital transformation agenda.

In order to close these governance gaps, AMC Hospital must adopt a multi-dimensional improvement strategy. First, governance strengthening must focus on the revision and development of SOPs that are contextually relevant to operational needs. SOPs for inpatient discharge, prioritization of discharge during physician rounds, IT inventory management, and post-repair monitoring should be formalized and institutionalized. Second, workforce capacity must be enhanced through both the recruitment of additional IT personnel and structured training programs for existing staff. This would address the dual challenges of limited staffing and inadequate technical knowledge, ensuring that tasks are performed within the scope of formal responsibilities. Third, technological improvements must be pursued through the development and optimization of SIMRS features, including the implementation of electronic prescriptions, integration of digital return medication processes, and systematic monitoring mechanisms. These recommendations align with Chen et al. (2023), who argue that the combination of procedural clarity, skilled human resources, and advanced technological features constitutes the foundation of an effective hospital information system.

To operationalize these strategies, AMC Hospital should undertake a comprehensive reassessment of its organizational structure, job descriptions, and SIMRS workflows to ensure better alignment between unit capacities, system functionalities, and strategic objectives. Such a reassessment must not be limited to structural review alone but should also incorporate mechanisms for continuous feedback and process refinement. Periodic evaluations are therefore critical, as they enable the hospital to measure performance outcomes while also identifying emerging governance gaps that may arise as technology and organizational needs evolve. As Sabermahani et al. (2021) argue, governance effectiveness requires ongoing oversight and adaptation, particularly in dynamic environments such as healthcare, where the integration of IT directly impacts service quality and patient outcomes.

In strengthening its evaluation framework, AMC Hospital should expand the scope of COBIT 5 assessment beyond the currently emphasized EDM02 (Ensure Benefits Delivery) and APO01 (Manage the IT Management Framework). While these domains capture key issues of benefit realization and structural alignment, they do not fully reflect the operational challenges inherent in hospital information systems. Incorporating additional domains such as DSS (Deliver, Service, and Support) and MEA (Monitor, Evaluate, and Assess) would provide a more holistic view of governance maturity, as these domains directly address service delivery, technical support, and oversight mechanisms. A comprehensive evaluation approach will not only highlight procedural weaknesses but also illuminate how SIMRS contributes to broader organizational performance.

Furthermore, the institutionalization of regular capability assessments is crucial. Annual evaluations should be formalized to track progress against established benchmarks and ensure that governance maturity is advancing toward the targeted level. The involvement of external evaluators can enhance objectivity and credibility, as independent perspectives help mitigate biases that may arise in internal reviews. This is consistent with the guidance of ISACA (2011), which highlights the value of third-party validation in IT governance maturity assessments.

To ensure that improvement efforts are concrete and measurable, AMC Hospital must design structured action plans underpinned by clearly defined Key Performance Indicators (KPIs). For example, staffing benchmarks should be established to guide the incremental expansion of the IT workforce, while competency targets can inform the design of continuous training programs tailored to address both technical and procedural gaps. Such measurable indicators will ensure that improvement strategies are not merely aspirational but are operationalized in a manner that is both achievable and sustainable. This aligns with the recommendations of Kwon et al. (2021), who emphasize the necessity of linking IT governance practices with quantifiable business value outcomes.

Ultimately, the success of these strategies depends on the adoption of an integrated and patient-centered approach to IT governance. Improvements in SIMRS cannot be treated as purely technical interventions but must reflect the hospital's broader mission of delivering high-quality, professional, and comprehensive healthcare services. The involvement of all stakeholders, including medical staff, IT personnel, management, and SIMRS vendors, is indispensable for ensuring that governance enhancements are holistic. By embedding governance practices into daily operations and aligning them with the hospital's strategic objectives, AMC Hospital can enhance both accountability and performance across its service spectrum.

In conclusion, the evaluation of SIMRS governance at AMC Hospital demonstrates that while foundational structures are in place, significant gaps persist in procedural execution, workforce capacity, and system utilization. The adoption of COBIT 5 as an evaluation framework provides a systematic pathway for identifying weaknesses, mapping maturity levels, and designing targeted interventions. By implementing integrated strategies that encompass organizational, human, and technological dimensions, AMC Hospital can advance its IT governance maturity, optimize SIMRS functionality, and ultimately elevate the quality and efficiency of its healthcare delivery.

Conclusion

The evaluation of SIMRS governance at AMC Hospital shows that while the system has been implemented and provides a foundational framework for supporting hospital operations, it has not yet reached an optimal level in terms of efficiency and effectiveness. The mapping of COBIT 5 domains revealed that challenges in ensuring timely patient discharge, managing IT workloads, and underutilizing digital features are closely tied to weaknesses in EDM02 (Ensure Benefits Delivery) and APO01 (Manage the IT Management Framework). Current governance practices remain at capability level 2, where processes are only partially applied and inconsistently documented, creating a gap toward the desired level 3, which emphasizes standardized and consistent practices across all units. The gap is largely driven by procedural shortcomings, limited IT human resources, and underdeveloped technological integration. To bridge this, AMC Hospital must strengthen governance by revising and expanding SOPs, improving IT staffing and competencies, and enhancing SIMRS functionalities such as e-prescriptions and automated drug returns. Moreover, periodic capability assessments and broader consideration of other COBIT 5 domains, including DSS and MEA, are essential to ensure sustainable improvements. Through these measures, AMC Hospital can progressively elevate its IT governance maturity, align SIMRS more closely with business and clinical needs, and ultimately deliver better service outcomes to patients and stakeholders.

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