

Impact of Big Data Analytical Tools on Talent Management in the Service-Based Industry: A Sustainable Move

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[Abstract] Big data analytical tools have been used widely in the service industry. This paper will study the impact of sustainable big data analytics tools in talent management and how these tools are helpful in the day-to-day activities of the talent management function of the organization. How companies retain good talent in the organization is the key to success. It happens with the right mix of many factors, like compensation benefits, bonuses, equal opportunity for growth, and involvement in decision-making, to name a few. Therefore, this study explores and analyzes the available literature on retaining talent in the organization and how big data analytical tools are helpful in this decision-making in the talent management domain. The instrument designed to measure this has 21 items on a 7-point Likert scale. The respondents are HR professionals working in the service-based industry. The responses were collected from 60 HR professionals in Pune city with the help of an online survey instrument (google forms). The study also considers the demographic traits and other BDA tools organizations use to maintain employee data. These BDA tools analyze the current data and can make predictions, which can help in decision-making. These technology and tools fall under the United Nations Sustainable Development Goal Number 9 -- Industry, Innovation and Infrastructure.

[Keywords] big data analytical tools, talent management, HR analytics, HR professionals, service-based industry

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Introduction

Big Data refers to the software tools that can quickly analyze enormous volumes of data from various platforms. People-related data is utilized in human resource management to understand better the organization's human capital, workforce capacity, risk, and business performance. Business analytics applies the analytical process used to gather, store, and analyze data. Business analytics (BA) refers to the skills, tools, and methods used for continuous, iterative study and research of areas other than the performance of for-profit businesses to obtain knowledge and direct business strategy. Business success in an organization now heavily depends on the talent and creativity of HR.

The typical human resources and talent management department generate a sizable amount of daily data. Consequently, there is fierce competition among rival companies for HR skills. As a result of the employees' diverse requirements and objectives, HR managers need help to train and motivate them. Because of its clear link with corporate business and strategy, HR data must be big data. Big data for human resources enables more informed HR decision-making by improving corporate situational awareness and ensuring improved recruitment, retention, and training outcomes.

Information about hiring, career advancement, training, individual performance, organizational competency, and more. Data on employee absence.

HR departments are a veritable treasure of “people data” for businesses. In the future, data-driven operations and informed judgements will be the norm for intelligent companies and talent management specialists. Because of the size of big data, it is hard to employ traditional data analysis methods. Instead, data scientists use the right tools to extract valuable insights from the data. The growing emphasis on data-based performance excellence has made data science and data-driven decision-making crucial. Therefore, it is essential that a company deal with its strategic problems and build its customer market strategy on data. Data science approaches may be used to investigate patterns in data to validate suspicions held by the organization and to provide it with new information that could inspire it to respond to chances for competition differently. The stakeholders are then informed of the recent news, and data visualization tools are used to ensure that they know the results’ nature and that the proper next steps are laid out. The digital devices that are a part of the Internet of Things - such as mobile phones, desktop and laptop computers, and wearable gadgets - generate, collect, and store a wide variety of data.

Literature Review

Business analytics, according to Wang, Gunasekaran, Ngai & Papadopoulos (2016) is the analysis of the abilities, technologies, applications, and processes used by various businesses to gain a better understanding of the data and statistics related to trade so that the organizations can run their operations accordingly. Using BA will provide HR managers with the ability to predict employee performance based on past data. Additionally, it will make it easier for HR managers to collect, review, evaluate, study, and comprehend data more thoroughly. After all, data is being utilized more to transform decision-making in other functional domains (Malthouse, Haenlein, Skiera, Wege, & Zhang, 2013; Payne & Frow, 2005).

Big data analytics offer a variety of sectors with evidence-based decision support solutions. To extract useful information and knowledge from data generated from a variety of sources to support decision-making; data-based decision-making necessitates the use of the proper principles, processes, and techniques during data collection, analysis, examination, and interpretation (Azhar, 2020; Yin, & Kaynak, 2015). The 5Vs, like volume, velocity, variety, variety, and value serve as a framework for extensive data analysis. Volume infers the quantity of data created from various sources, like digital devices, the internet, social media, mobile phones, etc. Velocity is the rate of real-time data flow and processing. Variety refers to many data sources and forms -- text, images, video, and sounds, including those recorded by wearable technology, all make up the data. Data’s veracity is determined by its accuracy and conformance to the facts (Mandinach, 2012). The advantages and satisfaction gained through processing determine the value of data. Big data variability reflects the cyclical peaks connected to extremely erratic data flows (Lakshen, Vraneš, & Janev 2016). To find relationships and patterns in the data, data, visualization tools, like Tableau and Microsoft Power BI, are significantly used (Ishaq Azhar Mohammed, 2020).

To ensure that decisions are informed by information and knowledge, the leadership must foster a data-driven decision-making culture in the organization. The effectiveness of decision-making will depend on the amount and diversity of sources, the transfer, processing, and visualization technologies, the integrity of the data, and the organization’s extensive analytical skills. Realizing the promise of big data analytics for decision-making and performance enhancement will require the capacity to build considerable solid data analytics skills (Herschel & Miori, 2017). Big data analytics includes data analysis into three categories: descriptive, predictive, and prescriptive (Bikakis, N., 2018). Summary statistics are used in descriptive analytics to offer information on current performance and how decision-making may be strengthened in

light of learned lessons. By analyzing previous performance to forecast future performance, predictive analytics are used, which use data mining and machine learning to give insights and information about forecasting. To give wisdom and knowledge on the evaluation of possibilities that can occur in the future and describe its course of action will enhance decision-making and performance; it is described as prescriptive analytics, which use simulation models and optimization approaches to increase performance (Chung, Ma, Hansen, & Choi, 2020). Organizations can attain sustained success by using different approaches to business analytics. All this defines the capability of the BDA tools. The link between managerial and technical big data analytic capabilities and operational, financial, and marketing success was explored in research of 209 organization leaders that utilize big data analytics for decision-making in India (Wamba, Gunasekaran, Akter, Ren, Dubey, & Childe, 2017). The study discovered that having access to big data analytics improves organizational effectiveness.

The Rationale of the Study

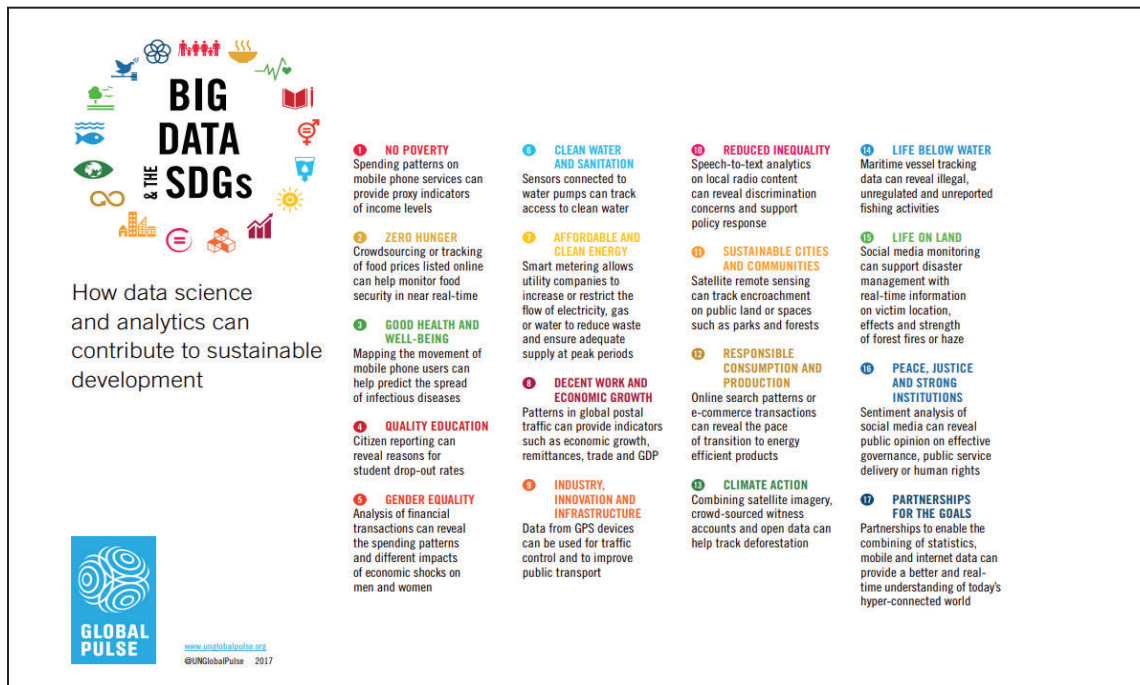
Nearly 70% of respondents to a poll by the International Public Management Association for Human Resources (IPMA-HR) claimed they track HR indicators. However, more than merely collecting all of this data is required; to achieve company objectives: it must be used. Big data analytical tools enable use of employee data in the organization-wide integrated data repository to drive more rigorous decision-making throughout the organization, so the organization can no longer wing it and act on impulse or gut feeling. The following are the main variables used: BDA tools, performance management, talent retention, and decision-making big data has far-reaching effects on a societal, business, and human levels, as claimed by Hacker and Petkova (2017). Big data generally alters how people operate, especially inside an economic institution. Managers of the human resource division may refocus their approach to enhance the working environment for their workers by using big data. The emphasis on big data and people integration shifts attention from operational responsibilities to the organization's more strategic management and its link with big data. Big data applications enable the automation of processes, freeing up the HR department to focus on more strategic responsibilities, like predicting employee attrition and keeping top talent.

H₀1: Big Data Analytical Tools do not help to make effective and improved decisions in the Talent Management area of the service-based industry.

H₁1: Big Data Analytical Tools helps to make an effective and improved decision in the Talent Management area of the service-based industry.

Figure 1.

Big Data & the SDGs (Source - UNGlobalPulse)



Research Methodology

The study conducted is quantitative and explorative. A total of 60 questionnaires were distributed; after scrutiny of missed and incomplete forms, 50 questionnaires were used, an 83 percent response rate. HR Professionals from different IT/ IT enabled service companies from Pune city are being considered for the study to reach the stated objectives. The researcher has used a structured questionnaire which contains 22 questions on a seven-point Likert scale. The preliminary part of the questionnaire measures the demographic characteristics of the HR professionals, such as gender, age, education qualification, work experience, income, firm size, and designation. The second part of the questionnaire measures the extent to which big data analytical tools are used for decision-making about talent management, like Advanced MS-Excel, Oracle HR Analytics, SPSS, Power BI, and Tableau. The last part of the instrument consists of questions to measure the various talent management functions. The scale consists of a 22-item measure of seven dimensions of talent management: recruitment improved training, enhanced employee motivation and engagement, increased retention, forecasting the future (in terms of demand and supply of talent), allocation of the right teams on the suitable projects at the right time, predicting employee performance even before an employee is hired, evaluating layoffs and promotions, minimizing the cost incurred by a bad hire, and helping plan targeted extra benefits to attract and retain talent. The seven-point Likert scale was established to measure talent management parameters. The internal reliability coefficient (Cronbach Alpha) was 0.894 and 0.875 for the “Big Data Analytical Tools” factor and “Talent Management Measures” factor, respectively.

Findings

After assessing the reliability analysis of both factors, descriptive statistics of demographic variables (Table 2) were conducted using the SPSS version 23. Table 3 presents intercorrelation ($r = 0.782$, $p = .000$) between the “Big Data Analytical Tools” factor and the “Talent Management Measures” factor. This reveals an important and positive association between big data analytical tools and Talent Management. Hence, our null hypothesis is rejected.

Table 1

Descriptive Statistics for Demographic Variables

Demographic Variables	N	Mean	Median	Mode	Standard Deviation
Gender	50	1.32	1.00	1	.467
Age	50	2.57	3.00	3	1.032
Highest qualifications	50	2.52	3.00	3	1.065
Work experience	50	2.86	3.00	3	1.171
Income	50	3.16	4.00	4	1.136
Type of sector	50	1.70	2.00	1	.731
Firm size	50	2.19	2.00	1	1.291
Designation of the respondent	50	2.24	2.00	2	1.063

Table 2

Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. The error of the Estimate
1	.985a	.971	.970	.384

a. Predictors: (Constant), Question 9, Question 8, Question 7, Question 4, Question 1, Question 6

Table 3

ANOVA

ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1177.688	6	196.281	1333.958	.000b
	Residual	35.756	243	.147		
	Total	1213.444	249			

a. Dependent Variable: Question 1
b. Predictors: (Constant), Question 9, Question 8, Question 7, Question 1, Question 6

Table 4

Study of Factors

	Mean	SD	Reliability (alpha)	No. of Items	Pearson Correlation
BDA Tools	3.56	0.708	0.894	22	$r = .078^*$ P value = 0.00
Talent Management Function	3.21	0.824	0.875	21	

*. Correlation is significant at the 0.01 level (2-tailed).

Table 2 of the model shows that the R-value of 0.985 is near the range of +1, indicating a positive connection between the factors. In addition, it can be found from Table 1 that the value of R square, 0.971, presents the independent variable explaining the variation in the dependent variable by 97.1%. Further, Table 2 indicates the sig. is 0.00, below the optimum p-value that should be 0.05 ($0.05 > 0.00$). In this case, it can be interpreted that the null hypothesis is rejected. Based on the discussion of both tables, it can be stated that Big Data Analytical Tools help to make effective and improved decisions in the Talent Management area.

Conclusion

According to a recent analysis by the World Economic Forum (2012), big data is a new type of economic asset. This viewpoint is crucial because it clarifies the potential for leaders who can figure out how to utilize that resource. As with any managerial tool, our analytical strategy can be used effectively or ineffectively. The key to completing it well is carefully linking the assessment's main objective with the job's requirements. The endeavor will be rapidly thwarted if attention is paid to employee traits that are genuinely unrelated to performance. So, understanding the factors that influence performance honestly and thoroughly is necessary. Decisions concerning talent management are not only tricky but might also be expensive if not handled correctly. When organizations invest in bad hires or harmful programs, the teams developed are bound to fail, and their talent management efforts are gone in vain. Organizational performance also indeed deteriorates under such circumstances. However, leaders may make better personnel management decisions by implementing and utilizing a data-driven talent evaluation system (TAS). Admittedly, data is increasingly being utilized to transform decision-making across the board. From the prospect of using big data for talent management, the most crucial aspect of implementing it is the deliberate linking of the work needs with the assessment's objectives. The impediments to proper talent management could only be identified and addressed with the knowledge that data provided; in each case, this resulted in excellent organizational outcomes (Grissom et al., 2017).

Research Scope and Limitation

Since the scope of the study is limited to the service-based industry, the study's findings apply only to these industries and cannot be generalized to other sectors. It's a descriptive study with a closed-ended questionnaire; hence, the potential to capture unique insight is limited. The research only focused on IT and the IT-enabled service companies, but future research should consider the effectiveness of BDA tools in other industries. The researcher only studied the correlation between the talent management factors and the effectiveness of BDA tools in decision-making and only considered the talent management areas. This research can be further enhanced and should study the impact of BDA tools in the other areas of HR and operations management.

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