

## Analytical Human Resources: A Path Towards Business

### Intelligence

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**Abstract**— The purpose of this research is to find the different Human Resources analytics as an aspect of Business Intelligence for efficient and structured HR issue management. This article also discusses the significance of business intelligence in the realm of human resource management (HRM) by utilizing various established BI models such as SAS Human Capital Predictive Analytics, SAP ERP Workforce Analytics, and Retention Modeling, IBM Cognos, and Oracle Human Resources Analytics. The research focuses on how various BI models aid in achieving long-term business success by strategically aligning HR challenges with overall business goals. The research takes a descriptive approach. The published publications are being evaluated (mostly from EBSCO, Emerald, and Science Direct,) to find various HR analytics that contribute to the BI as an overall. According to the survey, Human Resource analytic as a component of BI assists a business in systematically managing Human Resources through the usage of warehousing technologies and data management across various HRM functions. As a result, the organization's workforce is more stable. A steady work force, on the other hand, contributes to continued company development and assists the sustainability of an organization, creating a competition for the firm in its business' external environment. According to the study's findings, HR analytics as a type of BI aids in the simplification of HR tasks and the creation of strategic balance with overall company objectives. The current study is a moderate effort to bring together several previous researches in a relevant way to produce a demand for the usage of business intelligence in HRM field.

**Keywords:** Data management, HR analytics, Data warehousing, and Business intelligence.

### I. INTRODUCTION

In the recent decade, a dramatic development in the field of Human Resources (HR) has drawn the attention of corporate houses. HR has shifted its emphasis from a qualitative to a quantitative and more successful strategy. Business intelligence (BI), on the other hand, aids in the integration of people skills and technology in order to optimize a company's value.

Evidence-Based Management is at the heart of the current HR strategy (EBM). This method aids in making the best business decisions. According to the research, the influence of EBM on management practices and corporate performance is increasing dramatically. Despite the fact that HR studies have drawn the attention of academics, and there is a perceived need to provide adequate attention to this sector in reality, very few firms are capable of quantifying

the genuine worth that employees offer to their companies [10]. As a result, HR must evolve from descriptive measurements and KPIs to the analytics of prescriptive and predictive.

HR Analytics, Human Capital Analytics, and Workforce Intelligence, are some of the names that can be used interchangeably to refer to Workforce Analytics. The global economic crisis is a critical moment that has given rise to workforce analytics research. Modern firms are more eager than ever before in gathering more and more business data and HR. According to the Center for Advanced Human Resource Studies<sup>1</sup> (CAHRS) 2010, current HR Analytics methods are as follows:

- a) Identifying and managing leaders to drive success
- b) Improved risk management
- c) Front-line supervisor characteristics connected to performance
- d) Examining the differences to identify Key Success Factors.

According to the research, firms that employ HR analytics as part of their company policies do much better than those that do not. As proof, MIT, IBM, and other high-performing organizations are almost double more advanced in their use of analytics than lower-performing companies. Oracle (2011) discusses the two essential aspects that aid in determining the influence of labor on organizational success. The first component is the data user's capacity to readily gain access to and employ analytic skills, while the second is concerned with data accessibility at multiple levels of the organizational hierarchy, including not only workforce data but also operational, financial, and customer data. HR Analytics may help an organization's bottom line by reducing labor costs. Business intelligence is a vast subject that brings together technology, people skills, applications, and organizational processes to enhance tactical and strategic business decisions and policies. Analytical tasks for reporting,

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1.Source: [https://est05.esalestrack.com/eSalesTrack/Content/Content.ashx?file=232\\_17acb-5e27-4c3f-b413-798ef6f8e57d.pdf](https://est05.esalestrack.com/eSalesTrack/Content/Content.ashx?file=232_17acb-5e27-4c3f-b413-798ef6f8e57d.pdf)

querying, visualizing, running advanced analytical techniques, and generating online reports for clustering, segmentation, classification, and future business prospects are included, as are data management techniques for planning and collecting, and also storing, and make data as a structured data to turn it into data marts and data warehouses. Data warehouses are concerned with enterprise-wide data, whereas data marts are concerned with a particular department, or process such as Human Resources (HR).

#### A. Background Study

In the recent decade, there has been a substantial shift in HR practices toward HR analytics. This subject has drawn the attention of academics in the academic sphere, and finally the current study has come across many models and frameworks for the study of HR analytics.

The authors of a research discovered a perceived requirement for the use of metrics and analytics in an organization's HR department to play a strategic role. The increasing usage of

information technology is a clear good indicator that introduces change in the field of human resources in terms of its functionality [6]. However, the main worry in the process of effecting such change is the usefulness of cost benefit and impact analysis and Return on Investment (ROI) [7]. However, with the development of a company, the issue of information overload in the HR area has given significance to the application of analytics for effective handling of HR issues [1]. A paradigm known as Human Capital Management (HCM) was created in a research to illustrate how the HR function may move beyond evaluating operating variables and focus on more strategic challenges. The same research also illustrates how a firm's future worth is determined from leading indicators and intangibles, with a rise in the value of intangibles owing to the use of technology and information in place of physical assets.

Although there are many empirical evidences showing the link between a firm's financial success and HR metrics in general, the intellectual community discloses that specialized frameworks have not yet been built to improve such a relationship and to impose better HR strategies [2]. Another research indicates that HR management is not yet totally linked with a firm's strategic business objectives, preventing it from being a strategic business partner. According to the same study, the Human Capital Framework may be utilized as a technique to connect human capital procedures with business strategy in order to leverage financial outcomes and demonstrate value-addition to a corporation [8].

According to the author of a research, the best approach to connect the elements of strategy and analytics is through a human capital (HC) scorecard. The scorecard is generated from a strategy map, similar to the original balanced scorecard, that connects human resource activities, inputs, and human capital outputs and displays how they are related to a firm's bottom line human resources growth [4]. In this regard, one of the most pressing issues is training multinational corporations on how to integrate their HR systems and practices with changing global labor market realities. By incorporating

Data analytics and BI into HRM procedures and database strategies, they may develop, retain, and recruit employees while staying ahead of the global business competition [5].

Another research found that having an end-to-end range of analytics capabilities backed by an integrated analytics strategy allows firms to increase or shrink the distance between themselves and rivals to improve their overall competitive advantage [3]. It was proposed that corporate dynamics may be regulated by making proper use of data and analytical approaches. These are referred to as Performance Analytics. As a result, analytics can give a competitive advantage that is not fully recognized by traditional or sophisticated Performance management systems (PMS) [9].

## **B. Aim and Objectives**

The purpose of this research is to find different Human Resources analytic as component of Business Intelligence tools and software for efficient and structured HR issue management. This study also shows the significance of business intelligence (BI) in the area of HRM by incorporating diverse established BI models such as SAP ERP Workforce Analytics, Retention Modeling, SAS Human Capital Predictive Analytics and IBM Cognos

Business Intelligence, and Oracle Human Resources Analytics. The research focuses on how various BI models aid in achieving long-term business success by strategically aligning HR challenges with overall business goals.

### **C. Methodology**

The research takes an approach that's descriptive. The published publications (mostly from EBSCO, Science Direct, and Emerald) and official websites of a few organizations are being evaluated in order to find various HR analytics in practice that contribute to overall BI.

### **D. Elements of business Intelligence**

Modern commercial organizations have greater access to data than ever before. Companies collect, gather, and store massive amounts of data ranging from consumer feedback surveys to the creation and delivery of goods and services. Business intelligence is a set of approaches that organizes data in a methodical manner in order to make it more relevant. This, in turn, helps to increase an organization's profits. On the other hand, translating raw data into useful information assists a company in making strategic decisions about the same. Despite the fact that research on BI is wide, it may be divided into the following primary components<sup>2</sup>. BI's five basic components are as follows:

a) OLAP (Online Analytical Processing) This BI component allows executives to filter and pick data aggregates for strategical monitoring. Corporates can make changes to their entire company operations with the use of certain OLAP software tools.

b) Advanced Analytics or Corporate Performance Management (CPM) This BI component assists company executives in viewing facts relating to supply, demand, and satisfaction for a certain service or product. Using such useful information, organizations may extend or decrease their operations across different geographical locations. This might potentially be a source for finding potential markets.

c) Real-time BI This component has grown increasingly demanding and popular in today's mobile world, when individuals expect every comfort and information at the tip of their fingers.

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corporation may use this technology to respond to the trend of real-time in , email, messaging systems or

even digital displays by employing software programs. Because of its real-time orientation, traders can publicize unique deals on a personalized basis based on the individual demands and preferences of its end-users. One of these common services in business is the use of coupons.

d) Data Warehousing It's the process of storing vast volumes of data in meaningful and relevant ways so that other subsystems within a company may benefit from it. It aids in the development of interdependence among an organization's many subsystems. It aids future business statistics analysis by understanding how distinct subgroups in business units are connected to one another and how one may impact the other in a particular scenario. For

example, business executives might compare shipment times at several facilities to see whether processes or teams are more efficient than others.

e) Data Sources: Data sources are the components of BI that require the storage of large amounts of data and the usage of various software tools to turn it into usable information. Using software applications, an organization's divisions or subsystems can use these data sources for their own advantage in a manner that is suitable with their needs. This method may be used by BI analysts to construct data tools that allow data to be loaded into a vast cache of tables, spreadsheets, graphs or pie charts, among other things, and then utilized for a number of business applications. It actually aids a company in making fact-based business decisions.

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2. Source: [https://www.villanovau.com/resources/bi/overview-ofbusiness-intelligence-bi-components/#.WA7aDf194\\_4](https://www.villanovau.com/resources/bi/overview-ofbusiness-intelligence-bi-components/#.WA7aDf194_4)

## **II. MAJOR AREAS OF APPLICATION FOR BI IN HR**

Organizations develop financial and operational strategies to achieve their strategical objectives, and then launch projects to put those plans into action.

A. Performance Measurement and Monitoring: In order to measure performance, Key performance indicators are defined, and assessments are conducted in compliance with these same key performance indicators. KPIs must be developed for each level of the organization and for each functional area, from the highest to the lowest, based on their distinct performance characteristics. Furthermore, these KPIs serve as indications for assessing the project's incremental development.

Work satisfaction, employee retention, benefits and salary, accident levels, employee training, employee performance and employee absenteeism, are examples of human resource performance indicators.

B. KPIs are compared to strategic objectives and goals when analyzing performance using the Management by Objective (MBO) strategy. The findings obtained are then used to monitor performance and identify actions to enhance it. In respect to the performance indicators, the Advanced Analytics module allows businesses to take decisions in accordance with business goals and objectives, as well as their plans and resources.

C. Decision Making and Performance Feedback Through the use of BI, organizations can modify their objectives and goals, re-allocate resources and programs in the most effective way possible. In essence, performance metrics serve as a loop of feedback in the process of company performance management.

## **III. DATA ANALYTICS AND BUSINESS INTELLIGENCE FEATURES IN HUMAN RESOURCES**

HR analytics, as a subset of BI technologies, assists firms in streamlining the process of managing human resources. It has been found that the higher the size of an organization and

the maturity of the business, the more the demand for HR analytics to handle different difficulties in the HR area. The use of HR analytics also aids in projecting future trends in HR, which includes planning and succession, so aids in aligning HR activities with a corporation's strategic business functions.

Several technology behemoths have developed numerous valuable HR analytics to improve the productivity of HR services inside a firm. Some of these HR analytics are as follows:

### **A. SAP ERP Workforce Analytics<sup>3</sup>**

This product contains features and capabilities that aid in certain commercial operations.

a) **Workforce Planning:** This analytics tool analyzes demographics of the work force to assess current human resource trends and prepare for the required condition of HR in the future. It takes into account the information on the rates of turnover and workforce composition. The analytics data may be immediately connected to budgeting, and headcount planning, important talent operations like recruiting and learning.

b) **Cost-cutting and workforce simulation.** Such analytics solution assists the professionals of the Human Resource department with all cost-planning of workforce duties and empowers HR leaders to create successful plans. Allow access to a wide range of data which is related to workforce to promote correct planning, and to make it possible to keep track of real performance on a constant basis and enable simulated planning scenarios, in reference to the plan.

c) **Workforce Comparison** This human resource analytics tool compares worker activities to external benchmarks and internal operating systems by measuring them against certain established criteria.

d) **Analytics and measurement of workforce processes** This analytics tool is used to track and analyze fundamental HR activities including payroll, time management, personnel administration, and other perks. It also examines organizational structures, connections, and job and position characteristics.

e) **Analytics and measurement for talent management** Analyzes staff abilities and credentials, as well as the effectiveness of recruiting procedures. Measures the efficacy of different learning and training programs, evaluates how successfully succession plans prepare workers to take and acquire critical roles, and maintains operational continuity. Through specific career planning programs, it evaluates the success of connecting employee aspirations with business goals. It also examines the cost-effectiveness of employee benefit packages.

f) **Strategic Alignment:** This analytics tool guarantees that all business actions are in alignment with the organization's strategic objectives. It also enables Employees' teams to collaborate on shared goals despite of location by utilizing digital technology. It employs a balanced scorecard framework with preset workforce scorecards to combine individual goals and department with the assistance of management-by-objective (MBO) papers in order to connect employee goals with company strategy.

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Source: <http://www.sap.com/solutions/businesssuite/erp/featuresfunctions/workforceanalysis/index.epx>

### **B. Retention Modeling and SAS Human Capital Predictive Analytics<sup>4</sup>**

SAS Institute has launched this exclusively Business Intelligence which is focused on Human Resource, which aids in the making of different HR-related choices. The following are the general characteristics of this Human Capital Predictive Analytics:

- a) It estimates turnover % by categorizing employees who are at risk of quitting their positions voluntarily into high, medium, and low risk groups.
- b) Determines the reasons for terminations or voluntary turnover.
- c) Determines the best performers.
- c) Investigates the reasons why high-performing employees quit their positions willingly.
- e) Classifies employees as low, medium, or high risk for termination.

### **C. Oracle Human Resources Analytics<sup>5</sup>**

Oracle's HR analytics is comprised of the following features:

- a) Worker Insight: tracks workforce demographics in order to improve recruitment and retention. It also includes strategies for reducing staff turnover.
- b) Targeted Workforce Development: This is a talent management strategy. Considers both top and bottom performers and employs suitable talent management techniques.
- c) Improved Remuneration: fosters an awareness of how compensation affects performance, ensures equal and consistent compensation across jobs, and aligns variable compensation with the organization's objectives and goals.
- d) Absence and Leave: Tracks employee absence and forecasts future trends to anticipate the engagement of employees.
- e) Improved HR Performance Understanding: compares overall employee's productivity and performance to industry best practices such as revenue per employee, contribution per headcount, and human capital's return.
- f) Statutory Compliance: Ensures that HR policies are in accordance with different legal requirements.
- g) Worker Planning: Keep track of workforce demographics in relation to recruiting and retention goals. Planning and Simulation of Workforce Costs

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4 Source: <http://www.sas.com/solutions/hci/hcretention>

5 Source: <http://www.oracle.com/us/solutions/ent-performancebi/hr-analytics-066536.html>

#### **D. Human Resource Performance Management and IBM Cognos Business Intelligence <sup>6</sup>**

This package contains the following features related to the five Human Resource main areas:

a) Organization and Staffing: identifies work responsibilities, positions, roles, and competences in relation to business performance needs.

b) Compensation: establishes the process of compensating employees in order to keep and inspire them to perform better in the future.

c) Talent and Succession: establishes suitable talent management procedures as well as identifies and develops prospects for future key role replacement.

d) Training and Development: establishes effective strategies for meeting specific performance goals.

Data management becomes a challenging chore as business houses expand and mature, yet It is essential for long-term growth and progress. This difficulty of business houses was overcome by business intelligence. Because Organizational decision making has gotten increasingly complicated as the corporate environment has changed. However, Business Intelligence is assisting firms in making more timely and trustworthy information-based business choices.

Business intelligence is said to be made up of four primary interconnected subsystems: data management, business performance, information delivery, and advanced analytics. The Data Management subsystem is responsible for converting storage of data into data warehouses(DWH), databases, and data marts. Multidimensional data analysis is feasible using Online Analytical Processing (OLAP). The Advanced Analytics processing system, on the other hand, comprises statistical, forecasting, predictive modeling, data mining, predictive analytics, and data optimization methodologies. The Company Performance system is made up of systems for decisions making and measuring performance to enhance business performance. Key Performance Indicators (KPIs) appear to play an important role in this subsystem. KPIs are used to track the progress of an organization's goals. The subsystem of Information Delivery provides users with real time information and in the manner they want. The end users may monitor essential actions in simple formats such as customizable portals which provide information, scorecards, and dashboards. As a result, BI streamlines all company tasks into a logical and streamlined procedure.

HR analytics as a component of BI assists a business in systematically managing Human Resources through the use of warehousing technologies and data management across various departments of Human Resource Management. As a result, the organization's workforce is more stable.

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6 Source: <http://www-01.ibm.com/software/data/cognos/solutions/human-resources/index.html>

A steady work force, on the other hand, contributes to continued company growth and assists an organization in its sustainability, creating a competition for the firm in its business environment which is external.

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