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Predictive Analytics of Employee Turnover at Sree Mookambika Institute of Medical Science, Kulasekaram

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Abstract

In the modern healthcare sector, employee retention has become a major challenge affecting organizational stability, service quality, and workforce efficiency. This study examines the role of predictive analytics in identifying and managing employee turnover at Sri Mookambikai Hospital. The research focuses on understanding how predictive analytics can help healthcare organizations identify factors influencing employee attrition and support effective retention strategies. Primary data were collected from employees using a structured questionnaire, while secondary data were gathered from journals, reports, articles, and academic sources. Statistical tools such as Key Influencer in Power BI, Multiple regression and factor analysis were used to analyze the collected data. The findings indicate that predictive analytics significantly helps in identifying turnover patterns, improving workforce planning, and enhancing employee retention. Factors such as workload, compensation, leadership support, career growth opportunities, and work environment were found to strongly influence employee turnover. However, challenges including data accuracy, employee adaptability, workload stress, and implementation difficulties remain. The study concludes that predictive analytics plays an important role in reducing employee turnover and improving organizational effectiveness in the healthcare sector, provided that proper HR strategies, employee engagement initiatives, and continuous monitoring systems are effectively implemented.

Keywords: Employee Engagement, Employee Retention, Employee Turnover, Healthcare Sector, Healthcare Management, Workforce Planning, Organizational Performance, Workforce Stability

Introduction

Predictive analytics has become an important tool in Human Resource Management, particularly in the healthcare sector where employee retention directly affects organizational performance and quality of patient care. Hospitals rely heavily on skilled professionals such as doctors, nurses, technicians, and administrative staff, making workforce stability essential for efficient healthcare services. High

employee turnover leads to increased recruitment and training costs, reduced employee morale, and disruptions in healthcare delivery. Predictive analytics helps organizations identify turnover risks by analyzing factors such as workload, job satisfaction, compensation, work environment, and career development opportunities, enabling management to take proactive retention measures. This study focuses on employee turnover at Sri Mookambikai Hospital using predictive analytics techniques. The study aims to identify the major factors influencing employee attrition and examine how data-driven HR practices support workforce planning, employee engagement, and retention. By adopting predictive analytics, the hospital can improve decision-making, enhance operational efficiency, and develop effective strategies to reduce employee turnover and strengthen organizational performance.

Literature Review

Reynold Navarro Mazo and co-authors (2025) studied employee turnover prediction using personality assessment and found that behavioral traits, job satisfaction, and organizational environment significantly influence employee turnover. The study concluded that predictive analytics improves workforce management and supports proactive retention strategies. Intan Susilawati and co-authors (2025) conducted a comparative study between industries and identified factors such as compensation, workload, work environment, and psychological well-being as major predictors of employee turnover. The study emphasized the importance of industry-specific predictive models for effective employee retention. Tan Yu Pei and associates (2024) examined how organizations use HR predictive analytics for talent management decision-making. The study found that job satisfaction, organizational support, and behavioral factors play an important role in predicting turnover intentions and improving retention strategies. Akram M. Alhamad and co-authors (2024) analyzed the role of advanced HR analytics in employee engagement and turnover prediction. The study concluded that leadership quality, organizational culture, work–life balance, and employee engagement significantly affect employee retention and organizational stability. Likith Kumar C M and co-authors (2024) developed a comprehensive model for attrition forecasting and highlighted that compensation, career growth opportunities, managerial support, and employee engagement are key determinants of turnover. The study emphasized that predictive models help HR departments implement proactive retention measures. training, job satisfaction, work environment, and leadership as major contributors to attrition. The study highlighted the importance of predictive analytics in improving retention strategies and workforce stability.

Research Objectives

- To study the role of predictive analytics in improving employee engagement and retention.
- To examine how predictive analytics enhances HR workflow efficiency in hospitals.

Research Methodology

The present study adopts a descriptive research design to systematically examine employee turnover and workplace conditions at Sree Mookambika Institute of Medical Sciences. The study population consists of 200 employees, out of which 132 employees were selected using purposive sampling to obtain relevant and accurate responses. Both primary and secondary data were used for the study. Primary data were collected through structured questionnaires, interviews, and personal interactions with employees, while secondary data were gathered from journals, research articles, company reports, books, websites, and other online sources. Statistical tools such as Multiple Regression Analysis and Factor & Regression Analysis were used to analyze the data and identify factors influencing employee turnover and HR workflow efficiency.

Multiple Regression Analysis

It is a statistical technique used to examine the relationship between one dependent variable and multiple independent variables

$\mathbf{H_0}$: Predictive analytics factors do not significantly impact employee engagement.

Table 1 Predictive Analytics Factors Influencing Employee Engagement

Variables	Beta	t-value	Sig.	Remarks
Early warning system	-0.16	-1.28	0.203	Not significant
Timely actions taken	0.315	2.374	0.019	Significant
Data usage for engagement	0.002	0.016	0.987	Not significant
Feedback usage	-0.171	-1.328	0.187	Not significant
Management action	0.022	0.154	0.878	Not significant
Data-based decision	0.258	2.160	0.033	Significant

Source: Primary data

The regression analysis revealed that timely intervention and data-based managerial decisions significantly improved employee engagement among employees. Other predictive analytics factors were found to be statistically insignificant. The findings indicate that predictive analytics is effective when organizations convert analytical insights into practical retention strategies.

Factor and Regression Analysis

Factor analysis is a statistical technique used to reduce a large number of variables into a smaller set of underlying factors based on their correlations. Regression analysis is a statistical method used to examine the relationship between dependent and independent variables.

$\mathbf{H_0}$: Predictive analytics factors do not significantly impact HR workflow efficiency.

Table 2 Predictive Analytics Factors Affecting HR Workflow Efficiency

Variables	Beta	Sig.	Remarks
Performance evaluation	0.275	0.000	significant
Staffing Planning	0.239	0.000	Significant
Scheduling allocation	0.025	0.675	Not significant
Performance decision	0.146	0.017	Significant
Training needs	0.467	0.000	Significant
Training planning	0.414	0.000	Significant

Source: Primary data

The regression analysis revealed that predictive analytics significantly improves HR workflow efficiency. Factors related to training, workforce planning, and performance management showed strong positive influence, while one factor was found to be statistically insignificant. The findings suggest that predictive analytics supports effective HR operations through improved planning, training, and decision-making processes.

Findings of the Study

- Majority of the respondents (68.2%) are female employees, while 31.8% are male employees.
- Most of the respondents belong to the age group below 25 years (34.8%), indicating a young workforce in the hospital.

- A higher proportion of respondents possess B.Sc. Nursing qualification (42.4%), followed by GNM qualification (36.4%).
- Majority of the respondents work in the General Ward department (28.7%), followed closely by OT employees (27.3%).
- Most employees have 1–3 years of work experience (44.7%), showing that the organization consists largely of early-career employees.
- A significant number of employees earn between 15,000–20,000 per month (30.3%).
- More than half of the respondents (55.3%) expressed an intention to leave the organization within the next year, indicating high turnover intention among employees.
- Majority of employees agreed that workload on each shift is manageable, though some employees still experience stress due to workload.
- Employees generally feel that salary and benefits are fair, but a notable proportion remain neutral or dissatisfied.
- Employees in demanding departments such as OPD, OT, and Emergency Medicine showed higher turnover intention compared to other departments.
- Employees with more than 6 years of experience exhibited higher turnover intention, indicating retention challenges among senior staff.
- Multiple Logistic Regression analysis showed that supervision and leadership is the only statistically significant factor influencing employee turnover.
- Multiple Regression analysis indicated that timely managerial action and data-based decision-making positively influence employee engagement.
- Factor Analysis grouped predictive analytics variables into important HR dimensions such as workforce planning, scheduling efficiency, performance management, and training management.
- Regression analysis confirmed that predictive analytics factors significantly improve HR workflow efficiency in hospitals.

Suggestions of the Study

- The hospital management may focus on improving leadership quality and supervisory support, as supervision and leadership significantly influence employee retention.
- Better career growth opportunities and promotion policies can be introduced to reduce turnover intention among employees.
- Management may provide regular training and skill development programs to improve employee engagement and satisfaction.
- Workload in departments such as OPD, OT, and Emergency Medicine may be balanced through proper staffing and scheduling practices.
- Employee recognition and reward systems can be strengthened to improve morale and retention.
- The hospital may adopt employee wellness and stress management programs to reduce work-related stress.
- Management can improve salary structures and additional benefits to increase employee satisfaction and reduce turnover.
- Feedback from employees can be collected regularly and management may respond quickly to employee concerns.
- Senior and experienced employees may be given additional recognition, leadership opportunities, and career advancement support to improve retention.
- Hospitals can strengthen work–life balance policies by introducing flexible scheduling and supportive shift arrangements.
- Management can improve communication between supervisors and employees to create a positive work environment.

Conclusion

The study concludes that employee turnover in hospitals is influenced by factors such as leadership quality, workload, salary and benefits, career growth, work environment, and employee engagement. The findings indicate a significant intention among employees to leave, emphasizing the importance of effective retention strategies. Supportive management, proper communication, and career development opportunities contribute to higher employee satisfaction and retention.

The study also highlights the role of predictive analytics in improving HR efficiency and workforce management. Tools such as Power BI, regression analysis, logistic regression, and factor analysis helped identify turnover patterns and employees at risk of leaving. Integrating data-driven HR practices with employee-focused management can help reduce turnover and improve organizational performance.

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