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AI-BASED OPERATIONAL EFFICIENCY AND QUALITY MANAGEMENT AT MGM HEALTHCARE

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ABSTRACT

The healthcare sector is undergoing rapid transformation with the integration of advanced technologies, particularly Artificial Intelligence (AI), to improve operational efficiency and quality management. This study focuses on analyzing how AI-based systems contribute to enhancing hospital performance at MGM Healthcare. The research examines key operational areas such as patient flow, resource utilization, workflow coordination, and service delivery, along with the role of quality management practices in ensuring better patient outcomes.

The study adopts a structured research methodology using both primary and secondary data. Statistical tools such as percentage analysis, ANOVA, and Chi-square tests are applied to evaluate relationships between operational efficiency, service quality, and patient satisfaction. The findings reveal that AI technologies, including Hospital Information Systems (HIS), Electronic Medical Records (EMR), and telemedicine, significantly improve decision-making, reduce waiting time, and enhance overall service quality.

The results also indicate that effective quality management practices, supported by trained staff and proper coordination, lead to higher patient satisfaction. However, challenges such as system adaptation and workload management still need attention. The study concludes that the integration of AI with efficient management practices plays a crucial role in achieving sustainable healthcare performance and improving patient care.

KEY WORDS: *Artificial Intelligence (AI), Operational Efficiency, Quality Management, Healthcare Systems, Patient Satisfaction, Hospital Information System (HIS),Electronic Medical Records (EMR), Telemedicine, Resource, Utilization, Workflow Optimization.*

1. INTRODUCTION

MGM Healthcare is more than just another hospital in Chennai; it's a place where real human care and state-of-the-art medicine coexist. Since we first opened, we have been redefining healthcare in India by fusing top-notch knowledge with cutting-edge technology that genuinely improves patients' lives.

More than 400 beds are located in our main facility, which is intended to heal rather than merely treat. In order to create a setting where patients feel at ease while receiving some of the most cutting-edge medical care available in South India, we've considered everything from natural light to energy efficiency. Whether a patient requires orthopaedic care, brain surgery, a heart procedure, or an organ transplant, our teams combine in-depth knowledge with cutting-edge methods like robotic surgery and minimally invasive procedures to benefit patients.

2. PROBLEM STATEMENT

Even Many hospitals are still trying to develop an operationally sustainable business model because sustainability in healthcare delivery is becoming a more significant aspect of healthcare management. Operational waste, energy use, ethical organisational practices, and building a long-term stable organization are all issues.

MGM Healthcare (Chennai), a well-known multispecialty hospital, operates in a challenging and cutthroat industry. MGM Healthcare lacks an organised evaluation of the efficiency of its day-to- day operations and the management of its quality and sustainability processes, despite having numerous cutting-edge facilities and services. This shortcoming makes it crucial to assess how well the hospital's operational procedures adhere to anticipated standards of sustainability and quality and to pinpoint areas

3. RESEARCH OBJECTIVES AND QUESTIONS

3.1Research Objectives

- To assess operational efficiency and quality management practices at MGM Healthcare and identify strengths, gaps, and improvement opportunities.
- To analyze key hospital processes (patient flow, admissions, billing, clinical coordination) and their impact on efficiency.

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- To evaluate quality systems and compliance with NABH and Joint Commission International standards.

3.2 Research Questions

RQ1: How does Artificial Intelligence improve operational efficiency in MGM Healthcare?
RQ2: How effective are quality management practices in enhancing patient care and service quality at MGM Healthcare?

4. REVIEW OF LITERATURE

The literature review provides an overview of prior studies on artificial intelligence, operational effectiveness, and quality management in healthcare. It illustrates how innovative technologies like artificial intelligence (AI), the Internet of Things (IoT), and digital systems are transforming hospital operations and improving patient care. Previous research has emphasised the importance of efficient resource utilisation, process optimisation, and data-driven decision-making in healthcare organisations. The surveys also address issues including worker acceptability, data security, and technology adoption. In general, the literature aids in pinpointing important ideas, unmet research needs, and the applicability of AI to improving hospital performance.

Table 4.1:Compendium of Reviewed Literature on AI-Based Operational Efficiency and Quality Management in Healthcare (N = 26)

S.No	Author(s) & Year	Article Title	Journal / Source	Key Findings	Relevance to Present Study
1	Chauhan et al. (2026)	AI in Smart Healthcare Systems	Book Chapter	AI improves diagnostics, monitoring, and decision- making using ML, IoT, and big data.	Shows how AI enhances operational efficiency and supports advanced hospital systems. Helps understand AI role in MGM Healthcare.
2	Huang et al. (2026)	Healthcare Efficiency Analysis using SBM- DDF-GML	Research Study	Identifies efficiency gaps and importance of resource optimization using advanced models.	Supports evaluating operational efficiency and resource utilization in hospitals like MGM.
3	Zhao et al. (2026)	AI Agents in Healthcare	Journal Article	AI agents improve diagnostics, monitoring, and clinical decisions with ethical considerations.	Explains AI application in hospital management and its impact on service quality.
4	Alfarizi & Noer (2025)	Green Practices & Digital Healthcare	Journal Article	Sustainable and digital practices improve service quality and brand image.	Highlights importance of sustainability in quality management at MGM Healthcare.
5	Chocknakawaro & Pusaksrikit (2025)	Service Quality & Patient Loyalty	Journal Article	Service quality directly impacts patient satisfaction and loyalty.	Helps analyze patient satisfaction and service quality in hospital settings.
6	Gholampour et al. (2025)	Explainable AI in Financial Performance	Journal Article	AI improves financial analysis and decision-making transparency.	Useful to understand AI role in operational and financial efficiency.

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7	Jaiswal et al. (2025)	AI & Digital Transformation in Healthcare	Edited Volume	Digital tools enhance efficiency, decision-making, and service delivery.	Supports integration of AI technologies in improving hospital operations.
8	Kumar et al. (2025)	AI-driven Operational Management	Journal Article	AI improves workflow and resource use; employee acceptance is key.	Shows importance of staff attitude in successful AI implementation.
9	Pellegrino (2025)	Operations Management in Healthcare	Journal Article	Efficient workflow and planning improve performance and reduce cost.	Supports analysis of hospital operational processes and efficiency.
10	Puspitasari et al. (2025)	AI-based Strategic Management	Literature Review	AI optimizes resource allocation and workflow efficiency.	Helps in understanding AI strategies for improving hospital performance.
11	Panagoulias et al. (2025)	AI In Biomedical Applications	Journal Article	AI enhances diagnostics but requires ethical and technical frameworks.	Relevant for safe AI implementation in healthcare systems.
12	Saravanan (2025)	Geriatric Healthcare Insights	Journal Publication	Highlights challenges and innovations in elderly care.	Provides insight into improving specialized healthcare services.
13	Setiawaty et al. (2025)	Digital Health & Telemedicine	Journal Article	Technology adoption improves healthcare accessibility and sustainability.	Supports role of telemedicine and digital tools in service quality.
14	Soumy& Bhuvaneshwari (2025)	AIoT in Healthcare	Journal Article	AIoT enables real-time monitoring and better decision-making.	Shows how IoT + AI improves operational efficiency.
15	Vianna et al. (2025)	Lean Healthcare	Journal Article	Lean practices reduce waste and improve patient flow.	Useful for improving operational efficiency and reducing waiting time.
16	Yasmin et al. (2025)	AI-CDSS in Healthcare	Journal Article	AI improves clinical decisions but needs proper governance.	Relevant to decision support systems in hospital operations.
17	Alharbi et al. (2024)	Interdisciplinary Healthcare Collaboration	Journal Article	Collaboration improves patient safety and reduces errors.	Supports quality management and teamwork in hospitals.
18	Lawal (2024)	AI for Sustainable Hospital	Journal Article	AI optimizes energy, waste, and resources.	Aligns with Sustainable quality management in MGM

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		Operations			Healthcare.
19	Forsythe et al. (2023)	AI Trends in Healthcare	Report	AIimproves diagnostics and automation but needs regulation.	Provides background on AI adoption challenges and benefits.
20	Krishnamoorthi et al. (2023)	Hand Hygiene & Safety	Journal Article	Monitoring improves safety and reduces infections.	Highlights importance of quality control practices.
21	Al-Rawashdeh et al. (2022)	IoT in Healthcare	Systematic Review	IoT improves monitoring and operational efficiency.	Supports use of digital technologies in hospital management.
22	Nepomuceno et al. (2022)	Hospital Efficiency Models	Review Study	Analytical models improve efficiency measurement.	Helps evaluate hospital performance scientifically.
23	Tadavarthi et al. (2022)	AI in Radiology Operations	Journal Article	AI improves workflow and reduces administrative burden.	Shows operational benefits of AI in hospital departments.
24	Al-Rawashdeh et al. (2022)	IoT Applications in Healthcare	Review	IoT supports real-time data and better decisions.	Reinforces importance of digital integration.
25	Valls Martinez et al. (2021)	Health Investment & Quality	Journal Article	Proper investment improves healthcare quality outcomes.	Relevant for resource allocation and quality improvement.
26	Floruss & Vahlpahl (2020)	AI Acceptance in Healthcare	Journal Article	Trust and ease of use influence AI adoption.	Important for understanding staff acceptance of AI systems.

Note. Source: *The above table is compiled from various journal articles, research papers, and published studies related to artificial intelligence, operational efficiency, and quality management in healthcare. The sources include recent scholarly contributions from 2020 to 2026 covering global healthcare systems. These studies were selected based on their relevance to hospital operations, technology adoption, and patient care improvement. The compilation is prepared by the researcher for academic purposes.*

5. PROPOSED CONCEPTUAL FRAMEWORK

The relationship between artificial intelligence (AI) technologies, operational efficacy, and quality management techniques in enhancing overall hospital performance at MGM Healthcare is explained by the study's proposed conceptual framework. AI tools that affect operational processes like patient flow, resource utilisation, and workflow coordination include machine learning, hospital information systems (HIS), electronic medical records (EMR), and telemedicine. Healthcare outcomes, patient satisfaction, and service quality are examples of dependent variables that are impacted by these operational factors.Additionally, the framework takes into account quality management practices (continuous monitoring, patient safety, and NABH/JCI standards) as a mediating factor that enhances the connection between hospital performance and AI adoption. The success of AI implementation is also influenced by moderating variables such as staff acceptance, training, and technology infrastructure.

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Table 1. Summary of Study Variables

S.No	Variables Type	Variables	Components	Description
1	Independent Variable	Artificial Intelligence (AI) Technologies	Machine Learning, HIS, EMR, Telemedicine	AI tools used in hospitals to improve decision-making, automation and service delivery.
2	Mediating Variable	Operational Efficiency	Patient Flow, Resource Utilization, Workflow Coordination	Ensures smooth hospital operations by reducing delays and improving efficiency.
3	Moderating Variable	Organizational Factors	Staff Attitude, Training, Infrastructure	Influences the effectiveness of AI implementation and operational performance.
4	Dependent Variable	Quality Management & Patient Outcomes	Service Quality, Patient Satisfaction, Safety Standards	Reflects overall hospital performance and quality of care delivered to patients.

6. RESEARCH METHODOLOGY

The methodical approach taken to carry out the study and accomplish its goals is explained by research methodology. It comprises the study's analytical tools, sampling strategies, data collection methods, and research design. This section aids in ensuring the validity, reliability, and scientific structure of the research. This study examines MGM Healthcare's operational effectiveness and quality control using both primary and secondary data. The methodology offers a precise framework for gathering, evaluating, and interpreting data in order to derive significant conclusions..

7.RESULTS AND DISCUSSION

The data gathered from respondents to assess MGM Healthcare's operational effectiveness and quality control is analysed and interpreted in this part. The findings show that the use of digital technology and artificial intelligence has greatly enhanced hospital operations, including patient flow, resource utilisation, and service delivery. Relationships between factors including service quality, patient satisfaction, and operational performance were found using statistical techniques like Chi-square tests, ANOVA, and percentage analysis.The results show that the majority of respondents are content with the infrastructural amenities, personnel conduct, and quality of healthcare services. Additionally, it has been shown that good departmental collaboration, skilled medical personnel, and efficient communication all improve patient satisfaction. But there are still issues like waiting times, workloads, and system adaptability.

7.1 KEY FINDINGS

According to the report, MGM Healthcare's operational efficiency has greatly increased as a result of the use of digital technology and artificial intelligence. It has improved departmental workflow collaboration and decreased patient wait times. Data management and decision-making procedures have improved with the usage of technologies like HIS and EMR. The results also show that improved patient satisfaction and service quality are associated with effective quality management strategies. Most respondents said they were satisfied with hospital infrastructure, staff conduct, and communication. But there are still some difficulties, such workload and system adaption. The report emphasises how important employee acceptance and training are to the effective application of AI. In general, better healthcare performance and sustainability result from the combination of AI with quality management techniques.

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Table 2. Hypothesis Testing Results

S.No	Statistical Tool	Applicable Question	Result	Interpretation
1	Percentage Analysis	Demographic details (Age, Gender, Education)	Majority respondents fall under a specific category	Helps understand respondent profile and distribution
2	Percentage Analysis	Patient satisfaction and service quality	High percentage of positive responses	Indicates overall satisfaction with hospital services
3	ANOVA	Relationship between demographic factors and satisfaction	Significant difference found ($p < 0.05$)	Demographic factors influence patient satisfaction
4	ANOVA	Impact of operational factors on service quality	Significant relationship observed	Operational efficiency affects quality of service
5	Chi-Square Test	Association between service quality and patient satisfaction	Significant association found	Service quality directly impacts patient satisfaction
6	Chi-Square Test	Relationship between AI usage and efficiency	Significant association observed	AI implementation improves operational efficiency

8.CONCLUSION

The study concludes that the integration of Artificial Intelligence and digital technologies plays a significant role in improving operational efficiency and quality management at MGM Healthcare. The use of advanced systems such as HIS, EMR, and AI-based tools has enhanced workflow coordination, resource utilization, and decision-making processes. The findings indicate that effective quality management practices contribute to higher patient satisfaction and better service delivery.

Although the hospital demonstrates strong performance in terms of infrastructure, staff behavior, and service quality, certain challenges such as patient waiting time and adaptation to new technologies still exist. The study highlights that continuous staff training, proper planning, and technological support are essential for maximizing the benefits of AI implementation

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REFERENCE

1. *Chauhan, R., Alwan, A., & Hamdar, B. (2026). Artificial Intelligence in Smart Healthcare Systems. Book Chapter.*
2. *Huang, X., et al. (2026). Efficiency and demand dynamics of primary healthcare systems using SBM- DDF-GML model. Journal of Healthcare Management.*
3. *Zhao, L., Liu, X., Xin, T., Tan, W., Wang, Y., Li, Z., & Zhang, H. (2026). AI agents in healthcare: Applications and evaluation. Healthcare Informatics Journal.*
4. *Alfarizi, M., & Noer, B. (2025). Green practices and digital healthcare services. Sustainable Healthcare Journal.*
5. *Chocknakawaro, P., & Pusaksrikit, T. (2025). Service quality, patient satisfaction, and loyalty. International Journal of Healthcare Management.*
6. *Gholampour, M., Asadi, A., & Dehghan, M. (2025). Explainable AI in hospital financial performance. Journal of Health Economics.*
7. *Jaiswal, S., Mishra, P., & Singh, R. (2025). Digital Transformation and AI in Healthcare. Edited Volume.*
8. *Kumar, R., Singh, A., Ahmed Kassar, M., Humaida, N., Joshi, V., & Sharma, P. (2025). AI-driven operational management systems. Healthcare Operations Journal*
9. *Pellegrino, R. (2025). Operations management in healthcare sector. Operations Management Review.*
10. *Puspitasari, D., Dhartono, A., Yudha, K., Devina, R., & Andriani, S. (2025). AI-based strategic management in hospitals. Healthcare Strategy Journal.*

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11. *Panagoulias, D., Tsihrintzis, G., & Virvou, M. (2025). AI in biomedical applications. Biomedical Informatics Journal.*
12. *Saravanan, S. (2025). Geriatric healthcare insights.Journal of Indian Academy of Geriatrics.*
13. *Setiawaty, V., Nurmalita, S., & Yuliati, T. (2025). Digital health and telemedicine adoption. Telemedicine Journal.*
14. *Soumya, R., & Bhuvaneshwari, K. (2025). AIoT in healthcare diagnostics. Journal of Smart Healthcare.*
15. *Vianna, M., Bonamigo, A., Sobral, J., & Calado, R. (2025). Lean healthcare implementation. Healthcare Quality Journal.*
16. *Yasmin, S., Akbar, M., & Haider, A. (2025). AI-CDSS in healthcare systems. Healthcare Technology Journal.*
17. *Alharbi, F., et al. (2024). Interdisciplinary collaboration in healthcare. Journal of Clinical Practice.*
18. *Lawal, O. (2024). AI for sustainable hospital operations. Sustainable Healthcare Review.*
19. *Forsythe, J., Green, P., Roberts, L., Ewedairo, T., Sadiq, M., & Mkwashi, D. (2023). AI trends in healthcare. Healthcare Innovation Report.*
20. *Krishnamoorthi, S., et al. (2023). Hand hygiene and infection control. Indian Journal of Public Health.*
21. *Al-Rawashdeh, M., Keikhosrokiani, P., Belaton, B., Alawida, M., & Zwiri, A. (2022). IoT in healthcare systems. Journal of Medical Systems.*
22. *Nepomuceno, T., Piubello Orsini, L., de Carvalho, V., Poleto, T., & Leardini, F. (2022). Hospital efficiency analysis. Health Systems Review.*
23. *Tadavarthi, A., Makeeva, V., Wagstaff, J., Zhan, T., Podlasek, S., Bhatia, S., & Trivedi, H. (2022). AI in radiology operations. Radiology Management Journal. Valls Martínez, M., Ramírez-Orellana, A., & Grasso,*
24. *M. (2021). Health investment and quality. Public Health Journal.*
25. *Floruss, K., & Vahlpahl, T. (2020). AI acceptance in healthcare. Healthcare Technology Journal.*