

**HUMAN RESOURCES DATA ANALYSIS FOR DECISION MAKING: THE USE OF DATA ANALYTICS AND ARTIFICIAL INTELLIGENCE (AI) IN FORECASTING HUMAN RESOURCE TRENDS, TALENT MANAGEMENT, AND EDUCATOR PERFORMANCE**

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**ABSTRACT**

*This research explores the utilization of data analytics and artificial intelligence in strategic decision-making for educational human resource management. Employing a qualitative approach through library research methodology, this study analyzes literature from internationally indexed journals, books, and relevant research reports. Findings reveal that implementation of predictive analytics and machine learning algorithms enhances the accuracy of educator demand forecasting by 35 percent, talent management efficiency by 60 percent, and performance productivity by 32 percent. Analytical technology enables educational institutions to make evidence-based decisions in recruitment, professional development, and performance evaluation. However, implementation in Indonesia faces challenges including technological infrastructure limitations, digital competency gaps, and organizational cultural resistance. Gradual adoption strategies with capacity development investments, multi-stakeholder collaboration, and supportive institutional policies become key success factors for digital transformation. This research contributes to technology-based human resource management literature within the Indonesian educational context.*

*Keywords: data analytics; artificial intelligence; human resource management; educator performance.*

## **INTRODUCTION**

The era of digital transformation has brought fundamental changes in human resource management in various educational institutions (Iswandi, 2024). Strategic decision-making related to educators can no longer rely on intuition alone, but instead requires a comprehensive data-driven approach. The development of information technology opens up opportunities for organizations to collect, process, and analyze personnel data on a massive scale. Utilization Artificial Intelligence and predictive analytics are important instruments in identifying patterns, predicting trends, and optimizing talent management strategies. However, the implementation of this technology in the education sector still faces various challenges, ranging from limited infrastructure to the competence of human resources in utilizing analytical systems. The gap between the potential of technology and field practice demonstrates the urgency of in-depth research on the application of data analytics in the context of educational human resource management (Nugroho, 2025).

This research seeks to answer several fundamental questions related to the optimization of decision-making in the field of educational human resources. First, how data analysis can be used to forecast future trends in educator needs and development. Second, the extent of the implementation Artificial Intelligence Able to improve the effectiveness of talent management in identifying potential, allocating tasks, and designing professional development programs. Third, how the integration of analytics technology can measure and improve educator performance objectively and sustainably. Fourth, what are the obstacles and challenges faced by educational institutions in adopting an artificial intelligence-based data analysis system. Fifth, how to design an implementation model that is in accordance with the specific characteristics and needs of educational organizations in Indonesia. The formulation of this problem is the basis for a systematic exploration of the role of technology in the transformation of human resource management (Veronika & Radian, 2024).

This research aims to explore and analyze the use of data analysis technology and Artificial Intelligence in the context of strategic decision-making in the field of human resources education. Specifically, this study is intended to identify effective data analysis methods and techniques in predicting trends in educator needs, rotation patterns, and staffing dynamics. In addition, this study seeks to evaluate the application of artificial intelligence systems in talent management, including the recruitment process, competency development, and succession planning. Another goal is to review the implementation Dashboard analytics for monitoring educator performance real-time and evidence-based. This research also intends to formulate practical recommendations for educational institutions in adopting analytics technology in accordance with the capacity and context of the organization. Thus, this research is expected to make a theoretical and practical contribution to the development of data-based human resource management systems (Hasnida & Adrian, 2024).

The results of this research are expected to make a significant contribution to the theoretical and practical level in the field of educational human resource management. Theoretically, this research enriches the treasure of literature on the application of analytical technology and artificial intelligence in the context of Indonesian educational organizations. The research findings can serve as an academic reference for the development of data-driven talent management models and conceptual frameworks. On the practical aspect, this study provides implementation guidance for stakeholders in designing a decision-making system that is more objective, efficient, and responsive to change. Educational institutions can utilize research recommendations to optimize resource allocation, increase educator job satisfaction, and ultimately improve the quality of learning. For policymakers, this research offers strategic insights in formulating regulations and standards related to the digitization of personnel management in the national education sector (Dan et al., 2024).

## **RESEARCH METHODS**

### **Approaches and Types of Research**

This study adopts a qualitative approach with the library research method or literature study as a strategy for data collection and analysis. This approach was chosen because of its ability to explore complex phenomena in depth through a comprehensive literature review. This type of research is descriptive-analytical which aims to describe and critically analyze various concepts, theories, and empirical findings related to the application of data analysis and artificial intelligence in educational human resource management. Literature research allows researchers to synthesize a variety of theoretical and practical perspectives from reliable sources. This method also provides flexibility in identifying patterns, trends, and knowledge gaps that exist in the literature. With a

qualitative approach to literature, this research can produce a holistic understanding of the implementation of analytical technology in the context of strategic decision-making in the field of educational personnel.

### **Data Sources and Data Collection Techniques**

The data sources of this study include primary and secondary literature relevant to the themes of data analysis and artificial intelligence in human resource management. Primary data was obtained from Scopus, Web of Science, and Google Scholar-indexed scientific journals published in the last ten years to ensure the novelty of information. Secondary sources include textbooks, research reports, proceedings of international conferences, and policy documents from educational institutions and international organizations. The data collection technique is carried out through systematic tracing using specific keywords such as "HR analytics", "predictive modeling", "talent management", and "educational workforce". The literature selection criteria include the relevance of the topic, the author's credibility, the methodology used, and theoretical or practical contributions. Documentation is done in a structured manner using a reference management application to ensure traceability and ease of analysis. This process results in a rich and diverse database of literature for in-depth analysis.

### **Data Analysis Techniques**

The data analysis in this study uses the content analysis method or content analysis with a thematic approach to identify the main patterns, themes, and concepts of the collected literature. The initial stage of analysis includes close reading of all sources to understand the substance and arguments presented. Furthermore, coding is carried out to categorize information based on key dimensions such as data analysis methods, artificial intelligence applications, talent management strategies, and educator performance indicators. The synthesis process is carried out by comparing and contrasting findings from various sources to identify convergence and divergence of perspectives. Source triangulation is used to validate the interpretation and improve the credibility of the analysis results. The final stage is the preparation of an integrative narrative that connects the various findings into a coherent and comprehensive framework of understanding of the phenomenon being studied.

## **RESULTS AND DISCUSSION**

### **Results**

#### **Utilization of Data Analysis in Forecasting Educational Human Resources Trends**

The results of the literature review show that the implementation of data analysis in forecasting educational human resource trends makes a significant contribution to strategic decision-making. Technique Predictive Analytics that makes use of algorithms Machine Learning such as Regression Analysis, Time Series Forecasting, and neural networks Able to predict the needs of educators based on demographic variables, retirement patterns, and projected student growth. Analysis of historical staffing data allows institutions to identify turnover patterns, retention rates, as well as factors that influence educators' decisions to stay or leave the organization. Analytics-based system Big Data It can integrate information from various sources such as staffing data, academic performance, and job satisfaction evaluations to produce more accurate projections. Studies show that educational organizations that implement a data-driven approach experience up to 35 percent increased efficiency in recruitment planning and up to 28 percent reduction in employee turnover costs compared to conventional methods (Suwandita et al., 2023).

#### **Application of Artificial Intelligence in Educator Talent Management**

Artificial intelligence has revolutionized talent management practices by providing automated and objective systems in various aspects of human resource management. Algorithm AI such as Natural Language Processing It is used to analyze resumes, cover letters, and candidate profiles in the recruitment process, thereby reducing subjective bias and speeding up to 60 percent more efficient selection. A machine learning-based recommendation system is able to identify individual professional development needs by analyzing educators' performance patterns, competencies, and career paths. Platform AI-powered such as Learning Management Systems Integrated provides personalized training programs based on the specific needs of each educator. Implementation Chatbot Smart in human resources services improves the accessibility of personnel information and reduces administrative burden by up to 40 percent. Sentiment analysis using natural language

processing also helps measure educator satisfaction and engagement levels through automated surveys and internal communication analysis (Sains et al., 2025).

### **Measurement and Performance Improvement of Educators Based on Analytics Technology**

Analytics technology offers an innovative approach to measuring and improving educator performance through a comprehensive, evidence-based monitoring system. Dashboard Business Intelligence Integrated visualization of key performance indicators such as learning effectiveness, student engagement, research publications, and community service contributions real-time. Multivariate analysis allows the identification of the factors that have the most influence on learning success, such as teaching methods, technology use, and interaction with learners. The technology-powered 360 degree feedback system collects evaluations from various stakeholders automatically and generates comprehensive reports. Application Learning Analytics Help educators understand learners' learning patterns and adapt pedagogical strategies adaptively. Studies show that the use of performance analytics systems increases educator productivity by 32 percent and student satisfaction by 27 percent through targeted and objectively data-driven interventions (Anastassia et al., 2023).

### **Challenges and Strategies for Implementing Analytics Systems in the Context of Indonesian Education**

The implementation of data analysis and artificial intelligence systems in education human resource management faces various contextual challenges in Indonesia. The limitations of information technology infrastructure, especially in regional educational institutions, hinder the adoption of analytics systems that require adequate connectivity and computing capacity. The digital competency gap among human resource managers is a significant obstacle in utilizing analytics platforms optimally. Resistance to change and preference for conventional methods are still strong in the culture of traditional educational organizations. The issue of privacy and security of personnel data requires clear regulations and a robust protection system. An effective implementation strategy includes a phased approach starting from Pilot Project Small-scale, investment in human resource capacity building through intensive training, collaboration with technology providers for affordable solutions, and the establishment of institutional policies that support digital transformation. An inclusive approach that involves all stakeholders from the planning stage is the key to successful technology adoption in the context of educational organizations (Sinaga et al., 2024).

### **Discussion**

The research findings reveal that the integration of data analytics and artificial intelligence in educational human resource management is creating a new paradigm in strategic decision-making. The transformation from an intuitive approach to an empirical evidence-based system allows educational institutions to optimize resource allocation more precisely (Satwika, 2024). Usage Predictive Analytics not only improving the accuracy of forecasting educator needs, but also identifying risk factors that affect employee retention. The implementation of analytics technology provides a competitive advantage in attracting and retaining quality talent through a responsive and personalized management strategy. However, successful implementation is highly dependent on the readiness of the technology infrastructure, the competence of managers, and the organizational culture that supports innovation. The gap between the potential of technology and the reality of implementation on the ground shows the need for an adaptive approach that considers the specific context of Indonesian educational institutions. Application Artificial Intelligence In talent management, it has significant implications for operational efficiency and the objectivity of the staffing process.

Automation in professional recruitment, selection, and development reduces human bias while accelerating decision-making. A recommendation system based on machine learning algorithms is able to provide personalized career development paths according to the individual competencies and aspirations of educators. Usage Learning Analytics in measuring performance provides constructive and objective data-based feedback, thereby increasing educator accountability and motivation. However, there are concerns related to ethical aspects such as data privacy, algorithm transparency, and the potential for a reduction in the humanist dimension in personnel interactions. The balance between technological efficiency and human values is a crucial challenge that requires comprehensive

policies and regulations to protect the rights of educators. An effective implementation strategy requires a holistic approach that synergistically integrates technological, human, and organizational aspects. Investment in digital capacity building through continuous training is an important prerequisite to ensure human resource managers can make optimal use of analytics systems. Gradual adoption with Pilot Project allowing institutions to make adjustments and learning prior to full-scale implementation. Collaboration with technology providers and other educational institutions can reduce investment costs and speed up the learning curve. The establishment of an integrated digital ecosystem includes infrastructure, policies, and organizational culture that supports innovation. In the Indonesian context, an inclusive approach that involves all stakeholders and considers the diversity of conditions of educational institutions is the key to the success of digital transformation in human resource management (Rahman et al., 2025).

## CONCLUSION

This study emphasizes that the use of data analysis and Artificial Intelligence In human resource management, education makes a substantial contribution to improving the quality of strategic decision-making. Implementation Predictive Analytics and machine learning technology enables more accurate forecasting of staffing trends, more efficient talent management, and objective and comprehensive measurement of educator performance. While the potential of analytics technologies is promising, successful implementation depends on infrastructure readiness, human resource competence, and institutional policy support. Implementation challenges in Indonesia include digital divides, resistance to change, and data privacy issues that require a gradual and inclusive adoption strategy. Digital transformation in educational personnel management is not just the application of technology, but a fundamental change in organizational culture towards data-driven and evidence-based systems to achieve sustainable competitive advantage.

## ACKNOWLEDGEMENTS

Praise be to the author for the presence of Allah SWT for all His graces and gifts so that this research can be completed properly. The completion of the research with the title "Human Resources Data Analysis for Decision Making: The Use of Data Analytics and Artificial Intelligence (AI) in Forecasting Human Resource Trends, Talent Management, and Educator Performance" cannot be separated from the support and contributions of various parties. The author would like to express his deepest gratitude to the University of PGRI Palembang for providing support and facilities in the implementation of this research. The author conveys his high appreciation to his colleagues and colleagues who have provided constructive input and academic discussions that enrich the perspective of this research. The author also expressed his gratitude to the researchers and academics whose work became an important reference in this literature study. Their contribution to the development of science in the field of technology-based human resource management is a valuable foundation for this research. The author realizes that this research still has limitations and can be developed further. Therefore, constructive criticism and suggestions from readers are highly expected for further research improvement. Hopefully this research can provide benefits for the development of educational human resource management in Indonesia, especially in the context of digital transformation.

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