

Human Resource Functions and Ai Utilization in Selected Manufacturing Companies in Calamba City Toward HR Process Optimization

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Abstract

In the context of people management, a business performs well if the Human Resources Management (HRM) or Human Resources (HR) involves managing a company's employees strategically to align with business goals. As the need for manufacturing grows, some companies in Calamba City can find opportunities. However, the human resources department has to deal with some challenges in HR functions. The high demand for advanced technology, such as AI that demonstrates interpretable algorithms, is often seen in HR functions like Talent Acquisition, managing HR Analytics, Learning and Development, and Compensation Management; these factors are essential for continuous business growth and development. The main objective of the research is to recommend a transformative AI utilization for human resources management focusing on Talent Acquisition, HR Analytics, Learning and Development, and Compensation Management. The study is limited only to the presentation of the possible AI applications related to AI-powered tools, methods, and practices that will improve HR functions and make them more in line with business goals. Quantitative research was used. The researcher also constructed interviews, observations, and a survey checklist to assess and further analyze the reports. The thirty-nine (39) HR personnel have been chosen as the respondents from the seven (7) selected manufacturing companies in Calamba City. The majority of HR personnel say that having a semi-AI process their payroll system under compensation management functions is moderately effective, while majority of the chosen manufacturing companies in Calamba City use manual approaches for HR functions for Talent Acquisition, HR Analytics, and Learning and Development with low effectiveness.

Keywords: Human Resources Functions, Artificial Intelligence (AI), Talent Acquisition, HR Analytics, Learning and Development, Compensation Management, Approaches, Level of Effectiveness, Calamba City

Introduction

Nature and Scope of the Problem Investigated

Human resource (HR) management, often called Human Resources (HR), comprises all the activities involved in managing a company's employees strategically, encompassing areas like Talent Acquisition, HR Analytics, Learning and Development, and Compensation Management. And because talent is any organization's most valuable resource, effective HR management is critical to organizational success and growth.

In a competitive market, a company's success and sustainability depend on its human resource management (HRM). Effective HR practices ensure an organization has the skilled and engaged employees needed to achieve its vision and remain competitive. With the right people and programs, a company can fulfill its objectives and sustain its market position.

Statistica (2024) stated that the Philippines is on its way to becoming a developing manufacturing hub in Asia. With a gross domestic product (GDP) contribution of about 3.78 trillion Philippine pesos in 2023, manufacturing was the second-largest sector in the Philippines. (Statistica, 2024).

One major challenge for HR in the manufacturing sector is the turnover of HR personnel, which can impact crucial functions like talent acquisition, analytics, and employee development. This personnel turnover is a significant dilemma for the seven manufacturing companies in Calamba City, as it can threaten organizational sustainability and success. By leveraging AI-driven tools, HR departments can consistently and efficiently manage their workforce. This reduces the heavy reliance on HR personnel, who can be difficult to replace quickly due to the specialized qualifications and time required to learn essential HR functions.

AI offers meaningful ways to lighten the workload of HR professionals by automating repetitive tasks. This includes functions such as talent acquisition, HR analytics, learning and development, and compensation management. By handling these duties, AI frees up valuable time for HR personnel to focus on high-value activities and strategic analysis. It has been an up-and-coming trend of using AI technologies in human resources management for the last two decades.

Studies have found that AI provides promising solutions for human resources people, starting from screening applicants to the employee retention stage by taking over time-consuming and repetitive tasks of the HR team, enhancing the quality of the HR processes with neutralized biases. Hmoud & Várallyai (2020).

Research Problems and Objectives

The main objective of the research is to determine and establish AI-driven tools, techniques, and procedures that will optimize Human Resources Department functions, focusing on Talent Acquisition, HR Analytics, Learning and Development, and Compensation Management to achieve optimization in HR processes for keeping HR personnel as a long-term solution to sustaining business growth and development.

This study was pursued to address the following concerns:

1. What are the identified HR approaches for Human Resource functions of the selected manufacturing companies in Calamba City?
 - a) Talent Acquisition
 - b) HR Analytics
 - c) Learning and Development
 - d) Compensation Management
2. What is the perceived level of effectiveness among the HR approaches on the following Human Resource functions of the selected manufacturing companies in Calamba City?
 - a) Talent Acquisition
 - b) HR Analytics
 - c) Learning and Development
 - d) Compensation Management
3. What are the recommended AI utilizations for Human Resource functions of the selected manufacturing companies in Calamba City?

Research Framework or Focus

As depicted in Figure 1, the conceptual framework for this study is built on the 4Ps of the HR brand model. It analyzes both manual and AI-driven approaches to optimize key HR functions within manufacturing companies in Calamba City. The framework aligns "People" with Talent Acquisition (selection and interviews), "Pay" with Compensation Management (payroll and incentives), "Process" with Learning and Development (training and feedback), and "Promotion" with HR Analytics (employee data and turnover rates).

The model ultimately proposes potential strategies for people management and the application of AI to support HR personnel for the benefit of both employers and employees.

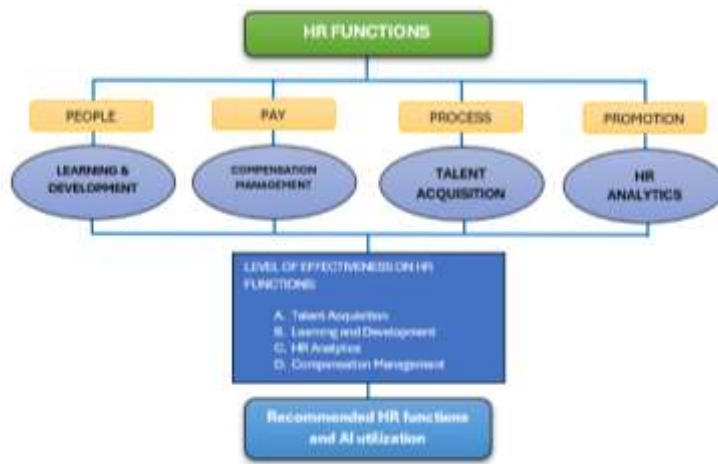


Figure 1. AI Utilization in Human Resource Function

Research Significance

In today's fast-paced and competitive business world, the use of Artificial Intelligence (AI) in Human Resource Management has become increasingly important. The study of how AI aids human resource management in manufacturing companies is essential for comprehending how technology can mitigate HR personnel turnover, manage personnel within the organization, and contribute to the achievement of desired objectives

By looking into this subject, the researcher hopes to find useful ideas that could help recommend current HR functions by using AI-powered tools for finding new human capital and deployment, HR analytics, training and education, and compensation and salary management. This helps the HR department reach its goals and make the whole workforce more stable and productive. This study also significantly contributes to the development of HR functions in the future for all key respondents in the same industry.

Scope and Limitations

Scope. My study covered how the human resources departments of selected manufacturing companies in Calamba City function, currently handling of HR functions by their HR personnel. This phase includes examining the level of effectiveness of the Talent Acquisition, HR Analytics, Learning and Development, and Compensation Management.

The study also suggests AI-powered tools, methods, and practices that improve HR functions and make them more in line with business needs. This step helps the business grow and be successful in the future. The respondents are the HR department employees who were responsible for the process.

Limitations. Certain restrictions inhibit me as a researcher. Since HRM encompasses a broad scope, the survey checklist is limited to only four (4) HR functions that are significantly needed in manufacturing companies in Calamba City, such as Talent Acquisition, HR Analytics, Learning and Development, and Compensation Management. Each selected function is limited only to three (3) categories - for Talent Acquisition; the checklist focuses more emphasis on the selection of candidates, examination, and interview. The HR Analytics functions focus on employee data, turnover rate, and hiring/filling time. In Learning and Development, the checklist focuses on training needs analysis, training programs, and feedback, whereas in Compensation Management, the survey checklist emphasizes the payroll system, bonuses, and other incentives, as well as salary structure.

Definition of Terms

HR Functions. These functions encompass all the activities related to managing a company's workforce. These include recruiting, hiring, onboarding, training, and managing employee relations, benefits, compensation, and performance. Essentially, HR departments are responsible for the entire employee lifecycle at work, from recruitment to offboarding, ensuring a productive and compliant working environment.

HR Approaches. These refer to a method or way of doing or handling something for HR processes such as manual, semi-AI and advanced-AI.

Artificial Intelligence (AI). It is a field of science concerned with building computers and machines that can reason, learn, and act in such a way that would normally require human intelligence or that involves data whose scale exceeds what humans can analyze.

Talent acquisition. It is the process of identifying, attracting, selecting, and retaining highly qualified people. It involves a key part of the employee journey and is arguably one of the most important drivers of organizational success.

Learning and development. These terms are often used interchangeably, in the world of L&D, they are two separate approaches. *Learning* is the process of absorbing and retaining information that takes place over time.

It expands one's viewpoint and knowledge base for immediate application, as well as preparation for future endeavors. *Training* is an instruction event for a specific skill or task that employees need to learn for a work scenario.

Compensation Management. It is the process of determining and administering employee pay and benefits, encompassing salary, incentives, and benefits packages, to attract, motivate, and retain talent.

Philosophical Underpinnings

The study is rooted in positivism, as it follows a hierarchical and experimental approach to establish causality. The research aims to determine the effects of AI on HR functions—specifically Talent Acquisition, Learning and Development, HR Analytics, and Compensation Management—in selected manufacturing companies. This approach is consistent with the positivist principle of using initiatives and controlled methods to achieve targeted, measurable results.

Methodology

Research Design

This study employed a descriptive or survey research design, a quantitative method that utilizes a survey checklist as a tool to conduct the survey. Quantitative research involves collecting numerical data through surveys, or observations. The researcher analyzed this evidence using statistical methods to draw

conclusions and make generalizations about a population. To ensure valid and reliable results, consider how to select respondents, determine the sample size, and account for confounding variables.

Research Locale

This research was undertaken in Calamba City. Respondents to this study are people who work in the human resources departments, the "HR Personnel," of certain manufacturing companies in Calamba City. The study assessed the current manual, semi-AI, and advanced-AI implementations in human resources management and collected additional pertinent data. The researcher selected Human Resources personnel as the respondents because they perform and manage the company's human resource functions.

Population and Sampling Design

The Human Resources department personnel of selected manufacturing companies chosen as respondents in the research specifically on the matter of statement of the problem no. 1: What are the identified HR approaches for Human Resource functions and 2: What is the perceived level of effectiveness among the Human Resources approaches on the following Human Resource functions of the selected manufacturing companies in Calamba City?

Total population of thirty-nine (39) Human Resources personnel of the selected companies' including Heads, Officers, Staff and Assistant from seven (7) selected manufacturing companies were considered in the conduct of the research; the following are general requirements to qualify for the total synopsis of the HR functions AI utilization.

Research Instrument

The researcher used a survey checklist. The instrument is categorized into three (3) parts, which are intended for HR personnel of the selected manufacturing companies in Calamba City. This aims to further justify the relevance of the existing approaches to human resources management processes used by the manufacturing companies.

Management and Treatment of Data

Proof of evidence gathered through the use of an onsite observation checklist collated and substantiate by interviewing the HR respondent from the manufacturing companies. All necessary information is recorded accordingly; assumptions for each source were disclosed in the data collection. The data gathered from the selected companies was used as a basis in the computation.

The researcher used relative frequency and percentage to determine the HR functions approach and the perceived level of effectiveness of the four (4) HR functions of the seven (7) manufacturing companies.

Results and Discussion

The aim of my research is to determine and recommend AI-driven tools, techniques, and procedures that will optimize Human Resources Department functions, focusing on Talent Acquisition, HR Analytics, Learning and Development, and Compensation Management to achieve optimization in HR processes for keeping HR personnel as a long-term solution to sustaining business growth and development.

AI-driven tools ensure continuity of the human resource management process which enable to continuously and consistently perform the managing of people, which doesn't need to be too dependent on HR personnel, who are difficult to immediately replace based on required qualifications and require time to learn HR functions.

My study's initial objective was identified HR approaches such as manual, semi-AI and advanced-AI for Human Resource functions and to perceived level of effectiveness among the HR approaches on the following Human Resource functions of the selected manufacturing companies in Calamba City focusing

on HR functions of Talent Acquisition, HR Analytics, Learning and Development and Compensation Management.

Discussion of Results: Statement of the Problem No. 1

The following identified HR functions manual approach are as follow:

1. Talent Acquisition: a) *Candidate selection*—Actual resumes provided are used to pick candidates for a specific position; the resume will be analyzed to assess the abilities and work experience required for the job vacancy, b) *Examination*—Candidates were assessed in person using a questionnaire and answer sheet, with a time limit. The answer sheet will be carefully examined, and the results will be discussed following the examination, c) **Interview**—A face-to-face interview follows the flow of the provided resume. The interview results will be reflected in the resume, which will include the interviewee's remarks and signature. The study's findings support the claim by Sutisoftblog (2025) that manual administrative tasks are a significant negative impact on HR operations. The time and effort required for these tasks can lead to missed opportunities, increased expenses, and a reduced focus on more strategic and productive work. This is particularly problematic in departments with high employee turnover.

2. HR Analytics: a) *Employee data*—HR personnel at seven (7) manufacturing companies use Excel spreadsheets to collect personal information such as date of hire, birthday, religion, education, and age. They filter the spreadsheet to find specific employee information, b) *Turnover rate*—HR personnel can manually compute the percentage of turnover rate based on the list of resigned, terminated, or abandoned personnel in Excel format, c) *Time to hire/fill-in* - An Excel spreadsheet for monitoring and reporting job vacancies allows users to determine the time required to hire and fill positions based on the date when position requirements are monitored.

The responses from the HR personnel align with a 2023 global study by the IBM Institute for Business Value (IBV). As detailed in Table 6, this study found that executives believe 40% of their workforce will require reskilling over the next three years due to the implementation of AI and automation. Executives see this change as a growth in employment opportunities. Indeed, 87% of respondents think that generative AI will likely enhance rather than replace staff responsibilities, with the effects differing based on job function.

3. Learning and Development: a) *Training needs analysis*—training analysis forms were given to every department or section to be filled out by the employees as a basis for the annual training plan, b) *Training program*—training programs are based on the results of the collated TNA forms. The training programs are in Word format, with some companies using color coding to monitor done, rescheduled, or pending training activities, c) *Feedback* – There is no feedback form presented during the onsite observation. However, during the interview, the way to get feedback is to actually give comments or suggestions after the training activities.

As supported by the results, AI provides numerous benefits to human resources, as documented by Schosser (2024). With the ever-evolving business landscape, staying competitive can be challenging. This is why artificial intelligence has become increasingly crucial in human resources, providing professionals with tools to offer scalable, immersive, and personalized training solutions for their teams.

4. Compensation Management: The study results indicated that six (6) out of seven (7) selected manufacturing enterprises in Calamba City used semi-AI (B) in their payroll system, which falls under the HR function of Compensation Administration. Six (6) manufacturing companies are implementing semi-AI in payroll by using a system module to generate time-in, time-out, and even break time and absences for their employees, which is connected or linked to their existing biometrics and has a built-in CCTV camera

to capture each employee's attendance. However, Company G, an auto parts manufacturer with five HR respondents, responded manually (A).

Based on the researcher's onsite observations and interviews with payroll and accounting personnel utilizing the payroll system module in selected manufacturing companies, AI can provide important insights to assist organizations in optimizing their compensation plans. AI tools may evaluate compensation data to identify trends, benchmarks, and patterns across roles and levels. The majority of respondents stated that the payroll process is time-consuming and complicated, with on-time payment and accurate salary and compensation computations being critical for every firm. Using a semi-AI payroll system increases their efficiency and output.

The process also enables organizations to set competitive, equitable pay rates that are consistent with market norms, as well as forecast future compensation needs based on projected headcount growth, budget constraints, and talent supply/demand dynamics in local labor markets, giving them an advantage over other manufacturing companies in Calamba City. For bonuses and salary structure, which are also part of the HR functions for Compensation Management, all seven (7) manufacturing organizations use a manual approach to determine the bonus rate for each employee. During the interview, HR personnel revealed that the bonuses were based on annual performance review forms. Only four (4) out of seven (7) manufacturing enterprises offer bonuses, and the other three (3) have had no incentive schemes since.

Discussion of Results: Statement of the Problem No. 2

The seven (7) selected manufacturing companies in Calamba City perceived the level of effectiveness on the current manual approach on HR functions for Talent Acquisition, HR Analytics and Learning and Development with low level of effectiveness due to tedious repetitive manual task that resulted inefficiency for HR respondents. However, the seven (7) manufacturing companies perceived the level of effectiveness for payroll system given a rating of moderate since they are currently utilizing a semi-AI in processing of payroll which is automatically link in the biometric system and payroll system module.

Table 1 shows that the overall level of effectiveness is moderate for the six (6) manufacturing companies regarding the payroll system under Compensation Management. Only one company, a part manufacturing company with 245 total employees, reported a mix of effectiveness levels: 60% of their responses fell into the low effectiveness category, while 40% were rated as having a moderate level of effectiveness.

During the interview, the 3 respondents (60%) who rated their experience as very low reported that they are not fully trained to use the payroll system because they are accustomed to the manual process from a decade ago. In contrast, the 2 respondents (40%) who belong to Generation Z are mostly recent graduates and newly hired; they rated their experience as moderate and appreciate the newly launched payroll system. According to the 3 HR respondents, the system is more efficient and convenient to use because the payroll process requires detailed transactions. The results show the need for HR functions optimization with the help of AI, are supported by a statement from Malik et al. (2021). Embracing the AI workspace can lead to improved employee satisfaction and better work-life integration, and Hmoud & Várallyai (2020) explain that it enhances overall productivity by taking over time-consuming and repetitive tasks of the HR team, enhancing the quality of the HR processes with neutralized biases.

The survey checklist indicated that responses from HR personnel regarding bonuses and salary structure were low. Upon further validation through on-site observations and interviews, the researcher confirmed that none of the seven manufacturing companies had an established salary structure or bonus system. They based the incentives on the manual performance appraisal, and the salary structure is based on the minimum

wage order for workers, and for the higher position, it depends on the additional skills, training, or accomplished improvement and cost savings.

Table 1. Compensation Management and the percentage of perceived level of effectiveness among the selected manufacturing companies in Calamba City, 2025





HR FUNCTIONS	Respondents	PERCEIVED LEVEL OF EFFECTIVENESS					Overall
		very low	low	moderate	high	very high	
D. Compensation Management							
1. Payroll System		7.7%		92.3%			
Company A	n=6			100%			moderate
Company B	n=6			100%			moderate
Company C	n=6			100%			moderate
Company D	n=7			100%			moderate
Company E	n=3			100%			moderate
Company F	n=6			100%			moderate
Company G	n=3		60%	40%			low
2. Bonuses and others		20.5%		79.5%			
Company A	n=6	33.3%	66.7%				low
Company B	n=6	16.7%	83.3%				low
Company C	n=6		100%				low
Company D	n=7		100%				low
Company E	n=3	66.7%	33.3%				very low
Company F	n=6	33.3%	66.7%				low
Company G	n=3	20%	80%				low
3. Salary structure		25.6%		74.4%			
Company A	n=6	33.3%	66.7%				low
Company B	n=6	16.7%	83.3%				low
Company C	n=6		100%				low
Company D	n=7	14.3%	85.7%				low
Company E	n=3	66.7%	33.3%				low
Company F	n=6	33.3%	66.7%				low
Company G	n=3	40%	60%				low
Overall		15.4%	53.8%	30.8%			low

Discussion of Results: Statement of the Problem No. 3




The researcher recommended that the seven manufacturing companies prepare for AI adoption by assessing specific AI applications, as detailed in Table 2. This assessment should align with their strategic goals for integrating AI into HR operations, with a particular focus on talent Acquisition, HR analytics. Learning and development, as well as compensation management, could help the seven (7) selected manufacturing companies expand and improve their businesses.

An awareness program roadmap for the following AI utilization is advised to optimize the HR functions to not totally rely on HR personnel and to increase the efficiency and productivity of HR personnel, which is the goal of the research study.




Table 2. List of future AI utilization recommendations for HR functions as part of business strategic plans for selected manufacturing companies in Calamba City, 2025

A. TALENT ACQUISITION		
AI Tools Name	What it can offer	How HR Can Use It
Hired Socre AI for Recruiting 	Analyzes workforce data to provide insights into employee turnover, engagement, and productivity.	Makes recruiters' jobs easier by automating the screening and shortlisting of candidates.
Fetcher 	AI tool that automates finding and reaching out to candidates.	Speeds up hiring by automatically finding and engaging top talent.
Attract AI 	AI tool that checks candidate data to predict success and tailor outreach.	Boosts hiring by providing insights into candidate fit and automating engagement.
Hire Vue 	AI platform for video interviews and assessments, analyzing responses to check candidate fit.	Improves screening by providing insights into candidate skills and cultural fit.




B. HR ANALYTICS

AI Tools Name	What it can offer	How HR Can Use It
Visier 	Analyzes workforce data to provide insights into employee turnover, engagement, and productivity.	Helps HR make data-driven decisions to improve workforce management.
Seek Out 	Offers insights into talent distribution, skill gaps, and workforce diversity.	Supports talent acquisition and retention strategies.
Chart Hop 	The platform enables users to create different scenarios based on various assumptions, such as hiring plans, attrition rates, and promotions.	This helps in forecasting the impact of different decisions on the workforce

C. LEARNING AND DEVELOPMENT

AI Tools Name	What it can offer	How HR Can Use It
Lingo 	AI-driven training platform that creates engaging, custom courses for mobile.	Develops personalized learning experiences to upskill employees.
Ed App 	AI-powered learning management system for creating and delivering training.	Designs interactive and personalized training content.
Dextego 	AI-assisted coaching platform for managers to improve interpersonal skills and provide feedback for teams.	Develops managers and teams effectively.

D. COMPENSATION MANAGEMENT

AI Tools Name	What it can offer	How HR Can Use It
Bamboo HR 	Comprehensive HR management software leveraging AI to simplify processes in payroll, benefits, and employee self-service.	Simplify payroll and benefits for employees.
Gusto 	AI-driven tools that combines payroll, HR, and benefits automation powered by AI, streamlining compliance and operational tasks.	Automated for more efficient payroll, benefits and salary structures of the company
Sage HR 	AI-enhanced HR software that automates critical processes such as attendance management and performance evaluations.	It provides efficiency and accuracy in managing day-to-day employees attendance and performance management.

Research Implications

Summary of Significant Findings

- The main focus of the study is the function of the human resources departments of selected manufacturing companies in Calamba City, specifically looking at how their HR personnel currently handle HR tasks. This phase includes examining Talent Acquisition, HR Analytics, Learning and Development, and Compensation Management. The study suggested AI-powered tools, methods, and practices that will improve HR functions and make them more in line with business needs. This will help the business grow and be successful in the future.
- The selected seven (7) manufacturing companies in Calamba City utilizing a manual approach, for Human Resource functions achieving Talent Acquisition, HR Analytics, Learning and Development, and Compensation Management.

- Six (6) out of seven (7) manufacturing companies in Calamba City is currently in Semi-AI approach when it comes to their payroll system and moderately satisfied.
- The thirty-nine (39) respondents from seven (7) manufacturing companies in Calamba City rated the existing of Human Resource functions focusing on talent acquisition, HR analytics, learning and development, and compensation management level of effectiveness to low level of effectiveness.
- There are thirteen (13) recommended HR functions and AI utilization for the selected manufacturing companies in Calamba City.

Conclusions

Most of the selected manufacturing companies in Calamba City are using a semi-AI approach for their payroll systems and are moderately satisfied with it, showing that it works well because it makes payroll processing much more efficient. To compete with other manufacturing companies, the seven (7) selected companies are investing in AI-driven tools to improve payroll processes, which are crucial for employees due to the intense competition in the industry.

The selected manufacturing companies prioritize on-time and correct payments to help their payroll workers and enhance employee morale, which is essential for keeping them employed. It is a worthwhile investment to implement automation in payroll processing because the headcounts of the selected manufacturing companies are constantly increasing. However, based on the information provided and on-site observations, HR functions such as talent acquisition, HR analytics, learning and development, and compensation management are currently manual, indicating a low level of effectiveness that requires improvement for the HR department's future strategic plans. The majority of respondents stated a desire for AI assistance to increase their work efficiency and productivity. Respondents find their daily HR responsibilities tedious and error-prone due to the manual approach, and the majority of time delays are caused by investing time and effort, which is detrimental for them and the company.

Recommendations

To realize the potential human resource's function and AI utilization for selected manufacturing companies in Calamba City, the following actions are suggested:

1. HR Managers should annually review their existing processes to determine their effectiveness. To ensure proper implementation of AI and other HR initiatives, they should first consult with top management to get approval. It's also recommended that companies with existing semi-AI systems consider incentive programs for HR personnel who effectively use these tools to improve their performance. In the short term, a yearly audit of current HR functions is advised. For the medium term, a yearly refresher course on AI-driven tools should be incorporated into the training program for HR personnel. As a long-term goal, managers should present a comprehensive AI roadmap, integrated into the overall HR strategic plan, during the yearly management review.
2. Top management should organize comprehensive seminars to ensure HR personnel are knowledgeable about using existing systems.
This is particularly important for companies with automated systems, as the study found that manual interventions remain dominant in Compensation Management. These seminars will enable HR staff to leverage current technologies effectively, making their tasks more efficient.
3. Future researchers are encouraged to conduct similar studies in other industries, such as BPOs, sales, and medical institutions, where the application of AI in HR is currently under-researched.

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