

## **PREDICTIVE ANALYSIS ON HUMAN RESOURCE FUNCTIONS: IS THERE AN INFLUENCE OR NOT?**

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### **ABSTRACT**

With recent advances in data-driven analytics, and the resultant improved capabilities in working with huge datasets, strategic planning has become more complex for business units, and subsequently for the human resource (HR) function. Most business units have already adopted predictive analytics to guide their decision-making and strategy development processes. The new opportunities offered by predictive analytics are applicable to all core HR processes such as talent acquisition, attrition risk management, employee sentiment analysis, and capacity planning. The employees at different levels may have different opinions on using predictive analysis in HR functions and its ultimate effectiveness. On this ground the research is primarily focused on identifying the influence of various Predictive analysis (using) factors on HR functions. The study was among 120 employees where it is identified that the opinion differences are evident based on designations of the employees. This indirectly shed some light on the fact that there is knowledge of identifying the relevance of PA and evaluating its effectiveness varies according to the designations. Everyone may not be exposed to the process in an equal manner and thus there may be an element of information asymmetry. Other demographic factors have no much influence on the opinions related to PA using factors in the organizations. It could also be found from this study that there is an influence of PA(using ) factors on HR functions whereas within the factors predictive analysis use in training and development is relatively significant than other factors under study. There are also factors that fall outside the scope of the study which could influence the outcome in a significant manner.

***Keywords:*** Predictive Analytics, HR Analytics, HR Functions, Effectiveness, Perception

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## INTRODUCTION

With recent advances in data-driven analytics, and the resultant improved capabilities in working with huge datasets, strategic planning has become more complex for business units, and subsequently for the human resource (HR) function. Most business units have already adopted predictive analytics to guide their decision-making and strategy development processes. The new opportunities offered by predictive analytics are applicable to all core HR processes such as talent acquisition, attrition risk management, employee sentiment analysis, and capacity planning.

The new generation of HR executives is moving from making reactive decisions solely based on reports and dashboards towards correlating business data and human resource data to predict future outcomes. Predictive analytics for HR is based on establishing a data-driven statistical relationship between the goals and initiatives of the HR function and the success or failure of an organization in achieving strategic goals. This relationship can help HR executives assess the results of their decisions and devise a long-term strategy. While this requires a significant shift in the function and use of data, the good news is that most organizations already have the required data for this purpose.

It is a known fact that employee attrition is an unpredictable and uncontrollable factor that adds significantly to the ineffectiveness of processes. This problem can be attributed to dissatisfaction to various aspects of a job, for example career aspirations, work location, salary, performance management, job satisfaction, managers and many more. Employee attrition control is critical to the long term health and success of any organization. To reduce the cost of attrition, organizations need to ensure that employees' aspirations are met. It is a known fact that retaining the best employees ensures customer satisfaction, increased revenues and satisfied colleagues and staff. Organizations invest a lot of money on training, giving employees onsite opportunity, offering compensations above market level to retain employees. However, currently these methods are being generically applied in order to control employee attrition and improve effectiveness of HR processes. This paper is an attempt to show the effectiveness of Predictive Analytics in HR Functions.

## Literature Review

Human Resources have always been the important asset of the company. To have a competitive edge, employees should be treated as resources and thus by aligning human resource function to the core business goals, organizations can achieve success in the competitive market. Human resources are always at the very core of the organization's success. HR analytics plays a very important role in aligning the HR strategy with the overall business strategy. HR analytics aids the HR managers to formulate the strategies which enable the organization to gain an upper hand over its competitors. (Weena Yancey M Momin, Taruna, 2015)

The need of proving of HR's importance as a function in figures has been a challenge for many professionals even since the 1980's. Since then, metrics have experienced a slow but constant evolution from a simple transactional monitoring point of view, to predictive analytics. Nowadays, some practitioners are preoccupied with more than just assessing the results and impact of HR, they are in the point of predicting the future outcomes. The new HR analytics is defined as a framework of logic, meant to gather, organize and interpret data so that it can predict the probability of upcoming events.

It consists of 4 phases

- Scanning – The assessment of all the internal factors that might have an influence on human, structural and relational capital;
- Planning – The creation of a system that provides an alternative to the structured system by relying on sustainable human capability rather than on just filling positions is done in planning phase.
- Producing – HR are viewed as processes with inputs and outputs and statistical analysis is used in order to reveal the most suitable combination of inputs that drive the desired outputs;
- Predicting – the system consists in analysing strategic, operational and leading indicators.

Practitioners propose five steps of analytics

- Recording the work: hiring, paying, training, supporting, retaining;
- Relating to the organization's goals: quality, innovation, productivity, service;
- Benchmarking: comparing our results to others;
- Descriptive analytics: understanding past behaviour and outcomes;

- Prescriptive analytics: predicting future outcomes.(Emanoil MUSCALU1 Anca SERBAN2,2014)

### **Predictive Analytics**

The term predictive analytics simply refers to a particular use of data mining technologies where data are scored. A new loan applicant may be scored based on the patterns that have emerged while processing historical data. The score may simply put the new prospects into the category of ‘unsuitable’ or ‘suitable’ – or the categories may be more finely grained. (Martin Butler,2013).

Every aspect of a business has analytics attached: Finance, logistics, sales, customer profiles, and marketing all have their own set of analytics tools. Though Human Resources (HR) also use some workforce analytics, until recently, analytics were not as data based. Workforce analytics are traditionally more intuitive, driven by ensuring knowledge transfer, the right skill sets are found, and on-boarding objectives are met. However, increasingly, companies want data to back up decisions made by their HR team.

Predictive Analytics, based on worker-based statistics, is becoming more and more appealing, allowing HR departments to be more strategic in predicting whether they will have enough resources next week, but also, have the right skills on their team three years down the road. The Globe and Mail reported in a recent article, “How to find and keep the right people,” Stantec is one example of a company investing in predictive data analysis to “use statistical models to identify trends and develop short- and long-term strategies for hiring, retaining and developing talent.”

### **Predictive Analytics in HR**

In 2009, *The Wall StreetJournal* reported on Google’s algorithm that crunched data from employee reviews and promotionand pay histories to determine which employees are most likely to quit, and more recently Googlewas lauded for pioneering the use of big data to predict employee turnover. Laszlo Bock said thishelped Google “get inside people’s heads even before they know they might leave.” This month,Credit Suisse said it calculates who is likely to quit, and proactively offers them new career roles. WillWolf, the Global Head of Talent Acquisition & Development said that even if employees are notinterested in the offered roles, “they are

blown away that we're going out of our way to try to find them something interesting and new." (John Boudreau, 2014).

HR analytics works by gathering workforce data, from work history to employeesatisfaction scores, and feeding this information into advanced computer models. Using sophisticated algorithms, these models churn out insights that HR leaders can use to make critical decisions, such as whether to tweak commission structures to drive sales or invest more heavily in training to curb high attrition rates. By identifying top employees that are about to leave the company in the nick of time, or sweetening the compensation pot for Baby Boomers considering early retirement, an HR analytics application, effectively deployed, can save a company millions of dollars in lost talent. Factors such as location, pay scale and personality type can all be fed into an HR analytics system to preserve the best people in a talent pool. (Cindy Wexer, 2013).

The majority of the organizations is thus not able to measure the contribution of their intangible assets objectively, or based on the right measures. Instead, methods used are fairly standard analytical tools, such as regression, and most organizations only focus on data that is easy to understand and/or consume (Fink, 2010). In general, the main focus of HR is on collecting and reporting data about activities instead of outcomes, while the analyses are mostly very simplistic (e.g., limited analyses of drivers of outcomes). As a result, there is a need for HR to develop itself from descriptive metrics to predictive analytics (Ulrich, 2010).

Human resource predictive analytics is an evolving application field of analytics for HRM purposes. The purpose of HRM is measuring employee performance and engagement, studying workforce collaboration patterns, analyzing employee churn and turnover and modeling employee lifetime value. The motive of applying HRPA is to optimize performances and produce better return on investment for organizations through decision making based on data collection, HR metrics and predictive models. (Sujeet N. Mishra, DevRaghvendra Lama, Yogesh Pal, 2016).

HR analytics is one of the latest emerging fads is a paradox in itself. The promise of analytics is great: replacing fads with evidence-based initiatives, providing data-based decision making, bridging management academia and practice, prioritizing the impact of HR investments, bringing

rigor to HR, and supplementing HR intuition with objectivity. Large parts of HR analytics are, however, not new. People have talked about HR metrics, utility analysis, HR scorecards, HR ROI, personnel economics, and evidence-based management for

years without a large, noticeable step change in the business impact of HR. So far, the published evidence supporting the alleged value of HR analytics is actually quite slim — it is currently based more on belief than evidence and is most often published by consultants with a commercial interest in the HR analytics. (Thomas Rasmussen & Dave Ulrich, 2008).

The future of HR analytics depends on its integration with the organization. There should be an updated and well developed IT infrastructure. HR analytics will move from simple statistical reporting to evidence based predictive decision making. (2017)

## **STATEMENT OF THE PROBLEM**

Advent of analytics and use of it in human resources management has significantly improved in the last few years. This has widened the fortune of many organizations as the prediction of future timeframe and the variables in it has become more hands on than before which reflects the predictive analytics side of the human resource analytics spectrum. In this context it becomes necessary for identifying the effectiveness of HR functions in organizations applying analytics, specifically from the employee point of view. The different levels of employees may have different opinion on the effectiveness and this may be influenced by several demographic factors among the employees of different departments even. More over Predictive Analysis (using) factors may have different levels of influence on HR function effectiveness. Thus the problem is defined for the purpose of this study.

## **OBJECTIVES OF THE STUDY**

- To study the influence of various Predictive analysis (using) factors on HR functions
- To check whether there is any difference in opinion on effectiveness of HR functions among groups based on demographic factors

## HYPOTHESIS TO BE TESTED

The following hypotheses were used for the study;

### **Hypothesis 1:**

**H<sub>01</sub>:** There is no difference in opinion among groups based on demographic factors with respect to effectiveness of HR Functions.

**H<sub>11</sub>:** There is difference in opinion among groups based on demographic factors with respect to effectiveness of HR Functions.

### **Hypothesis 2:**

**H<sub>02</sub>:** There is no significant relationship between usage of Predictive Analytics and HR Functions.

**H<sub>12</sub>:** There is significant relationship between usage of Predictive Analytics and HR Functions.

## ANALYSIS AND DISCUSSIONS

DEMOGRAPHIC VARIABLES	FREQUENCY	PERCENT (%)
<b><i>Gender</i></b>		
Male	84	68.9
Female	36	29.5
<b><i>Age</i></b>		
20-29	50	41.0
30-39	50	41.0
40-49	12	9.8
50 above	8	6.6
<b><i>Designation</i></b>		
Executive	32	26.2
Senior Executive	32	26.2
Assistant Manager	34	27.9
Manager	22	18
<b><i>Department</i></b>		
Talent Acquisition	28	23.0

Compensation & Benefits	24	19.7
L&D	22	18.0
HR Operations	20	16.4
HR BP	26	21.3
<b>Experience</b>		
1-5	30	24.6
6-10	42	34.4
11-15	22	18.0
15 above	26	21.3

### **Observing whether there is a difference in opinion among groups based on demographic factors with respect to effectiveness of HR Functions**

To realize this objective the following hypothesis is framed.

#### **HYPOTHESIS 1**

**H<sub>01</sub>:** There is no difference in opinion among groups based on demographic factors with respect to effectiveness of HR Functions.

**H<sub>11</sub>:** There is difference in opinion among groups based on demographic factors with respect to effectiveness of HR Functions.

In order to test this hypothesis as per the objective, five sub-hypothesis are established for the demographic characteristics of the study, viz., gender, age group, experience, department and designation. Accordingly, the following hypotheses are tested.

The sub hypotheses used are:

Sl.No	Sub Hypothesis To Be Tested	Result
1	<b>H<sub>011</sub>:</b> There is no difference in opinion among groups based on gender with respect to effectiveness of HR Functions.	Accepted
	<b>H<sub>111</sub>:</b> There is difference in opinion among groups based on gender with respect to effectiveness of HR Functions	Rejected
2	<b>H<sub>012</sub>:</b> There is no difference in opinion among groups based on Age groups with respect to effectiveness of HR Functions.	Accepted

	<b>H<sub>112</sub>:</b> There is difference in opinion among groups based on Age groups with respect to effectiveness of HR Functions	Rejected
3	<b>H<sub>013</sub>:</b> There is no difference in opinion among groups based on Designation with respect to effectiveness of HR Functions.	Rejected
	<b>H<sub>113</sub>:</b> There is difference in opinion among groups based on Designation with respect to effectiveness of HR Functions.	Accepted
4	<b>H<sub>014</sub>:</b> There is no difference in opinion among groups based on Department with respect to effectiveness of HR Functions.	Accepted
	<b>H<sub>114</sub>:</b> There is difference in opinion among groups based on Department with respect to effectiveness of HR Functions	Rejected
5	<b>H<sub>015</sub>:</b> There is no difference in opinion among groups based on Experience with respect to effectiveness of HR Functions.	Accepted
	<b>H<sub>115</sub>:</b> There is difference in opinion among groups based on Experience with respect to effectiveness of HR Functions.	Rejected

### Examining the influence of Predictive Analytics (using factors) on HR Functions

To realize this objective the following hypothesis is framed.

#### HYPOTHESIS 2

**H<sub>01</sub>:** There is no significant influence of various PA(using) factors on HR Functions

**H<sub>11</sub>:** There is significant influence of various PA(using) factors on HR Functions

To test the above mentioned hypothesis, the statistical technique multiple regression is used.

The below table displays the R Square and adjusted R Square value.

#### Table showing the influence PA (using) factors on HR Functions

##### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.671 <sup>a</sup>	.450	.421	2.01135	1.815

a. Predictors: (Constant), Talent Development, Recruitment, Compensation

b. Dependent Variable: HR functions

**INTERPRETATION:** From the above table it is observed that the  $R^2$  value is 0.450 which means the strength of association between the dependent and independent variables is 45%. It also means that other factors account for 55% which are not considered in this study.

**Table showing the influence of various PA (using) factors on HR Functions**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	16.937	2.222	7.622	.000
	Recruitment	.474	.179	.298	2.646
	Compensation	.379	.178	.249	2.125
	Talent Development	.676	.268	.300	2.526

**INTERPRETATION:** It is also evident from the table that the t statistic value for the factor recruitment is 2.646 which is significant at 5% level (i.e.,  $p = 0.011$ ). For the factor compensation the t statistic value is 2.125 which is significant at 5 % level (i.e.  $p = 0.038$ ). For the factor talent development the t statistic value is 2.526 which is significant at 5% level (i.e.  $p= 0.014$ ). Hence, the null hypothesis  $H_0$  is rejected and  $H_1$  is accepted. Therefore, there is an impact of predictive analytics (using ) factors on HR Functions.

On scrutiny of the Beta scores, it is further evident that the variable talent development ranks first ( $\beta = 0.300$ ) which reveals that of all the factors that are significant, talent development alone accounts for 67.6%. The variable recruitment ranks second ( $\beta = 0.298$ ). The variable compensation ranks third ( $\beta = 0.249$ ).

## Discussion

The study draws a temporal conclusion within the scope determining that there is a significant influence of predictive analysis (using) factors on the HR functions. The Predictive Analysis (using ) factors for the study means the various HR functions adopted for the purpose of the study which applies predictive analysis. Thereby from analyzing the factors it is also identified

that the highest influence is reflected on Talent development followed by recruitment and compensation. From the study it could be also inferred that predictive analysis is perceived to be of greater usage in talent development activities/ functions of the overall HR function in the organization in comparison to compensation and training. Reading together it could be again inferred that recruitment and talent development attracts the application of predictive analytics and compensation management is yet to attract the scope of predictive analysis

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