

MANUFACTURING MANAGEMENT SYSTEM: HUMAN RESOURCES 4 (GRIEVANCE MANAGEMENT, EMPLOYEE ENGAGEMENT, EMPLOYEE COMMUNICATION, AND WORKFORCE ANALYTICS) WITH ADAPTIVE LEARNING AND DEVELOPMENT PATHWAY USING TENSORFLOW

ABSTRACT

AUTHORS

Aljon Arellano
Ma. Graciella Canales
Jasmin Dela Piedra
James Royce Icaranom
Joemar Samillano

RESEARCH ADVISER

Rommel J. Constantino, DIT

AFFILIATION

Bestlink College of the
Philippines

DISCIPLINE

Information Systems

KEYWORDS

*grievance management;
employee engagement;
workforce analytics; adaptive
learning; employee
communication; human
resource technology*

ARTICLE ID

AASGBCPJMRA-B79544

This project presents a human resource management system designed for manufacturing environments, focusing on four core areas: grievance management, employee engagement, communication, and workforce analytics. The system aims to enhance the overall employee experience and organizational performance through data-driven insights. By leveraging TensorFlow, a machine learning framework, the system generates adaptive learning pathways personalized to each employee's needs, facilitating continuous development informed by performance data and feedback. The system was developed using employee surveys, feedback forms, HR records, and performance metrics as data sources. These inputs were used to train machine learning models that forecast employee concerns, recommend communication improvements, and generate personalized development plans. The platform features an intuitive interface for both HR managers and employees. Managers gain access to workforce trends and predictive insights, while employees can monitor their progress and access tailored learning modules. Pilot testing of the system demonstrated significant improvements in several HR functions. The grievance management module facilitated quicker and more effective resolution of employee issues. Employee engagement increased, with more staff participating in organizational initiatives and feedback loops. Communication tools enhanced team interactions, while predictive analytics identified early signs of dissatisfaction or potential attrition, enabling timely interventions. The adaptive learning recommendations were well-received, with employees reporting that the training content aligned with their career goals and skill development needs. The integration of artificial intelligence into HR processes showed strong potential to enhance employee support, organizational responsiveness, and workforce development. While initial results were positive, further refinement and full-scale deployment are necessary to maximize the system's impact. Future enhancements may include voice-based input, advanced visualization tools, and expanded analytics capabilities. Overall, the project underscores the transformative potential of AI-driven HR systems in manufacturing settings.

RECOMMENDED CITATION

Arellano, A., Canales, M. G., Dela Piedra, J., Icaranom, J. R., & Samillano, J. (2025). Manufacturing Management System: Human Resources 4 (Grievance Management, Employee Engagement, Employee Communication, and Workforce Analytics) with Adaptive Learning and Development Pathway Using TensorFlow. *Ascendens Asia Singapore – Bestlink College of the Philippines Journal of Multidisciplinary Research Abstracts*, 7(3), 58.