Evaluation of COBIT 2019-Based Information Technology Governance to Improve the Effectiveness of the Patient Queue Management System

Natalia Hernawaty Nahampun, Muhammad Amin

Abstract

Effective patient queue management systems play a crucial role in improving healthcare service quality, reducing waiting times, and enhancing patient satisfaction. However, the successful implementation of such systems depends significantly on the effectiveness of information technology (IT) governance practices within healthcare organizations. This study aims to evaluate IT governance in a patient queue management system using the COBIT 2019 framework and to identify improvement strategies that support organizational objectives and service efficiency. The research employs a quantitative descriptive approach by assessing selected COBIT 2019 governance and management objectives relevant to service operations, risk management, performance monitoring, and resource optimization. Data were collected through interviews, observations, documentation reviews, and questionnaires distributed to stakeholders involved in managing and operating the patient queue management system. The capability level of each process was measured and compared with the expected target level to determine governance gaps. The results indicate that several governance processes have achieved a moderate level of capability, demonstrating that the system is generally functioning effectively. However, gaps remain in areas related to performance evaluation, risk management, and continuous improvement. The gap analysis revealed that the average capability level of the evaluated processes is below the desired organizational target, indicating the need for governance enhancements. Based on the findings, recommendations are proposed, including the establishment of structured performance monitoring mechanisms, periodic risk assessments, improved documentation practices, and strengthened stakeholder involvement in governance activities. The implementation of these recommendations is expected to improve the effectiveness, reliability, and sustainability of the patient queue management system while supporting better healthcare service delivery. This study contributes to the growing body of knowledge on IT governance assessment in healthcare institutions through the application of the COBIT 2019 framework.

Keywords: *COBIT 2019; Information Technology Governance; Patient Queue Management System; Capability Level Assessment; Healthcare Services*

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Introduction

The rapid advancement of information technology has significantly transformed healthcare services, enabling organizations to improve operational efficiency, service quality, and patient satisfaction. One of the critical areas affected by technological innovation is patient queue management. Healthcare institutions increasingly rely on patient queue management systems to streamline registration processes, reduce waiting times, and optimize resource utilization. These systems support healthcare providers in delivering timely services while enhancing the overall patient experience. However, the effectiveness of such systems depends not only on technological capabilities but also on the quality of information technology (IT) governance implemented within the organization [1] [2] [3].

Effective IT governance ensures that information technology resources are aligned with organizational objectives, risks are appropriately managed, and service performance is continuously monitored and improved. In healthcare environments, poor governance practices may result in system inefficiencies, service interruptions, data inaccuracies, and reduced patient satisfaction. Consequently, healthcare organizations must establish robust governance mechanisms to ensure that IT investments generate maximum value and contribute positively to healthcare service delivery. The evaluation of IT governance has therefore become an essential activity in maintaining the effectiveness and sustainability of healthcare information systems [4][5][6].

The COBIT 2019 framework is one of the most widely recognized standards for evaluating and improving IT governance and management practices. Developed by the ISACA, COBIT 2019 provides comprehensive guidance for aligning IT processes with organizational goals while addressing governance, risk management, performance measurement, and resource optimization. The framework introduces governance and management objectives that enable organizations to assess their current capabilities, identify performance gaps, and develop strategies for continuous improvement. Due to its flexibility and comprehensive structure, COBIT 2019 has been widely adopted across various sectors, including healthcare [7] [8][9].

Despite the increasing adoption of patient queue management systems, many healthcare organizations continue to face challenges related to governance effectiveness. Issues such as inadequate performance monitoring, insufficient risk management practices, and limited stakeholder involvement can hinder the achievement of desired service outcomes. Furthermore, the absence of systematic governance assessments may prevent organizations from identifying weaknesses and implementing appropriate corrective actions. Therefore, evaluating IT governance using a structured framework is essential to ensure that patient queue management systems operate efficiently and effectively [10], [11].

This study aims to evaluate the implementation of information technology governance in a patient queue management system using the COBIT 2019 framework. The assessment focuses on measuring the capability levels of selected governance and management processes, identifying gaps between current and expected performance, and proposing recommendations for improvement. The findings of this study are expected to provide valuable insights for healthcare organizations seeking to enhance the effectiveness, reliability, and sustainability of their patient queue management systems while supporting the delivery of high-quality healthcare services [12].

Literature Review

Information Technology (IT) governance refers to the framework of structures, processes, and mechanisms that ensure information technology supports and extends organizational strategies and objectives. Effective IT governance enables organizations to maximize the value of IT investments, manage risks, optimize resources, and improve organizational performance. In healthcare institutions, IT governance plays a crucial role in ensuring that information

systems operate efficiently, securely, and reliably to support patient care and administrative processes. The increasing dependence on digital technologies in healthcare has made governance assessment an essential practice for maintaining service quality and organizational effectiveness [13], [14].

COBIT 2019 is a globally recognized framework developed to assist organizations in governing and managing information technology. The framework provides a comprehensive set of governance and management objectives that align IT activities with business goals while addressing performance measurement, risk management, resource optimization, and stakeholder value creation. COBIT 2019 introduces a capability-based assessment approach that enables organizations to evaluate the maturity and effectiveness of their IT processes. Through gap analysis, organizations can identify weaknesses in governance implementation and establish improvement strategies to achieve desired performance targets [15].

Patient Queue Management Systems are information systems designed to manage patient flow, reduce waiting times, and improve service efficiency within healthcare facilities. These systems facilitate patient registration, queue monitoring, appointment scheduling, and service allocation, thereby enhancing operational effectiveness and patient satisfaction. Previous studies have shown that the successful implementation of queue management systems depends not only on technological infrastructure but also on effective governance practices that ensure system reliability, continuous monitoring, and alignment with organizational objectives. Therefore, evaluating the governance of patient queue management systems using the COBIT 2019 framework is important for identifying improvement opportunities and supporting highquality healthcare service delivery [15] [16].

Research Methodology

This study applies a quantitative descriptive research approach to evaluate the implementation of Information Technology (IT) governance in the Patient Queue Management System using the COBIT 2019 framework. The purpose of this methodology is to determine the current capability level of governance processes, identify governance gaps, and formulate recommendations that can improve the effectiveness of the system. The COBIT 2019 framework was selected because it provides comprehensive guidance for evaluating governance and management processes while ensuring alignment between information technology and organizational objectives.

The research was conducted through a structured and systematic process involving data collection, governance assessment, capability level measurement, and recommendation development. Data were obtained from stakeholders involved in the operation and management of the Patient Queue Management System, including management personnel, IT staff, and system users. Multiple data collection techniques, such as interviews, observations, questionnaires, and documentation reviews, were employed to ensure the validity and reliability of the findings. The methodology consists of six main stages, as illustrated in the research flow. The research process was carried out through the following stages:



Figure 1. Research Methodology

1. Problem Identification

The first stage involved identifying the existing problems and challenges associated with the implementation and governance of the Patient Queue Management System. This activity was carried out through preliminary observations and discussions with relevant stakeholders to gain an understanding of the current operational conditions of the system. Particular attention was given to issues related to service efficiency, waiting times, system reliability, governance practices, and alignment between information technology and organizational objectives.

The problem identification stage also aimed to determine the scope of the research and define the main objectives of the study. By understanding the organizational context and identifying key governance concerns, the researcher was able to establish a clear direction for the evaluation process. The findings from this stage served as the foundation for subsequent research activities and ensured that the assessment addressed relevant organizational needs.

2. Literature Review

The literature review stage was conducted to establish a strong theoretical foundation for the study. Various sources, including scientific journals, conference proceedings, books, and official COBIT 2019 publications, were examined to gain a comprehensive understanding of IT governance concepts, capability assessment methods, healthcare information systems, and patient queue management systems.

This stage also involved reviewing previous studies related to the implementation of COBIT frameworks in healthcare organizations and other sectors. The purpose was to identify commonly used assessment approaches, governance challenges, and best practices for improving IT governance performance. The knowledge obtained from the literature review provided valuable guidance for selecting assessment criteria, interpreting results, and formulating recommendations.

3. Data Collection

The data collection stage aimed to gather information required for evaluating the implementation of IT governance within the Patient Queue Management System. Multiple data collection techniques were employed to ensure the completeness and accuracy of the information obtained.

Interviews were conducted with management personnel, IT staff, and system operators to understand governance practices, organizational policies, and operational procedures. Direct observations were performed to examine how the system functions in supporting patient service activities. Documentation reviews were carried out to analyze policies, reports, standard operating procedures, and other relevant records related to system governance and management. In addition, questionnaires were distributed to respondents involved in the system's operation and management to collect quantitative data for capability level assessment. The use of multiple data collection methods enabled data triangulation, thereby increasing the validity and reliability of the research findings.

4. COBIT 2019 Assessment

The fourth stage focused on evaluating IT governance processes using the COBIT 2019 framework. Relevant governance and management objectives were selected based on organizational needs and the characteristics of the Patient Queue Management System. The selected processes represented governance areas that significantly influence system effectiveness, service quality, performance monitoring, risk management, and resource utilization.

The assessment was conducted by mapping the collected data to the selected COBIT 2019 processes and evaluating the extent to which governance practices were implemented within the organization. This stage provided a structured mechanism for measuring governance performance and determining whether existing practices were aligned with organizational goals and stakeholder expectations.

5. Gap Analysis

After the capability levels of the selected COBIT 2019 processes were determined, a gap analysis was conducted to compare the current capability levels with the target capability levels established by the organization. This analysis aimed to identify discrepancies between the existing governance condition and the desired future state.

The results of the gap analysis provided valuable insights into areas requiring improvement. Governance processes with significant gaps indicated weaknesses that could potentially affect the effectiveness of the Patient Queue Management System. By identifying these gaps, the

organization could prioritize corrective actions and allocate resources more efficiently to address governance deficiencies.

6. Improvement Recommendations

The final stage involved developing recommendations based on the results of the COBIT 2019 assessment and gap analysis. The recommendations were designed to address identified weaknesses and support the achievement of the target capability levels. Improvement initiatives focused on strengthening governance structures, enhancing performance monitoring mechanisms, improving risk management practices, optimizing resource utilization, and increasing stakeholder involvement in governance activities.

The proposed recommendations provide practical guidance for improving the effectiveness, reliability, and sustainability of the Patient Queue Management System. Furthermore, they support the organization's efforts to achieve better alignment between information technology and healthcare service objectives. The implementation of these recommendations is expected to contribute to improved operational performance, reduced service delays, and enhanced patient satisfaction.

Results

The evaluation of Information Technology (IT) governance in the Patient Queue Management System was conducted using the COBIT 2019 framework. The assessment aimed to determine the current capability level of selected governance and management processes and identify areas requiring improvement. Data were collected through questionnaires, interviews, observations, and documentation reviews involving stakeholders responsible for operating and managing the system.

The selected COBIT 2019 processes were chosen based on their relevance to the effectiveness of the Patient Queue Management System, particularly in the areas of governance oversight, risk management, service delivery, and performance monitoring. The results provide insights into the current state of IT governance implementation and serve as the basis for identifying governance gaps and developing improvement recommendations.

Table 1. Questionnaire Distribution Based on COBIT 2019 Domains

No	COBIT 2019 Domain	Domain Description	Number of Respondents
1	EDM03	Ensured Risk Optimization	5
2	APO07	Managed Human Resources	5
3	APO12	Managed Risk	5
4	APO13	Managed Security	5
5	BAI03	Managed Solutions Identification and Build	5
6	DSS01	Managed Operations	5
7	DSS02	Managed Service Requests and Incidents	5
8	MEA01	Managed Performance and Conformance Monitoring	5
Total	**8 Domains**		**40**

Table 1 presents the COBIT 2019 domains selected for evaluating the Patient Queue Management System. The selected domains represent governance and management processes associated with risk management, security, operational services, incident handling, performance monitoring, and human resource management. A total of 40 questionnaire responses were obtained from stakeholders involved in the operation, administration, and management of the

system. The selected domains were considered relevant because they directly influence service quality, patient waiting time, system reliability, and overall organizational performance.

Table 2. Capability Level Assessment Results

COBIT 2019 Domain	Current Capability Level	Target Capability Level	Gap
EDM03	3.40	4.00	0.60
APO07	3.10	4.00	0.90
APO12	3.20	4.00	0.80
APO13	3.50	4.00	0.50
BAI03	3.30	4.00	0.70
DSS01	3.60	4.00	0.40
DSS02	3.40	4.00	0.60
MEA01	3.00	4.00	1.00
Average	**3.31**	**4.00**	**0.69**

Table 2 shows the capability level assessment results for each selected COBIT 2019 domain. The analysis indicates that the average capability level achieved by the organization is 3.31, which corresponds to a well-defined and established process level. This result demonstrates that governance activities related to the Patient Queue Management System have been implemented and documented; however, some processes still require improvements to achieve predictable and measurable performance.

Among the evaluated domains, DSS01 achieved the highest capability level of 3.60, indicating that operational activities supporting the patient queue management process are managed effectively. APO13 also demonstrated a relatively high score of 3.50, reflecting the organization's commitment to information security practices. In contrast, MEA01 obtained the lowest capability level of 3.00, indicating weaknesses in performance monitoring and compliance evaluation. These findings suggest that although the system operates effectively, governance processes related to monitoring and continuous improvement require greater attention.

Table 3. Gap Analysis and Improvement Priorities

COBIT 2019 Domain	Gap Value	Priority Level	Recommended Action
MEA01	1.00	High	Strengthen performance monitoring and KPI evaluation
APO07	0.90	High	Improve staff competency and training programs
APO12	0.80	High	Enhance risk identification and mitigation processes
BAI03	0.70	Medium	Improve system development and documentation procedures
EDM03	0.60	Medium	Strengthen governance oversight and risk optimization
DSS02	0.60	Medium	Improve incident response and service request management
APO13	0.50	Medium	Enhance security monitoring and access control
DSS01	0.40	Low	Maintain operational management effectiveness
Average Gap	**0.69**	**Medium**	Continuous Governance Improvement

Table 3 presents the gap analysis results and the corresponding improvement priorities. The largest gap was identified in MEA01 with a value of 1.00, indicating that performance measurement and governance monitoring processes require immediate improvement. The lack of structured evaluation mechanisms may reduce the organization's ability to identify operational inefficiencies and governance weaknesses in a timely manner.

APO07 and APO12 also exhibit significant gaps, suggesting that human resource development and risk management practices should be prioritized. Adequate staff competencies and effective risk management are essential for ensuring the sustainability and reliability of the Patient Queue Management System. Meanwhile, DSS01 shows the smallest gap value, indicating that operational management practices are relatively mature and effective.

Overall, the average gap value of 0.69 demonstrates that the organization has implemented IT governance practices at a satisfactory level; however, several processes still need improvement to achieve the target capability level. Addressing these gaps through structured governance initiatives is expected to enhance system effectiveness, reduce patient waiting times, improve service quality, and increase stakeholder satisfaction.

Discussion

The assessment results indicate that the Patient Queue Management System has achieved an average capability level of 3.31, demonstrating that governance processes have been formally established and implemented within the organization. This capability level shows that the system effectively supports patient service operations and contributes to improved healthcare service delivery.

However, the gap analysis reveals that several domains, particularly MEA01, APO07, and APO12, have not yet reached the target capability level. These findings suggest the need for improvements in performance monitoring, human resource development, and risk management practices to enhance governance effectiveness.

By implementing the proposed recommendations, the organization can reduce governance gaps and improve the reliability of the Patient Queue Management System. Improved governance practices are expected to increase operational efficiency, service quality, and patient satisfaction while supporting organizational objectives.

Conclusion

This study evaluated the implementation of Information Technology (IT) governance in the Patient Queue Management System using the COBIT 2019 framework. The assessment focused on selected governance and management objectives related to operational management, risk management, security, human resources, and performance monitoring. The results revealed that the organization achieved an average capability level of 3.31, indicating that governance processes have been formally established, documented, and implemented to support the operation of the patient queue management system.Despite these positive results, the gap analysis identified several areas that require further improvement to achieve the target capability level of 4. The largest gaps were found in the domains of performance monitoring (MEA01), human resource management (APO07), and risk management (APO12). These findings suggest that stronger monitoring mechanisms, continuous staff development programs, and more structured risk management practices are needed to improve governance effectiveness.Overall, the study demonstrates that COBIT 2019 provides an effective framework for assessing IT governance in healthcare information systems. The implementation of the proposed recommendations is expected to enhance system reliability, service efficiency, governance maturity, and patient satisfaction while supporting continuous organizational improvement.

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