

Impact of Human Resource Analytics on Organizational Performance: A Review of Literature Using R-Software

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Abstract:

This study tries to explore various aspects of HR analytics and how it impacts the functioning and performance of an organization. A systematic review of available literature has been done to investigate into various facets of HR analytics. The exploratory research design was used in this research. Software R was used for qualitative analysis of literature. The analysis of literature has led towards that how frequently HR analytics is used for enhancing the performance of an organization. Though with the help of available literature it is not clear that whether HR analytics help in organizational performance or not. Clear decision cannot be made on the basis of previous literature. The analysis of this literature has explored the consistency of HR analytics with regard to organizational performance

Key Words: *HR analytics, Organization, Business analytics, Decision making, Data analytics*

INTRODUCTION

Human resource analytics is a concurrent phenomenon now days. The organizations are trying to improve the accuracy of decisions through data analytics. To improve the effectiveness and efficiency in the organization, there is a need to have farsightedness for future course of actions. Data related to every aspect of employees in the organization should be well assessed, evaluated and analyzed to make appropriate decisions regarding employee's issues. Analytics orientation will give an edge to an organization on their counterparts and will add value to it. The organization failing to assess previous data related to people have possibility of making wrong decisions on workers affairs.

Organization is to combine all organs associated with this and all have specific functions. Each function contributes to attain the objective of organization. It is an essential part of human life for accomplishment of established goals (Hargrove, 1915). The organon the ancient Greek word is the originator of term organization. This is a purposeful, open system which has both formal and informal structure. This is defined as a set of activities done in order to accomplish set objectives (CRIEPI Report, 2006).

According to Barnard, "a formal organization is that kind of cooperation among men that is conscious, deliberate and purposeful". According to March & Simon, "organisations are assemblages of interacting human beings". On the other hand, Etzioni views "an organization as a social unit to seek specific goals" (Dzimbiri, 2009:11). According to Pareek (1997), evaluation of human resource development functions is not being done; the related component and practices of this are left. The internal working of an organization and its impact on performance of organization is hardly assessed.

Singh (2000), has explored that organizations working in India did not believe that investment made in human resources processes have to do with performances. But it was also found a

positive correlation between Human resource practices and organizational performances. It shows if human resources will be considered important dimensions definitely it will help in organizational performance.

HR analytics add value to the functions of HR department and improve the effectiveness and efficiency of every associated aspects of it. To add value in the organization analytics is a powerful tool that impacts HR practices and policies and improve HR functions. Analytics has interaction with much discipline like computer, engineering, science etc. (Angrave et al. 2016).

HR analytics can be defined as to understand relationship between performance of organization and HR practices. In case of effective HR practices it leads to employee satisfaction and provides strong foundation where decisions regarding human capital and business strategy can be performed. Analytics enabled organization bring precision in decision making. It is possible with the use of statistical techniques and experimental approach (Lawler et al. 2004).

HR analytics is: *“a methodology for understanding and evaluating the causal relationship between HR practices and organizational performance outcomes (such as customer satisfaction, sales or profit), and for providing legitimate and reliable foundations for human capital decisions for the purpose of influencing the business strategy and performance, by applying statistical techniques and experimental approaches based on metrics of efficiency, effectiveness and impact”* (Dooren, 2012).

Objective is to highlight the importance of efficient tracking and interpretation mechanism. What kind of planning is required and how it could be implemented and how it can be incorporated. This is the main concern for the top management in the organization. It is an integrated approach. It tries to pull multiple HR processes to handle strategic issues. Planning, evaluation and analysis of various HR functions for the employees is to improve effectiveness and efficiency etc. (Sannahet al. 2014).

HR analytics makes an organization enable to use the wealth of their employees and that will leads to the better decisions which automatically improve the organizational performance, HR analytics empower an organization to streamline strategic business goals with Human resource metrics. The function of HR analytics to provide inform an organization with valid point which helps in managing people and helping to achieve business goals efficiently.

LITERATURE REVIEW

HR Analytics literature has reviewed in this section and status of HR Analytics checked in context of organization performance. The literature depicts that HR Analytics has mixed impact or reaction to the organizational performance. This has been elaborated in this section of the paper. Current business analytics field are identified that are the issues of machine learning, data mining, social media and cloud which was found by Jalali and Park (2017). In the BA domain it has been visualized that a network analysis of the flow of collaborations among countries exists. Davenport, Harris, and Shapiro (2010), has explored that almost every company values employee engagement.

In today's era the purpose of using analytics in companies is to hold itself accountable for the various things which are associated with its staff as they know happier and healthier employees create better-satisfied guests. Also if they want to perform better and expects better performance from their top management which is their greatest asset and largest expense. They probably do well to favor analytics over their gut instincts. This is also stated by Muscula and Serban (2017) that is became a necessity to align HR and organizational strategies for competitive advantage, more and more organizations considering the HR department a value-added business partner. As argued by Levenson (2010), that analytics in the HR function on to this point has been treated as unusual competency, which has to be

applied often by various specialists residing in center of excellence than the large mass of generalists who do the bulk of the day-to-day work in HR.

Aral, Brynjolfsson and Wu (2012) explored that various practices are mutually correlated such as HCM, Performance pay and HR analytics. HR analytics and performance pay as a set of organizational practices that complements HCM. It was elaborated by Momin & Mishra (2015), that to have competitive edge on the competitors, organizations must use the HR analytics for the accuracy in the data and the real time information. Work force planning can be done easily and also helps in analyzing every aspect of the HR matrices by using HR Analytics. It is also found that there is a consensus in regards to the importance for HR analytics in organizations and that the HR analytical skills challenge is the main hindrance to implementation.

It is required that HR transforms itself while ensuring that the required skills from higher education sector must be attracted and also capacitate HR practitioners in numeracy and metrics, so that the concept of HR Analytics can be fully incorporated in the all levels of the HR process.

Molefe, 2013 very well said that the future of the HR analytics is that this field will continue to grow within organizations. The process of HR analytics is very straight forward and the purpose to use it to gain competitive advantage in the Industry. It is the peak time for HR managers to start focusing on business outcomes and must focus to improve employee engagement score or increase participation rates on their initiatives. According to Mondore et al. 2011, to make HR a strategic function in any organization proper implementation is the key initiative. According to Manuja & Ghosh (2014), the requirement of human resources was viewed as a strategic collaborative partner affecting outcome of the business. Analytics of raw data to useful information is covered under analytics which also covers the data generation, storage and conversions. It is however critical that HR analytics has an Integrated Approach.

It implies pulling in multiple HR processes to tackle strategic issues, e.g. in succession planning using HR analytics, the components of performance evaluation, analysis of input and output from trainings, engagement of the employee in terms of contribution, efficiency, effectiveness etc. should all be factored in a clinical and systematic manner. It has been argued that how analytics can operate in a data driven way but it has the advantage that it can be learned from what marketing went through those early years. It is never a simple step for some or many HR functions, a data driven approach for decision making has potential for HR to add, which further adds more value to business (Fairhurst, 2014).

To survive in the long run, Industries need to possess predictive analytics from Human Resource management. The usefulness of predictive analytics is wider and hence application in all related areas of HRM is essential. HRPA helps organizations in optimizing business performance as well as employee engagement and satisfaction. HRPA is a growing and very fast changing technology which has 100% accuracy in decision making for HR (Mishra et al. 2016).

According to Bassi (2011), Elevating the status of the HR profession and it is a source of competitive advantage for organizations that put it to good use which is held by HR analytics. There are various reasons for HR analytics is to improve individual and organizational performance not to prove the worth of HR. Sharma, Mithas and Kankanhalli (2014), it is also found that the business analytics can help on improve quality of decisions. However, it is not clear if business analytics can be used to improve the acceptance of decision in any way. The insight generation and decision making processes associated with the use of business analytics which is suggested by anecdotal research which often do not involve key stakeholders from functional areas who all will be responsible for implementing those decisions.

It was found that it is never being accepted in the organizations on acceptance of HR analytics. To have that acceptant top management need to convince effectively to all in the organization. Ramanathan, Philpott, Duan and Cao (2017) attempted to explain that on the basis of their analysis, they have *Tornatzky and Fleischer* (TOE) elements in the context of BA that have significant influence on BA adoption. They have come up with these findings that BA Adoption will help and influence environmental performance positively, level of adoption of BA moderates the link between BA adoption and performance, level of integration between IT and business strategies moderates the link between BA adoption and performance, trust in BA systems moderates the link between BA adoption and performance.

The major factor accepting HR analytics in the organization includes in the Analytical skill of an individual. HR Analytics was applied majorly big organizations and training and top management support was the few factors which led to the acceptance of HR Analytics. According to George and Kamalanabhan, 2016 the acceptance of HR analytics will be more if the technology adopted for analytics is user friendly. Gardner, McGranahan, and Wolf (2011), in their article have argued that HR analytics increases the value of organization. When human-resources and business leaders work together to address the root causes of problems and to pilot new ways of solving them, HR analytics succeeds at the same moment. The development of an intelligent business analytics platform is helpful to organisation.

The main purpose of the platform was to create such software environment where the latest algorithms and architecture developed within industrial or academic research can be incorporated efficiently into real business applications.

Two applications were implemented such as ITEMS (Intelligent Travel Time Estimation and Management System) and DecTOP (Decision Table Optimization). There are two related term HR matrix and HR analytics (Azvine, et al. 2003). Lawler, Levenson and Boudreau (2004) have distinguished 'HR Analytics' as separate from 'HR metrics'. HR metrics are measures of key HRM outcomes, classified as efficiency, effectiveness or impact while HR analytics are not measures but rather represent statistical techniques and experimental approaches that can be used to show the impact of HR activities. Research shows that top performing companies are three times more likely to be advanced users of workforce analytics than lower-performing companies. This indicates that the power of workforce analytics is the core driver of an organisations success (LaValle, et al. 2011).

It has been discussed in current scenario that the latest emerging fads is a paradox in itself which is HR analytics. It is predicted that HR analytics will definitely be failed initially but later will definitely add the value to the organization because there is lack of analytics in the HR departments.

The theory based academics started their human capital work with a theory they were testing not with a deep understanding of business challenges. Chief human resource officers with a clear business focus are still few and far-between. A journalistic approach to HR analytics will not be able to add value. Remember the "human" in human resources is more important than anything.

There must be training to HR people to have an analytical mindset to achieve goals by using HR analytics. There are probable results of HR analytics if it will not executed effectively and with proper planning and implementation (Rasmussen & Ulrich, 2015). Pape (2016) in his article have concluded that the popularity of business analytic solutions is expected to continue to grow in industry and academia over the next years. A more systematic understanding of the benefits and costs associated with creating new data items for business analytics is likely to play a role in this development.

RESEARCH METHODOLOGY

The research design of this study is exploratory in nature. The existing literature has been derived from various online sources such as Elsevier Products, Emerald eJournals, Indian

Journals, JSTOR, Sage Online Journals, Springer, Taylor & Francis Online, Wiley Online Library, Google scholar etc. The literature was searched with the help of various related key words like, business analytics, data analytics, HR analytics, people analytics etc. This is an interdisciplinary aspect which is also closely related to the business and IT. The data analytics is studied in IT also. Most of the articles have derived from Elsevier Products related to HR analytics. These papers were published in different journals of management. Eighty research studies from various double blind peer reviewed journals were found appropriate for this article. The qualitative analysis of existing literature is done with the help of R-software. The R-software which helps in word clouding, text search, data mining and helps in establishing correlation between text and terms.

“R Studio” a software package that allows users to import, sort and analyse text documents, PDFs, audio files, video files, spread sheets, databases, documents, bibliographical data, web pages etc. The qualitative analysis of articles available in these formats has been done. The results provided by R –software have been presented and concluded in the following section of the paper.

FINDINGS AND DISCUSSION

For the purpose of this study seventy four research papers on HR Analytics have been analysed with R-Studio software to draw word frequency cloud. This word frequency cloud has shown most frequently terms used in various research articles. The results are presented here in the form of a word cloud.

Figure 1: Word Cloud of Most Frequently used words



(Source: Research Output)

The above word cloud shows that many studies have been done in the areas of business and data analytics where it is evident that less number of studies were conducted on human resource analytics. This word cloud shows that there is a gap in the area of HR analytics. This study suggests that more exploration is needed in areas of HR analytics.

The following table shows the ten most frequently used words and the number of times they have been used in the literature.

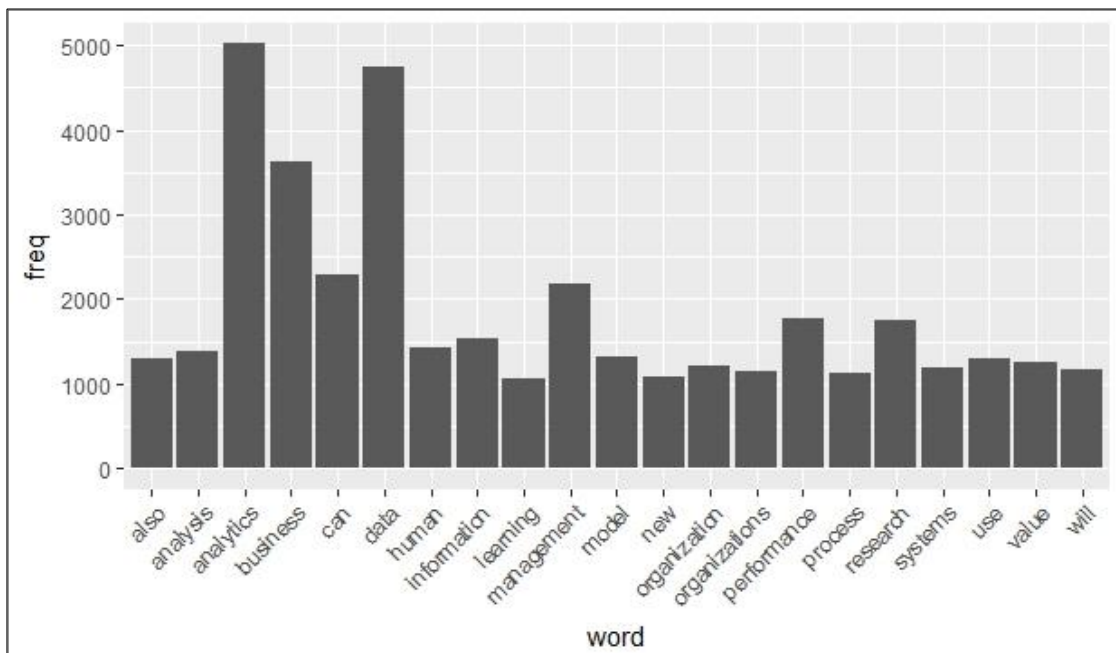
Table 1: Ten most frequently used words in the literature

Word	Length	Frequency
Analytics	9	5017
Data	4	4756
Business	8	3627
Can	3	2296
Management	10	2185
Performance	11	1764
Research	8	1743
Information	11	1534
Human	5	1418
Analysis	8	1381

(Source: Research outcome)

The above table highlighted that analytics secure first position in terms of used terms in various literature and human stands at ninths which clearly indicate that in areas of HR Analytics there is a gap in literature.

Figure 2: Frequency plot of most frequently used words in the literature



(Source: Research Output)

The above graphs also highlighted that the terms like analytics, data, business and management are most frequently used terms in literature and here also gap is visible in area of HR analytics. This frequency plot is derived using R-studio software.

Table 2: Degree of higher correlation of different words with Analytics

Analytics	Correlation	Analytics	Correlation
Age	0.83	Degree	0.77
Interest	0.82	Exactly	0.77
Reporting	0.82	Finance	0.77
Apply	0.81	Fulfilling	0.77
Disciplined	0.81	Healthy	0.77
Hallmark	0.81	Influence	0.77
Outdated	0.81	Interested	0.77
Rising	0.81	Lessons	0.77
Applying	0.80	Moment	0.77
Possibilities	0.80	Organization	0.77
Satisfied	0.80	Start	0.77
Achieved	0.79	Started	0.77
Existed	0.79	Absenteeism	0.76
Involved	0.79	Application	0.76
Landscape	0.79	Financially	0.76
Methodologies	0.79	Illness	0.76
Barriers	0.78	Influencing	0.76
Bit	0.78	Intensity	0.76
Currently	0.78	Mature	0.76
Expect	0.78	Mechanism	0.76
Financial	0.78	Propositions	0.76
Insufficient	0.78	Really	0.76
Learned	0.78	Television	0.76
None	0.78	Illness	0.76
Reports	0.78	Financially	0.76
Subsequently	0.78	Absenteeism	0.76
Andor	0.77	Application	0.76
Conducting	0.77	Financially	0.76
Degree	0.77	Contingency	0.75
Exactly	0.77	Driver	0.75
Finance	0.77	Execution	0.75
Fulfilling	0.77	Formulated	0.75
Healthy	0.77	Health	0.75

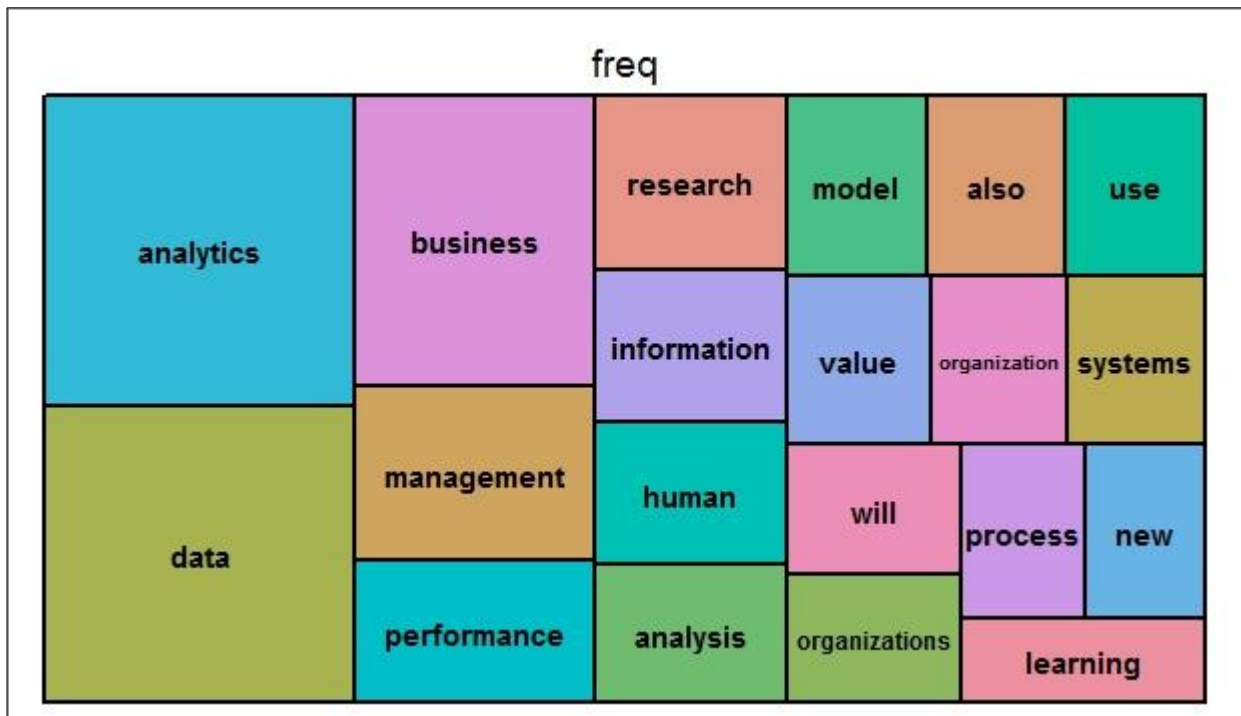
Influence	0.77	Lacking	0.75
Interested	0.77	Lot	0.75
Lessons	0.77	Month	0.75
Moment	0.77	Newest	0.75
Organization	0.77	Noticed	0.75
Start	0.77	Objects	0.75
Started	0.77	Organisations	0.75
And or	0.77	Rations	0.75
Conducting	0.77	Newest	0.75

(Source: Research outcome)

The data has been derived from R software where degree of correlation has been calculated with term analytics. In the above table 0.75 level and above is presented only.

The tree map is extracted from R software using 74 different articles related to HR analytics. It shows that in existing literature analytics, data, business and management have been used prominently. HR analytics needed to be explored in relation to the performance of an organization.

Figure 3: Tree Map



(Source: research Output)

By critically reviewing the selected literature on HR analytics few major findings are as follows

First, the analysis of selected literature revealed that studies have been done on analytics but there is a gap in HR analytics which can be explored and studied in future researches. There many dimensions related to HR analytics can be included and studied.

Second, it also highlighted that data analytics has been done in various businesses and may or may not be related to the organizational performance.

Third, here consistency has been found in analytics related to business and data.

Fourth, here no direct relation is found in HR analytics and performance of organization.

Fifth, here it is evident that analytics is related to the performance but how it has and with which aspect needed to be explored through empirical research.

Sixth, in all the extracted table and graphs it is evident that the terms analytics is closely related to the business, data, management, organisation, performance, human, information etc. Here conclusion can be drawn that analytics is related to the organisations closely.

CONCLUSION

HR analytics is a new area to be explored in human resource management domain. Decision making is a crucial aspect in every organisation. It needed much investigative approach and critical observation of past events to make any decision. HR analytics is a tool to improve the performance of decision making related to people in the organisation.

This study has been done to understand the HR analytics and does it has any relation with the performance of organisation. It revealed that there is a gap and inconsistency in existing literature related to HR analytics. It helped to understand inconsistency in HR analytics and with the help of this findings future course of action can be decided and model can be proposed to explore various dimensions of HR analytics. The existing literature shows that analytics is in consistency with data and business. Here further studies are required to explore HR analytics and how it affects the performance of an organisation.

Studies suffer from limitations and conducting study on the basis of secondary sources has many limitations these are as follows:

- The data used for the purpose of the study may or may not be authentic or accurate.
- The data can be vague which cannot be used to draw any conclusion.
- It is not possible to decide that whether the sample used for the study purpose is appropriate or not.
- Author of the paper has lack of control over data quality used for this study

There are future opportunities for conducting research on HR analytics in many other organisations such as IT, Telecom, Manufacturing, Banking, Hospitality so on. In these studies the impact of HR analytics can be assessed on performance of these organisations and how analytics has changed HR policies across the industries in India. Scale of the study may be big or small depends on nature of the study. Big sample size can be used in future studies so that findings of the study can be generalized.

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