# A CONTENT ANALYSIS ON ARTIFICIAL INTELLIGENCE AT THE SERVICE OF HUMAN RESOURCES MANAGEMENT

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## Abstract

The analysis of data pertaining to human resources has drawn the attention of all businesses in recent years, and the emphasis has been placed on human capital, which is regarded as the primary factor influencing the development of the business and all of its activities at all levels of human resource policies. Throughout the coming years, data analysis (HR analytics) will dramatically increase firm profitability. We began by conducting a thorough analysis of the various risks and issues related to human resources that HR specialists had reported. Next, we looked at the most recent research on computer science techniques that were suggested as solutions, before concentrating on potential artificial intelligence techniques. By describing the IT solutions already implemented in human resources for the years between 2008 and 2018, this review article will serve as an archive and a reference for computer scientists working on HR. It tries to clearly outline the problems that computer scientists are working to address for HR researchers. By emphasising those that use artificial intelligence, it simultaneously outlines the many and modern IT approaches, tools, and methodologies now in use.

Keywords: Human Resources Management, Artificial Intelligence, Motivation, Skill Management

## Introduction

As a result of the diversification of challenges pertaining to the HR function and the growth of its impact over corporate strategic decision-making processes, human resources management has experienced significant changes. The HR function is currently evolving more and more in the direction of individualised HR practises that take into consideration the unique characteristics of each target. The objective is to support managers in improving intergenerational collaboration. In order to make the best decisions and enhance operational performance, businesses can use their "employee" databases effectively through the use of human resources analysis.

Artificial intelligence based on "machine learning" technology promises to revolutionise human resources departments at various levels, including recruitment, training, career management, mobility, compensation, and perks in an effort to draw in talent and high potential, treat and analyse nominations as quickly as possible, check the applicability of the profile and position, and more at a time when business leaders are trying to prepare for a digital world that is gaining momentum. Losing one or more of its successful employees to one of its rivals is one of the most challenging situations for any business that wishes to be modern and competitive. Artificial intelligence allows HRDs to create human capital performance indicators that are based on internal data analysis and cross-referenced with information from the external market, particularly competition. It will be feasible to map the current profiles in accordance with each employee's productivity and effectiveness using the findings of these investigations. This technology, which is undergoing a technical boom and is rapidly producing convincing results among the industry's titans, is inspired by how the human brain functions (Apple, Facebook, Google, Microsoft ...).

To get the most out of it, it is necessary to learn and analyse how data is treated. The HR function will be able to capitalise and elevate its function to a higher strategic and decisional level on the basis of this reflection and its intuition. Some people might believe that data and algorithms can take the place of their decision-making intellect, but in reality, they only allow for a more effective manifestation of that intelligence. It is crucial to comprehend that data is not autonomous if it becomes inevitable. The reading and

interpretation of this data by human intelligence is where all of its worth rests. Data is at HR's disposal; it does not substitute their wisdom and bravery. The data gives HR the foundation they need to construct their future. The difficulty that comes along with the taming of data by HR is challenging pre-made representations and preconceived assumptions to induce proposals based on these observations.

## Literature Review

Some scholars have successfully finished their work on human resources analytics over the past few years. We have decided to compile the many studies conducted on this topic between 2008 and 2018. Newspapers published the majority of their articles from 2015 to 2018, particularly between 2015 and 2017. These articles mostly dealt with issues pertaining to the fields of artificial intelligence and human resources. During the months of March and September and in the month of November of last year, there were more research projects involved.

A large number of articles have been published in computer science-related journals like Future Generation Computer Systems, International Journal of Interactive Multimedia and Artificial Intelligence, International Journal of Computing and Informatics, The Scientific World Journal, etc., while others have been published in journals that focus on human resources management, like Management: Journal of Contemporary Management Issues, Journal of Business Strategy, Business Hour From 2008 to 2018, the quantity of HR papers increased exponentially.

## Human Resources Risks

3.1. The Social Dialogue: A failure in the management of social dialogue due to poor communication or lack of clarity in managerial goals can lead to intense tensions inside the organisation, even a protracted strike (absenteeism, demotivation, lack of trust between managers and employees ...). Forecast: Additional Strikes/Absenteeism Rate.

3.2. Skills Management: A lack of follow-up on the company's skills and abilities results in a systematic exacerbated exodus of important workers, as well as increased staff demotivation, a lack of training, and team stagnation. Attrition rate and assisted awareness rate to be predicted.

3.3. Well-Being and Motivation at Work: Certain managerial practises, such as the establishment of impossible goals and the lack of communication between managers and staff, can be thought of as stressors that lead to employee burnout, stress, or even suicide. Forecast: Employee Engagement/Staff Satisfaction.

3.4. Employee safety: If safety protocols are not formalised and there is no internal control in this area, the company could face legal and/or criminal consequences as a result of workplace injuries or even fatalities (degradation of his image). Operational hazards associated with the company's activity are anticipated.

3.5. "Horrific" HR Procedures: An insensitive management system based on excessive pressure from management (pressure on targets) and a lack of internal control over managerial actions may result in a disastrous social climate (harassment of staff, unequal treatment of situations). Predict: Social climate assessment indicators.

3.6. HR Costs: Poor payroll management, expensive health insurance and provident insurance are just a few examples of how a lack of control over HR costs can result in additional expenses and a structural increase in management costs. Predict: HR management control improvements and cost-controlling indicators.

## It Solutions and Artificial Intelligence for Human Resources Problems

4.1. The Different HR Issues Studied

Our research indicates that computer scientists have been tasked with solving a number of HR-related problems. The majority of the problems raised relate to: Employment, talent and skill management, candidate/staff selection and recruitment, attrition, turnover, future needs for human capital, HR performance and effectiveness, etc. The key HR concerns that have been brought up and for which computer scientists have suggested various IT solutions are displayed in the following graph.

4.2. IT Solutions for Human Resources Issues

Our quantitative analysis indicates that a number of IT solutions have been suggested to address the various human resources-related issues. Our thorough investigation revealed that the artificial intelligence algorithms (Machine Learning, Neural Network, and Data Mining) are the ones most frequently employed to address HR issues. They are used more frequently than the others (41%), with simple statistics or other analytical methods coming in second (29%), BI, Big Data, and data warehouse solutions coming in third (14%), and simple analysis utilising software, ERP, frameworks, or websites coming in fourth (16%).

4.3. Artificial Intelligence Solutions for Human Resources Issues

The science that deals with the development of human knowledge and gives robots the ability to mimic human reasoning and intelligence is known by the abbreviation AI. It simulates the performance of tasks similar to those carried out by humans, including identification, forecasting, categorization, comprehension, discourse, adaptation, and learning. Artificial intelligence is currently a hot topic in the virtual world across all industries. Since its inception, it has undergone a renaissance in the form of Machine Learning and then the emergence of Deep Learning, which has boomed in recent years, giving Machine Learning a new type with more in-depth examples and algorithms. Furthermore, given their significance in all of the previously listed significant elements, we are unable to discuss these concepts without bringing up neural networks, which serve as the foundation of our research.It follows that the need for IT solutions for HR-related problems is growing. Several strategies have been put up by scientists to address these HR issues. The use of artificial intelligence is not unusual. It also provides many algorithms and techniques.

Our quantitative analysis indicates that a number of IT solutions have been suggested to address the various human resources-related issues. Many applications of artificial intelligence have been made, utilising various techniques and algorithms. The most popular artificial intelligence algorithms that have been applied are Decision Tree, Random Forest, Support Vector Machine, Multi-Layer Perceptron, K-Nearest Neighbour (KNN), Gaussian Nave Baye, Logistic Regression, C4.5 method, and others. The most popular artificial intelligence algorithm is the decision tree, which is utilised 30% of the time, followed by SVM (17%), Random Forest (17%), 15% for Logistic Regression, 11% for KNN, 4% for MPL, and C 4.5 (4%), and 2% for Nave Bayes.

**Conclusion**

As a result of our research on the two axes of human resources and artificial intelligence, we were first able to identify the various concerns voiced by the experts and managers in the field and then focus on the most prevalent challenges. We have made an effort to compile all answers to problems that scientists and computer scientists have come up with, especially those that make use of artificial intelligence techniques between 2008 and 2018. Based on the number of papers we identified, we deduced that numerous HR Analytics were suggested, and the majority of them utilised artificial intelligence algorithms and approaches. This indicates the technology's quick development, observed growth, and growing interest and rivalry in the HR industry.

Recruiting, Skills Management, Human Resources Development (workers' abilities, effectiveness, productivity, and performance), attrition, and turnover were the HR questions that were asked the most regarding analysing and predicting. Some of the known software, frameworks, and ERP (SAP, SPSS, Oracle, SAS, CRM, SMA, SNW) and Artificially Intelligent algorithms (Machine Learning, Neural Network, Deep Learning...) were mentioned in the proposed solutions. Others used or suggested other analysis methods and simple statistical data combined with HR analysis and HR approaches. Decision Tree (DT), Random Forests (RF), the Support Vector Machine (SVM), Multi-Layer Perceptron (MLP), K-Nearest Neighbour (KNN), Gaussian Nave Bayes (GNB), Logistic Regression (LR), and C4.5 were the most widely utilised artificial intelligence techniques.The field of human resources is broad and expanding all the time. Each firm is concerned with managing its human resources

by viewing human capital as the foundation of success and the source of growth in order to boost productivity, draw in talent, and retain customers in order to successfully compete. On the reverse hand, the field of intelligence is constantly developing, and fresh ideas and techniques are constantly being put out.

**Acknowledgement:**

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