
The Impact of Big Data Analysis on Talent Analysis

*Amal Mohamed Abdelal

Abstract

The purpose of research is to discuss the opportunities for talent analysis in the organization, since the availability of methodologies for analyzing large amounts of data has improved dramatically over the past ten years, organizations have begun to use talent analytics to manage their workforce, so will discuss the following items:

-Big data analysis systems applied and access to talent analytics.

-Discuss a number of case studies on “How talent analytics can improve organizational decision-making.”

-Highlighting opportunities for talent analytics by using big data analytics systems.

Key words : Big data, Talent analytics, Descriptive Analytics, Predictive Analytics, Prescriptive Analytics.

* Teaching Assistant at EL MOTATAWERA institution

Introduction

Over the past decade, the exploitation of big data (i.e., large amounts of structured and unstructured data generated from the routine activities of organizations) has become very popular among organizations (Mayer & Cukier :2013), So the cost of storing data (in any format) has fallen dramatically, at the same time data production technology (such as sensors and wearables) has become cheap, and technologies that allow one to manipulate and manipulate data stored by organizations are now embedded in standard software, As a result, practitioners can quickly extract insights from their data and use them to improve organizational performance.

On the other hand, academic researchers have begun to study the use of big data within organizations and its impact on performance (Rifkin:2014). Research in this field has developed on two main aspects:

First, identify the ways organizations have used their big data to improve their performance. As a result, organizations tend to adopt new “data-driven” strategic decision-making models across different business functions due to their improved ability to exploit their big data. Second, to determine the impact of data-driven decision-making models on business performance, finding that organizations that use big data to guide their planning and decision-making functions perform better than those that don't. More specifically, these companies were on average 5% more productive than their competitors in the same industry.

So big data (and associated analytics techniques) underpin talent analytics (as a separate sub-domain of business analytics) as a set of methodologies that allow one to identify patterns in workforce data to manage workforces, drive changes and ultimately create value (Marler & Boudreau 2017) .

Research Objectives

This research is concern of the impact of big data analysis on talent analysis for private sector employees, through :

- To identify the common big data analytics systems.
- Illustrate a number of case studies on “How talent analytics can improve organizational decision-making.”
- Indicate the opportunities available for talent analytics by using big data analytics systems.

Methodology

In order to process and analyze information on this topic, and reach credibility and reliability in solving the basic research question, which is, what is the impact of big data analytics systems on talent analytics? the descriptive analytical approach has been relied on describing and interpreting the phenomenon in question, and population of research is consists of Americana listed restaurants In Egypt: they are (Pizza hut, Hardees, TGI Fridays, KFC, Tikka, Grand cafe, Costa Coffee, Baskin Robbins, Fish market), and applied as the Americana Group is one of the most successful groups in the Middle East.

Literary Review

Previous studies are dealt with by clarifying the conceptual framework for research variables, and then deal with the impact of big data analytics on talent analytics.

Conceptual Framework

The research is consisted of big data and talent analytics as following:

Big Data

Big data is a commonly used terminology for large amounts of data produced by sensors and social media platforms, in addition to big data can be different of formats such as structured or unstructured data, although it is indicated that unstructured data (i.e., data whose datagram is basic is not clear) is the most common type of big data. (Dedic & Stanier:2016)

Generally, big data is defined with the help of its characteristic of 3V's which represents volume, velocity, and variety (Akter et al: 2016), volume refers to the amount of data produced by different sources such as social media, business transactions and the Internet of Things, and velocity is In which data is produced, while variety refers to a variety of formats, in addition to this, other dimensions of big data have been defined, namely variability and complexity (Kwon & Sim: 2013), and variance refers to the frequency of data (that is, it can be either daily or hourly or in real time), while complexity refers to the fact that multiple data sources make it difficult to work with them due to the disparate data schemas that underpin data collection. Big data management the concept of "Data Lake"

has become very popular, data lakes allow companies to store several types of data at a low cost, and are very useful for insight discovery. Instead of analysis, it can therefore support advanced analytics and reporting activities (which usually require a data graph), and there are big data types including structured data such as MySQL, Oracle, and unstructured data, videos, chat messages, emails, and network tweets. Social media, PDF, Word and other semi-structured files, which are a mixture of the two types, and are closer to organized data, but they lack organizational structures such as tables and databases.

Analytics is a term that is becoming more popular as the concept of big data has gained traction in the business world, while the term tends to be used as a synonym for big data, but the two terms are actually very different. INFORMS There are three types of analytics relevant to organizations: descriptive analytics, predictive analytics, and prescriptive analytics (Scenario). Descriptive analytics explore patterns in data and use statistical analysis to summarize and visualize data. On the contrary, predictive analytics is a group of techniques that They can be used to predict future outcomes based on historical data through machine learning models. Forecasting are the main tools of predictive analytics. Finally, discretionary analytics relies on optimization, simulation, and inference-based methods to model alternative scenarios and their impact on business outcomes (Nocker & Sena: 2019).

The study (Najat Marei: 2019) indicated the importance of analyzing big data in the future of businesses that worked on: increasing the competitive advantage and contributing to rationalizing decision-making, as well as clarifying a

comprehensive view of the organization as well as developing the organization's strategy, supporting the preparation of integrated reports more effectively, improving The ability to manage risks, as it affects the increase in the organization's profits and the provision of better services to customers, as well as enhancing business intelligence to identify important data for the sector, which is reflected in directing future decisions and the efficiency and accuracy of predictive analytics, as it seeks to reach an understanding of the behavior of employees as well as customers.

Talent Analytics

Organizations' interest in their employee data is not new. Although the label 'talent analytics' itself is new, the intellectual precedents for talent analytics can be traced back to the concept of 'scientific management', although the big push for talent analytics stems from a growing interest in evidence-based management. that is, making a decision based on the use of evidence from multiple sources. Talent analytics can also be used to measure the return on investment in specific areas, take advantage of them, and thus can provide senior management with key facts that can help in developing strategy. In this regard, we find that one of the main benefits of analytics Talent is the fact that it eliminates the "gut feelings" that may drive decisions at a senior level (Guenole et al. 2017), regardless of talent classification (whether leadership talent, key talent, core talent, core talent, etc.) Support Talent.

Ultimate talent analytics aims to do the identification of patterns in order to predict alternative scenarios that can inform

strategic decisions (Levenson 2015), i.e., organizations may have policies to increase the ethnic diversity of their workforce. In this context, talent analytics can help identify a range of potential measures that might increase diversity and assess its future impact on employee turnover for example, this would be very different from what metrics and KPIs do that only capture the present moment (i.e., whether the number of employees from ethnic backgrounds has increased) and cannot assess their impact on future performance.

Select (Davenport et al. 2010) Six sub-areas of talent analytics: Human-Capital Management i.e., helps determine the optimal team composition (in terms of skill and knowledge mix) that includes Human-Capital Facts Concern about what are the key indicators of the overall health of my organization? and Human-Capital Investment Analysis, i.e., what are the actions that have the greatest impact on my work? As for Analytical Human Resources: It can help identify performance drivers at the departmental level and their contribution to overall performance, as it is concerned with what Which units, divisions or individuals need attention? Workforce Forecasts: Allows forecasting of the impact on organizational performance of alternative workforce scenarios i.e. How do I know when to allocate or reduce staffing? The Talent Supply Chain Used to make decisions about employees (and the talent supply chain) as well as related processes, i.e., how should my workforce adapt to changes in the business environment? The Talent Value Model: Why do employees choose to stay with my company or leave?

However, there are other areas in which talent analytics has been deployed effectively: Recruitment, Training and Development, Performance and Compensation, Employee Engagement and Motivation.

The interest in talent analytics has been driven by a number of factors (OrgVue: 2019):

- a) The widespread use of analytics in marketing, finance, and other business functions has led to increased awareness that data exploitation can help create value.
- b) The availability of inexpensive systems makes data collection, storage and processing straightforward and attractive.
- c) The increasing use of metrics among HR teams has led organizations to invest resources in developing quantitative skills among HR professionals.
- d) That the use of analytics may help them manage uncertainty as it can help identify the source of risk, design mitigation strategies and ultimately align human resource management practices with performance.

In addition, there are a number of critical areas related to the use of talent analytics that must be addressed before organizations can take full advantage of the opportunities offered by (Kamp:2017) the relationship between business performance and talent analytics, data quality, and the talent analytics function.

Literature Review

Other saturated applications, the previous example, working business references and reviewing answers practices,

factor analytics appears to have the greatest impact in large organizations investing in technology and its emergence in favor of analytics (Falletta : 2014), as a 2016 study by SHRM showed that 79 % of organizations with 10,000 or more employees have data analytics roles within HR, in addition to this comes best and best practices in tourism, technology, branding, or data, such as high-tech, bio-tech and retail operation.

It highlights some of the current applications of talent analytics and provides some real-world examples of how companies use different types of analytics, especially predictive analytics. Predictive analytics are the most common type of analytics used by HR departments in several contexts such as employee turnover modeling and employee engagement as following:

- Employee Turnover. It is important to understand the factors that make employees likely to leave the company, because it allows a person to plan for hiring as well as identify a number of actions that can be taken to retain key employees, and thus many large companies have used predictive analytics to model employee turnover (the so-called “flight risk”). using a variety of data such as employment data, recruitment, performance, location, etc. These models can be estimated at the individual and/or group level and tend to return the degree of risk as well as a number of factors (individual and institutional), which are closely related to the likelihood of leaving the organization. IBM, Nielsen, Unilever, and Experian have done so, and managers have used these models to build retention plans for key employees. Managers at Experian even

used the predictive model to test hypotheses about optimal team size and leadership of the organization's structure; More importantly, they decided to customize the model for the different regions where they work. Another interesting app is the one from Cisco, which has developed models of talent flows and looks at where a company's employees were hired and where they went when they left.

- Employee Engagement. Another common area of focus for talent analytics is employee engagement. Organizations typically assume that more engaged employees tend to be more productive, and as a result a number of companies have attempted to design different aspects of employee engagement and identify their drivers. For example, E. ON developed a model for absenteeism, while Shell modeled the relationship between engagement, leadership and safety (the main driver of business performance). Shell research has shown that employee engagement is the single largest driver of individual performance, and has established a causal relationship between engagement and sales in different parts of the business.

- Recruitment. The challenge in this field is to determine the best set of tests that allow a person to identify candidates who can contribute the most to performance once they are hired. This is an area that has mostly benefited from predictive analytics. Rentokil Initial collected data on performance drivers and used it to devise automated assessment techniques to support hiring globally. Another interesting application of predictive employment analytics is from Opower, which was able to determine the number of candidates in A panel is

required to ensure that the selected candidate was likely to perform better on the job.

- Network analysis. This is a set of tools that allow an individual to map communications between members of employees and/or teams within organizations, these tools allow an individual to identify hidden networks that may be key contributors to performance and take actions that may enhance communications for example some organizations use a combination of qualitative data and social media data to identify these networks. For example, AB Sugar has used network analysis for four years to support collaboration between key specialist groups such as chemical engineers and agricultural managers. The company has also created communities of practice that share expertise and has used analytics to create communities and measure the value they create.

- Sentiment analysis. Some companies use analytics to perform sentiment analysis to test the “moods” of the workforce and detect early signs of potential problems. This usually means linking public data such as posts on internal social media to other data, and JPMorgan Chase analyzes unstructured data from internal social media platforms. and employee surveys to come up with a point of view at any given time you are feeling among the workforce, Unilever also conducts a sentiment analysis by correlating data from internal surveys with information posted by employees and candidates on Glassdoor (the website where current and former employees review and manage companies Anonymously), in addition to Hitachi's data systems using machine learning to understand employee

reactions to the transition, the analysis involved modeling various hypotheses about the goals and incentives, the implications of the company's diversity program, and what financial provision should be made for restructuring.

- IBM has built a number of "knowledge" talent applications based on a machine learning platform (IBM 2016). Blue Matching uses AI to match people's skills with internal job opportunities and development programs, and the algorithm can also identify opportunities that people might have overlooked or felt they were under-qualified to take. Tools like blue matching are used to improve workforce planning, and IBM can also use the system to 'push' jobs or training programs, thus encouraging people to develop the skills they need for future growth. Attract and hire, for employee engagement, retention, development and growth, and for services to support ongoing interaction with employees. More advanced AI tools allow organizations to use video interviews and AI facial expression scans to understand potential engagement. Unsupervised neural networks can analyze interview recordings and topics in employee surveys. Finally, a virtual assistant can help prepare the employee.

- The study (Mohammed Mohsen et al.: 2020), which aimed to study the role of artificial intelligence and big data in education in light of sustainable development, indicated that it encouraged interest in research on the use of artificial intelligence and big data, as well as training in the software industry for artificial intelligence and its application in educational fields. And the establishment of an electronic

system for teaching robots programming and knowledge bases and their use in the educational process, and finally developing a strategy to enhance big data, and identifies the authorities and institutions responsible for collecting, analyzing and processing. The study also focused on achieving big data for sustainable development through: On the data, participating in building cooperative relationships that benefit in building policies and making decisions, integrating big data into indicators of sustainable development to support the implementation and follow-up of action plans, as well as creating guiding rules for management and the ethics of dealing with big data.

- through the previous study, (Kaplan, 2013) study emphasized the importance of using and analyzing big data in the field of retail trade, automobiles, health care and financial services, where in the field of retail customer information such as website, browsing patterns, previous purchase behavior and responses to promotional offers are used in order to Notification of pricing changes and increased chances of customer retention and cross-selling. In the field of automobile trade, it is through the sensor to improve the performance of cars and generate predictive maintenance information. In the field of health care, big data is directed in research to identify predictive reactions in clinical trials, in addition to The field of financial services, which aims to assess the profitability of the product and the customer, as well as predict fraudulent behavior and monitor compliance with money laundering regulations. The study was also concluded to prove that organizations that work to

integrate data and related business analytics effectively will achieve productivity gains by 5-6%.

Discussing Case Studies

From these case studies, a number of features can be identified that are common to all talent analysis projects (Turnover, Employee Engagement, Recruitment, Network analysis, Sentiment analysis) discussed above.

First, unlike other types of business analytics, talent analysis projects require a good understanding of the links between business performance and individual/collective performance (Levenson 2015). Importantly, the model needs to consider the organization as a system in which performance drivers are articulated with channels that can have a positive impact on performance (Kamp 2017). In addition, the model should show how specific HR issues (such as workforce retention or planning) lead to business outcomes such as profitability or/and productivity growth (Levenson & Fink 2017). In turn, this model allows the individual to identify hypotheses that can be used To lead a talent analytics project, this differs from the approach traditionally associated with analytics (for example, looking for patterns in data that allow an individual to build hypotheses on behavior later), but is actually key to the success of talent analytics, as its ultimate goal is around driving business performance, Such a goal is difficult to achieve without a clear understanding of what drives performance, and in practice Levenson (2015) suggests starting from defining the main business goal(s) to achieve and then identifying the levers through which talent analytics can improve performance.

From the experience of the above organizations, causal links and hypotheses are first identified and then verified again on the basis of the results (Levenson 2015). This process is **Second**, mapping talent analytics results to organizational outcomes can be difficult, from HR results to specific talent analytics projects (turnover, employee engagement, recruitment, network analysis, sentiment analysis) and potential performance outcomes. (Sales Performance, Profitability, Customer Satisfaction, Innovation, Efficiency), while identifying organizational outcome drivers from the list of talent analytics results is rather complex: for example, it can be said that the compensation structure It may simultaneously affect productivity, sales performance and production capacity. However, the direction of the effect may be different: for example, an increase in compensation may reduce productivity in the short term, but an increase in sales performance may be large enough to determine increased labor costs. In the short term, therefore, the potential relationships and the effects of feedback will not be apparent at all, resulting in that the actual impact of talent analytics on organizational performance may be underestimated or overstated, thus extracting insights from data is only the first step, and is in fact valuable as long as it is translated into actions that can improve business performance (Rasmussen & Ulrich 2015).

Third, most organizations treat talent analytics less as a resource than the ability to contribute to value creation. Interestingly, this is in line with the existing literature on analytics and performance that uses a dynamic ability approach as a theoretical lens through which to analyze the contribution

of analytics to organizational outcomes (Teece 2018). If we use this theory, it is important to note that talent analytics creates value that requires capabilities that are critical for this purpose: learning capability (where organizational learning must support the implementation of talent analytics projects across the organization), and coordinating capability (where you need Different departments need to coordinate their activities so that talent analytics can create value), infrastructural capability (the ability to store data) and technical capability (the ability to process human resource data) (Teece 2018), and then this is reflected in Challenges to consider include: availability of data, analytical skills, support from senior management, and access to core IT capabilities.

In addition to the above, it should be noted artificial intelligence and talent analytics, where automation is an important component of artificial intelligence (Acemoglu & Restrepo 2017) as well as other important aspects of artificial intelligence, including: deep learning and machine learning, which are closely related and support most Artificial intelligence techniques, machine learning is a designation for a number of algorithms that allow a person to either detect data patterns (through unsupervised machine learning) by learning the algorithms from the training data set and models make predictions using the training data set which is usually an analysis Regression, regression analysis, and typically classification which are supervised machine learning models or predict outcomes (using supervised machine learning) where there is no training data and the algorithm decides what should

be the input and output of the model. An example of these types of models is clustering analysis. In the context of talent analytics, unsupervised machine learning can be useful to support recruitment as machine learning can be used to analyze social media posts and identify applicant profiles, which may not be advertised in a resume. , unsupervised machine learning can also be used to recommend jobs based on previous searches and publications (LinkedIn is an organization that has used this approach to recommending a job), however if the purpose of a talent analytics project is to determine the contribution of training investment to business volume a subject regression model may be Supervision is an option where there is training data that can help the individual choose the outputs (business volume) and inputs (training and other controls) for the process, as indicated by (Mohammed Mohsen et al. 2020) that there are several divisions of artificial intelligence, including: experience systems, neural networks, genetic algorithms, Intelligent agents, each of which deals with big data in different ways, explain that another division is narrow and strong artificial intelligence. And the supernatural.

Finally, we find that the role of big data and artificial intelligence has a positive impact and brought about a significant change from the usual traditional form. It has also become one of the modern transformations of emergency changes as a result of strong external factors, including the global crises, especially the current Corona crisis, which made big data a basis in transactions and decision-making as a result of an uncertain work environment. And the increasing risks, as well as internal factors stemming from management and its

strategies, especially sustainable development, which most organizations are currently focusing on, as well as talent analyzes to contribute to creating an added value for the organization and dealing with it in terms of attraction, development and preservation.

Search Limitation

- Objective limits: The impact of big data analytics on talent analytics.
- Spatial boundaries: Management of Americana restaurants in Egypt.
- Time limits: This research was applied during the month of May to July 2021

Results

The Kuwait Food Company (Americana), whose strategy depends on speed, innovation, integrity, customer care, excellence and cooperation, has been studied during the current decade for talent analytics through big data. Using the ERP and Ramco program, and the analysis is done manually or using the Excel program, which is huge data, the size of which reaches more than 10 thousand workers in just 3 years, and also various data in terms of demographic data, in addition to that the degree of reliability reaches more than 90 percent, and it is also complex to some extent, the data is related to some variables such as turnover or performance.

It was also found that the degree of analysis and the degree of artificial intelligence followed were only reflected in what happened? As the reports are a standard tool, and are done on a monthly and annual basis, they are ad hoc reports, but they

are done in a proportional manner to show the change only. The company and educational institutions or through the recruitment process, and analyzes help in clarifying the most likely to happen during the coming periods, especially the turnover rate of workers and thus reflected on the Manpower plan as well as dealing with it to reduce the percentage of employee turnover to less than 50%, and ultimately affect sales, quality and workflow In restaurants, and the results are compared periodically, whether monthly or annually, they are analyzes that reflect a description and explanation of the current situation and may be relied upon to predict future events, the data follows the form of HTML, the type of data that is analyzed follows the form of regular data ERP, Oracle and Ramco only without addressing Unorganized data such as videos, chat messages, Word, or semi-systematic data such as tables and databases.

There is formal and informal communication and work to achieve a balance between organizational goals and employee goals for more than 90% of employees, and a transfer allowance, meal allowance and basic salary are provided, and thus reflects the Model Turnover, which includes effective communication between employees and management, and employee awareness for goals that are compatible with the goals of the organization, in addition to what is provided by the company.

It needs to improve for the best that can happen and develop scenarios to deal with it, as no fixed standard has been defined on which the results will be measured more reliably and objectively, and analyzes need to raise the level of improvement by developing scenarios

The Impact of Big Data Analysis on Talent Analysis

A talent analytics project contributes to: employee turnover modeling, talent management, workforce planning, engagement, recruitment processes, reward and compensation, and this is reflected in the organization's results in terms of sales performance, profitability, customer satisfaction and efficiency.

Big data contributes to any of the following: selection and recruitment, evaluation and development, information, learning and knowledge, strategy, efficiency, performance, periodic reports and dash board, but the analytics lacks to identify the basic data that is prepared in the light of advanced analyzes represented in decoding employee participation, Build recruitment plans Promote managerial excellence Measure the impact of training Empower talent mobility Develop predictive models for recruitment, retention and attrition Design employee benefits and then identify research and consultancy through understanding team dynamics Improve representation of diverse talent Optimize recruitment processes Design the organization

The correct prediction ratio through data analysis depends on the ratio of 50%: 50%, the ability to retain employees is approximately 60%, but the analyzes do not address the cost of recruitment and training, the cost of knowledge that has been lost

We recommend clarifying HR analytics processes: employee data, business performance data, social media, and then data integration, business question, paid data, and data collection and preparation, thus retaining big data, and relying on statistical analysis

We recommend some analyzes that benefit the company, including: cluster analysis, where the understanding of hidden group patterns, decision-driver analysis, which is concerned with understanding hidden relationships, risk analysis that expresses an understanding of possibilities, and finally forecast analysis, i.e., understanding future patterns.

Conclusion and Recommendations

This paper explored the relationship between big data and talent analytics, assuming that big data may affect talent analytics, such as any organization that HR teams produce large amounts of data in the course of their routine activities; This data can be used to develop standard HR metrics that can be exploited in a variety of ways to provide information on how value is generated via talent analytics, so a broad overview of talent analytics has been presented and used in a number of organizations.

A key factor is that if used in an appropriate manner, talent analytics can help an organization's senior management team align HR strategies with value creation. Measures that can support employees in an ad hoc manner. Case studies analyzed show that large organizations use talent analytics to address a number of standard HR issues (such as retention, planning, and engagement). However, a strong theoretical framework on how talent analytics creates value has not been clarified could be hampered by a lack of data, as most data on talent analysis projects belongs to organizations that have sponsored projects that may not be interested in evaluating the evidence.

Current practice around talent analytics suggests that there are three important factors that smooth the relationship

between performance and talent analytics. This includes technical knowledge of analytics, access to data, and a good understanding of how to use analysis results to improve performance. However, more research is needed to determine the extent to which these factors influence the relationship between performance and talent analytics, and more importantly what strategies organizations may put in place to reduce the negative impact that each of these factors may have on organizational outcomes, and also have a positive impact. strong on her.

It is worth noting that there are many tools and techniques that are used to analyze big data, such as: Hadoop, Map Reduce, HPCC, but (Hadoop) is one of the most famous of these tools, and (Hadoop) is an open source software program or platform written in a language Java is used for distributed storage and processing of big data, meaning that this big data is stored on multiple devices, as well as IBM Db2 Big SQL to speed up operations in large data environments with low latency support using hybrid SQL on Hadoop engine for custom and complex queries. You can also connect different sources using a single database connection, as well as IBM Big Replicate for Hadoop enables enterprise-wide replication of Apache Hadoop and object store to replicate data as incoming sequences, so that it does not have to be completely written and closed before conversion, plus IBM Analytics for Apache Spark In which end-to-end performance monitoring can be introduced from Db2 for z/OS to monitor and manage performance, custom methods can be replaced with best-practice technology

that improves DB2 availability and reduces overall system costs, as well as other programs HTML, XML, HRXML, text, comma .

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