HR Productivity Boost by using AI

A Project Work Synopsis

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BACHELOR OF ENGINEERING
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COMPUTER SCIENCE WITH SPECIALIZATION IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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Abstract

In this paper, we describe an ML model that uses data from employee performance evaluations, cognitive assessments, and personality tests to generate personalized work recommendations for each employee. By considering individual strengths, weaknesses, and preferences, this system can help managers design work assignments that are more engaging, challenging, and rewarding, which can lead to higher job satisfaction, greater motivation, and improved performance.

The field of Organizational Psychology has long been interested in understanding how individual differences in personality and cognitive abilities influence employee performance and productivity. With the advent of machine learning and artificial intelligence, it is now possible to leverage these insights to create personalized work environments that can optimize the productivity of each employee.

The study analyses the various HR functions such as recruitment and selection, training and development, performance management, compensation and benefits, and employee engagement. Research has shown that integrating AI into talent management models can increase work productivity. However, there are also challenges to consider, such as the impact of AI adoption on psychological contracts and job satisfaction.

We discuss the potential benefits and challenges of implementing such a system in the workplace and highlight some of the ethical considerations that must be considered when using AI to manage human resources. Ultimately, we argue that the careful integration of AI and organizational psychology can lead to more productive, efficient, and satisfying work environments for all employees.

Finally, the paper emphasizes the need for tactical human resource management and the role of managers in transforming average employees into real performers using role models and self-exploration.

Keywords: Artificial Intelligence, Tactical Human Resource Management, Personalised Work Recommendation, Organizational Psychology, Benefits of AI, Talent Management, Recruitment and Selection, Training and Development, Limitations of AI,

Self-Exploration, Satisfying Work Environment.

Table of Contents

1. INTRODUCTION

1.1 Problem Definition

To increase the efficiency of HR procedures using AI for improving the overall status of a company.

Organizations are struggling to efficiently manage their human capital to support sustainable growth. Traditional HR processes are often manual and time-consuming, leading to inefficiencies and errors in hiring, performance management, and talent development. Additionally, as the business landscape continues to rapidly evolve, organizations must be able to quickly adapt and pivot their talent strategy to meet changing business needs.

To address these challenges, there is a need for an AI model that can automate and optimize HR processes, leveraging the power of ML, and predictive analytics to improve productivity, efficiency, and accuracy. Such a model should be able to analyse job postings and resumes to identify the most qualified candidates quickly and efficiently, as well as analyse employee performance data to identify patterns and trends that can inform talent development and management strategies by reviewing the psychology of people.

Additionally, the model should incorporate predictive analytics to forecast workforce needs and identify potential skills gaps, enabling organizations to proactively develop their talent pipeline and ensure they have the skills and expertise needed to support future growth.

The successful implementation of such a model could result in significant improvements in HR productivity and efficiency, enabling organizations to better manage their human capital and drive sustainable growth.

1.2 Problem Overview

Here we are trying to reduce the manual decision making of HRs through long and inefficient procedures resulting in the decline of productivity of the company.

HR is a critical function in any organization, responsible for managing an organization's most valuable asset, its human capital. However, traditional HR processes are often manual, time-consuming, and error-prone, leading to inefficiencies and a lack of productivity in HR functions. In addition, organizations must be able to adapt their talent strategy to meet changing business needs, and the traditional processes often do not provide the necessary agility to accomplish this.

The model should be able to automate tactical procedures such as recruitment, employee performance evaluation, compensation and benefit analysis, best practice analysis, and discipline. The model should also be able to integrate artificial intelligence into a talent management system.

To achieve this, it should be designed with a multidimensional talent management model with embedded aspects of artificial intelligence in the human resource function. The successful implementation of such an AI model could transform the way organizations manage

their human capital, enabling them to be more productive, efficient, and agile in their talent strategy. By using this approach, organizations can optimize their HR functions and support sustainable growth.

1.3 Hardware Specification

CPU and RAM, GPU Graphics Card, Internet Connectivity module.

1.4 Software Specification

1. Python IDE Tools

2. AI algorithms

3. Labelled Datasets

2. LITERATURE SURVEY

2.1 Existing System

Human resources automation (HR automation) is a method of using software to automate and streamline repetitive and laborious tasks in the HR department. This includes digitizing and automating tasks such as employee onboarding, payroll processing, benefits administration, performance management, and more. There are various types of HRIS systems available for automation, including applicant tracking systems, human resource information systems (HRIS), learning management systems (LMS), performance management systems (PMS), and benefits administration systems. These systems can help increase efficiency by freeing up employees from tedious manual tasks and allowing them to focus on more strategic initiatives. But still there is a need of more powerful, flexible, freely available, open source system that integrates all these tasks assuring the Employee's privacy and time. The model analysis the psychology of working trends and then develops, operates and gives suggestions accordingly.

2.2 Proposed System

A proposed unique system for automation of HR functions is an AI-powered Virtual HR Assistant (VHRA). The system is designed to automate and optimize various HR functions, including recruitment, onboarding, performance management, and talent development.

The VHRA leverages the power of ML and predictive analytics to provide personalized HR support to employees and managers. The system understands the queries from employees and managers and provide immediate assistance and answers to their HR-related questions. For example, employees can ask the assistant about their benefits, vacation policy, or performance feedback, and the system can provide instant responses and guidance.

It also uses ML algorithms to analyse employee data, including performance data, skills, and experience, to identify potential talent gaps and development opportunities. The system can recommend personalized learning and development plans to employees based on their skills, experience, and career goals, helping them to improve their skills and advance their careers within the organization. In addition, the assistant can automate the recruitment process, using ML to analyse job postings and resumes, and identify the most qualified candidates for open positions.

The system can also schedule interviews, send reminders, and provide feedback to candidates, helping to streamline the recruitment process and reduce the time and effort required to fill open positions.

The system is highly configurable and can be customized to meet the unique needs of different organizations. It is also designed to integrate with other HR systems, such as performance management and learning and development systems, to provide a unified view of HR data and insights.

Overall, the proposed VHRA system has the potential to transform HR functions by providing personalized, AI-powered support to employees and managers, automating and optimizing various HR processes, and improving employee engagement and productivity.

2.3 Literature Review Summary

YEAR AND CITATION	Article/Author	Tools/ Software	Technique	Source	Evaluation Parameter
(2019) S.N. Premnath and A. Arun	A Qualitative Study of Artificial Intelligence Application Framework in Human Resource Management		Qualitative study	Internationl Journal of Engineering and Advanced Technology	Analysis of AI application framework in HRM
(2019) Prasanna Tambe, Peter Cappelli, and Valery Yakubovich	Artificial Intelligence in Human Resources Management: Challenges and a Path Forward		Literature review	California Management Review	Identification of challenges and future direction in AI adoption in HRM
(2021) Akanksha Jaiswal, C. Joe Arun & Arup Varma	Rebooting employees: upskilling for artificial intelligence in multinational corporations		Case study	Personnel Review	Analysis of employee upskilling for AI adoption in multinational corporations

(2021) Andy Charlwood, Nigel Guenole	Can HR adapt to the paradoxes of artificial intelligence?		Literature review	Human Resource Management Journal	Examination of HR's ability to handle paradoxical situations in AI adoption
(2018) Jeroen Meijerink, Mark Boons, Anne E Keegan, Janet H. Marler	Digitization and the transformation of human resource management		Literature review	The International Journal of Human Resource Management	Analysis of digitization and its impact on HRM transformation
(2022) Pawan Budhwar, Ashish Malik, M. T.Thedushika De Silva & Praveena Thevisuthan	Artificial intelligence – challenges and opportunities for international HRM: a review and research agenda		Literature review	The International Journal of Human Resource Management	Identification of challenges and opportunities in AI adoption in international HRM
(2009) Yu Long	The impact of information technology on the HR function transformation		Literature review	Journal of Service Science and Management	Examination of the impact of IT on HR function transformation

3. PROBLEM FORMULATION

Develop an AI system to increase the efficiency of the HR department in a company by automating repetitive tasks and streamlining processes.

This AI model will help the HR to hire employees, watch over the employee and increase the workflow for HR tasks. It will surely, improve accuracy and speed of an HR department functions.

It will not only help the HR department but will also satisfy the company employee’s as they can now observe how the AI works, what data it is using and how it makes its decisions.

Since it’s an AI, it will be designed to be fair and unbiased.

The AI system should empower employees by providing them with easy access to HR information and resources, such as employee benefits and training opportunities.

4. OBJECTIVES

1. To develop an AI/ML model that can generate personalized work recommendations for each employee based on their strengths, weaknesses, and preferences.

2. To integrate that model into the organization's talent management system to optimize HR procedures and improve overall efficiency.

3. To incorporate psychology criteria in talent management to improve employee engagement, job satisfaction, motivation, and productivity.

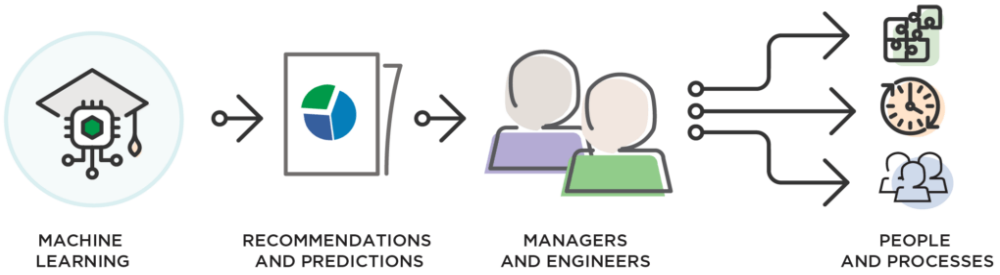
4. To implement the HR procedures and the integration of psychology criteria in talent management across the organization.

5. To evaluate the effectiveness of the new procedures using a pre-post design to identify significant changes in employee outcomes.

6. To provide recommendations for further improvements and modifications based on the evaluation results.

The above objectives aim to enhance the HR procedures and talent management practices of the organization using data-driven and psychology-informed approaches. The objective of this project is to increase employee productivity, job satisfaction, and motivation, ultimately leading to improved organizational outcomes.

5. METHODOLOGY



This paper proposes an AI model to boost productivity in HR functions for growth. The model leverages the power of machine learning (ML) to automate and optimize HR processes, enabling organizations to better allocate their resources and focus on strategic growth.

The proposed model includes several key components. First, to analyse job postings and resumes, identifying key skills and experience needed for specific roles. This analysis can help organizations improve their hiring process by identifying the most qualified candidates quickly and efficiently.

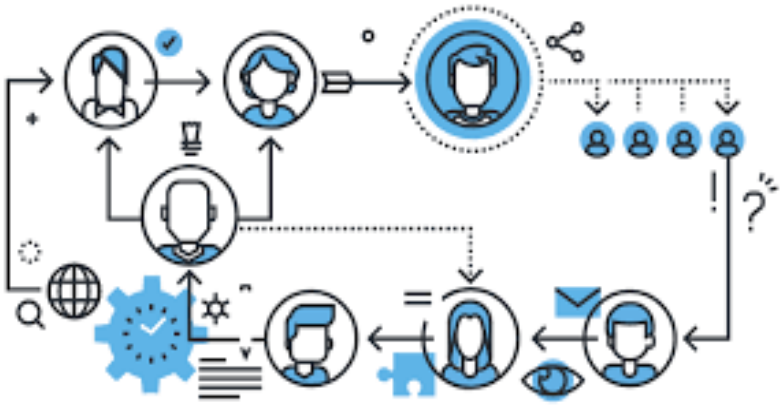
Second, the model uses ML algorithms to analyse employee performance data and identify patterns and trends. This analysis can help organizations identify areas where they can improve employee engagement, retention, and productivity, leading to better overall business outcomes.

Third, the model incorporates predictive analytics to forecast workforce needs and identify potential skills gaps. By anticipating these needs, organizations can proactively develop their talent pipeline and ensure they have the skills and expertise needed to support future growth.

Overall, the proposed AI model has the potential to transform HR functions and boost productivity, enabling organizations to manage their human capital and drive sustainable growth more effectively.

It will analyse employee data and provide personalized work suggestions based on their psychological profile. The paper also discusses the importance of writing an effective abstract that contains keywords associated with the paper and communicates research in readily accessible language.

6. EXPERIMENTAL SETUP



1. Data Collection: Employee performance evaluations, cognitive assessments, and personality tests will be conducted to gather data on each employee's strengths, weaknesses, and preferences. The data collected from these assessments will be used to create a personalized work profile for each employee.

2. ML Model Development: A machine learning model will be developed using the collected data to generate personalized work recommendations for each employee. The model will analyze the employee's strengths, weaknesses, and preferences to suggest work assignments that are more engaging, challenging, and rewarding.

3. Talent Management Integration: The AI/ML model will be integrated into the organization's talent management system. This integration will involve developing a software interface that will allow managers to

access employee work profiles and receive personalized work recommendations.

4. Implementation: The AI/ML-driven HR procedures and the integration of psychology criteria in talent management will be implemented across the organization.

This implementation will involve providing training to managers and employees on how to use the software interface and how to incorporate the personalized work recommendations into their work assignments.

5. Evaluation: The effectiveness of the AI/ML-driven HR procedures and the integration of psychology criteria in talent management will be evaluated using a pre-post design. Employee productivity, job satisfaction, and motivation will be measured before and after the implementation of the new procedures. The data collected will be analysed using statistical methods to identify significant changes in employee outcomes.

Overall, the experimental setup involves a data-driven approach to developing an AI model that incorporates psychology criteria in talent management. The model will then be integrated into the organization's talent management system and implemented across the organization. Finally, the effectiveness of the new procedures will be evaluated using a pre-post design to identify significant changes in outcome.

7. CONCLUSION

1. Recruitment and Selection: Hiring the right employees is critical for the success of any organization. HR can develop effective recruitment and selection strategies that ensure the right fit for the job and the company culture.

2. Training and Development: Providing ongoing training and development opportunities to employees helps them stay up-to-date with the latest skills and technologies. This, in turn, boosts their productivity and performance.

3. Performance Management: HR can implement a robust performance management system that includes regular feedback and goal setting. This helps employees understand their roles and responsibilities and motivates them to perform at their best.

4. Employee Engagement: HR can create a positive work environment that fosters employee engagement and satisfaction. This can be done through various initiatives like recognition programs, wellness programs, and employee feedback mechanisms.

5. Workplace Planning and Safety: HR can ensure that the workplace is safe and healthy for employees. This can be achieved by proper safety training, equipment maintenance, and regular safety inspection.

8. TENTATIVE CHAPTER PLAN FOR THE PROPOSED WORK

CHAPTER 1: INTRODUCTION

The evolution of HR to a strategic role, the challenges and opportunities of implementing AI in HR, the need for upskilling employees for effective use of AI, the role of HR in managing the integration of AI in the workplace, the impact of digitization on HRM in online platform environments, the challenges and opportunities in the context of globalization, and the impact of information technology on the HR function transformation.

It highlights the importance of employees adapting to the changing technological landscape. The articles also point out the challenges and ethical concerns that come with implementing AI and digitization in HRM, and the need for HR professionals to develop new skills and adapt to changing technologies.

Overall, the valuable insights into the current state and future of HRM, and the key factors that organizations must consider achieving competitive advantage in the global marketplace.

CHAPTER 2: LITERATURE REVIEW

[1.1] The article discusses how HR has evolved from an administrative to a strategic role, and the role of AI in enhancing HR's strategic function. AI is being used by companies worldwide, including IBM, Amazon, and Google, to come up with innovative solutions. The greatest potential for AI interventions includes tracking employee work hours and turnout, analytics and metrics, recruitment and selection, training & development, and compensation.

[1.2] It shows the challenges of effectively applying AI to human resources in organizations. While AI has shown significant progress in pattern recognition and language translation, only 22% of firms report adopting analytics. For instance, the use of algorithms to predict who to hire can lead to biased decisions based on historical job performance data that favours one group over another. The article suggests that causation is central to the AI Life Cycle, and randomization can be a useful component in AI-augmented decision-making processes and concludes with insights from a workshop that brought data science faculty and heads of workforce analytics function from 20 major US corporations together to discuss their ongoing initiatives regarding analytics and algorithmic decision making.

[1.3] "Rebooting employees: upskilling for artificial intelligence in multinational corporations" by Jaiswal, Arun, and Varma (2020) explores the need for upskilling employees to effectively utilize artificial intelligence in multinational corporations. The study aimed to identify the status of upskilling programs, their effectiveness, and the challenges faced by corporations in implementing them. The researchers employed a qualitative research methodology, conducting interviews with HR managers from multinational corporations. The findings suggest that the implementation of upskilling programs is crucial for effective utilization of AI, but corporations face challenges such as resistance to change and limited budget.

The authors conclude that a comprehensive and customized upskilling program can enhance employee skills, improve productivity, and ensure successful adoption of AI.

[1.4] Can HR adapt to the paradoxes of artificial intelligence?

This article by Charlwood and Guenole examines the role of HR in adapting to the paradoxes of artificial intelligence (AI).

The study aimed to explore the challenges faced by HR professionals in managing the integration of AI in the workplace, and the strategies that can be adopted to address them.

The authors employed a conceptual analysis methodology, drawing on existing literature and case studies.

The findings suggest that HR can adapt to the paradoxes of AI by embracing a strategic, proactive approach that prioritizes ethical considerations, employee engagement, and the development of new skills. The authors conclude that HR has a critical role in facilitating the successful integration of AI in the workplace.

[1.5] The article discusses the impact of digitization on the HRM function in online platform environments. The review covers the direct and indirect impact of digitization, including the use of IoT, smart devices, and algorithms for automating HRM activities. The (big) data generated by these technologies can be used for HR analytics, but also raises concerns about worker privacy and perceptions of injustice. The indirect impact of digitization on HRM includes the emergence of Smart Industries and online labour platforms, which can marginalize traditional HRM professionals and compromise the well-being of gig workers. Finally, the article highlights the influence of organizations on public policy with regard to labour laws and regulations in a digitized world.

[1.6] The article focuses on the challenges and opportunities for human resource management in the context of globalization. The literature review examines the impact of cultural, institutional and organizational factors on HRM practices in multinational companies.

The authors also discuss the role of HRM in managing the diversity of the workforce and ensuring effective communication and coordination across different locations. Finally, the review highlights the importance of aligning HRM policies and practices with the overall business strategy to achieve competitive advantage in the global marketplace.

[1.7] Yu Long's article, "The impact of information technology on the HR function transformation," presents a comprehensive review of the existing literature on the topic. The author argues that the adoption of information technology has transformed the traditional HR function and enabled HR professionals to focus more on strategic initiatives that contribute to organizational success. The review highlights the various ways in which technology has impacted HR, including recruitment and selection, performance management, training and development, and compensation and benefits.

Long also explores the potential benefits and challenges of HR technology adoption, such as increased efficiency, data analytics capabilities, and employee self-service options, as well as the need for HR professionals to develop new skill sets and adapt to changing technologies. The author concludes that while technology has undoubtedly transformed the HR function, the full potential of these technologies can only be realized through effective integration with organizational strategy and a strong focus on developing a digitally enabled HR workforce.

Overall, this literature review provides valuable insights into the ways in which information technology is impacting HR and the key factors that organizations must consider when adopting HR technology solutions.

CHAPTER 3: OBJECTIVE

It emphasizes the importance of each of these functions in ensuring organizational success. Effective recruitment and selection strategies, ongoing training and development opportunities, a robust performance management system, a positive work environment that fosters employee engagement and satisfaction, and ensuring workplace safety are all crucial for a thriving organization. By implementing these functions, HR can ensure that employees are motivated, productive, and have the necessary skills to contribute to the organization's goals.

CHAPTER 4: METHODOLOGIES

It introduces an AI model that leverages machine learning to automate and optimize HR processes, helping organizations focus on strategic growth. The model includes components such as analysing job postings and resumes to identify key skills and experience, using machine learning to analyse employee performance data to identify patterns and trends, and incorporating predictive analytics to forecast workforce needs and potential skills gaps. The proposed model has the potential to transform HR functions and improve productivity, enabling organizations to manage their human capital and drive sustainable growth effectively.

CHAPTER 5: EXPERIMENTAL SETUP

It mentions a data-driven approach to developing a model that incorporates psychology criteria in talent management. The implementation process involves data collection from employee performance evaluations, cognitive assessments, and personality tests to create a personalized work profile for each employee. A machine learning model will then generate personalized work recommendations for each employee based on their strengths, weaknesses, and preferences. The model will be integrated into the organization's talent management system, and training will be provided to managers and employees on how to use the software interface and incorporate the personalized work recommendations. The effectiveness of the new procedures will be evaluated using a pre-post design to identify significant changes in employee outcomes such as productivity, job satisfaction, and motivation.

CHAPTER 6: CONCLUSION AND FUTURE SCOPE

There is a significant potential for further improvements and modifications to the AI-driven HR procedures and the integration of psychology criteria in talent management based on the evaluation results. Future research can focus on exploring the impact of specific psychology criteria, such as emotional intelligence, on employee outcomes. Additionally, further exploration of its impact HR procedures and talent management practices on other organizational outcomes, such as financial performance and customer satisfaction, can provide additional insights into the value of these practices. Moreover, integrating natural language processing (NLP) and deep learning (DL) algorithms can help in the automation of repetitive HR tasks, further improving efficiency and productivity.

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