

Is Artificial Intelligence Our New Mentor In Industry

5.0

Preeti Sharma¹, Dr. Shikha Gera² and Dr. Mansoor Ahmad³

¹Research Scholar, Department of Management and Business Studies
Jamia Hamdard, E-mail-ID preetig306@gmail.com

² Assistant Professor, Department of Management and Business Studies, Jamia Hamdard
Corresponding Author, Email-ID: drshikhagera@jamiahamdard.ac.in

³ Assistant Professor, Department of Management and Business Studies
Jamia Hamdard, Email-ID: drmansoorahmad@jamiahamdard.ac.in

Abstract

In today's cut throat competitive world, it is very essential for any organization to adopt latest tools and technologies and Human Resource Analytics is one of them. This research paper has the aim to identify the advantages as well as challenges to deploy different HR analytics tools. A comprehensive literature review has been conducted to gather effective information regarding use of HR analytics within business. And also few real life instances of application of these tools have been discussed in the paper.

Keywords =HR Analytics, Technology in HR

Introduction

In the last two decades, Business Intelligence and analytics has become significantly important within business communities across the world (Ahamad, 2020) As per previous surveys report published by "Bloomberg Business week" or "IBM tech trends report", it has been found that, most of the companies have used any form of business intelligence within their business and business intelligence has been referred to as one of the most trending technologies at that point (Chen et al., 2018). Business intelligence applications are considered as the fundamental part of HR analytics within a business organization, due to its ability to connect data sources and deliver business insights for HR professionals with integrated reporting systems based on HR data.

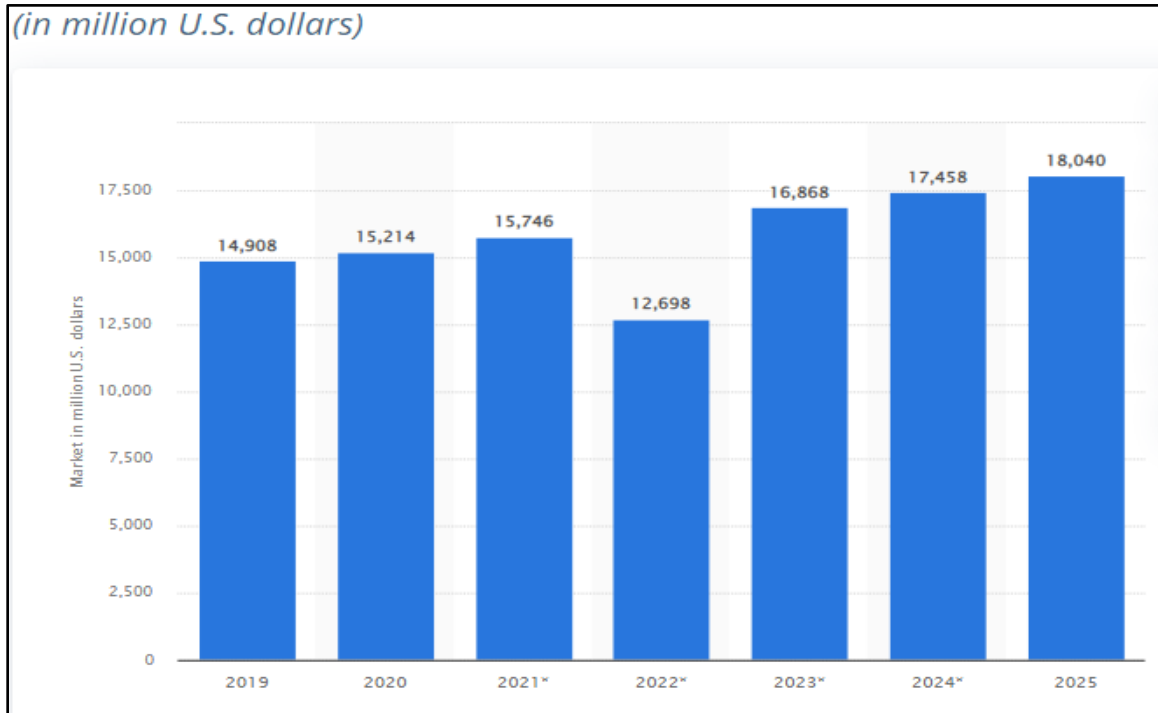


Figure 1: Market Size of “Business Intelligence” and “analytics software application” Worldwide

(Source: Statista, 2022)

As per the above figure, the overall market size of “business intelligence” and “analytic software” is expected to increase from 15.2 billion in 2020 to 18 billion in 2025. This business intelligence software helps organizations to meet their corporate goals in an easier way (Statista, 2022). Different Human Resource analytics tools are there, which can be implemented by the HR professionals in order to make effective decisions within an organization and make future estimation for a specific business scenario.

The main purpose of development HR within a business is to address different organizational challenges and add value to the relationship of the organization with its employees. Over the years, the data used within HR practices have become larger and the traditional HR management system used within an organization is not sufficient to manage these big and complex

data sets. As started by Shamimet *et al.* (2019), use of Big data within HR management and business processes enables different opportunities along with some novel complexities.

Research Objectives

This research paper will address different advantages of HR analytics tools within a business structure along with some challenges.

- To identify the advantages as well as challenges related with the implementation of Human Resource Analytics in a business setting,
- To examine the real world examples of the use of HR analytical tools.

Literature Review

HR analytics within a business process are effective to understand as well as interpret a large scale of data related to their employees, who are the key driver of their business growth. Moreover, HR analytics tools within a business area are effective to identify various underlying trends and patterns within the large volume data related to HR management (Shrivastava *et al.* 2018). Examples of such data are employee's performance data and business organizations use HR analytics tools in order to identify any enhancement of performance within a team. In order to identify and predict all the needs of an organization as a whole and its employees, HR professionals use HR analytics tools to engage a better HRM system, by changing the traditional approach (Shrivastava *et al.* 2018). HR analytics tools are effective for prioritizing HR activities based on their overall impact, utility as well as return on investment to the organization.

HR analytics tools used by HR professionals within business organizations make their decision making process more transparent. As stated by Garcia-Arroyo and Osca (2021), the use of data within the HR management process of a business structure has evolved by time, ranging from basic metrics to big data through HR analytics tools. HR analytics includes an effective analysis of data gathered from internal as well as external sources and manipulated with IT tools. AS per the study conducted by (Saxena *et al.*, 2021), Power BI is most acknowledged HR Analytics tool by HR professional followed by Tableau, R, Python.

This system of decision-making process is effective to enhance organizational performance as a whole. With the use of Big data through HR analytics tools are effective to “store”, “process” and “retrieve” information from various sources, with the presence of business intelligence solutions (Garcia-Arroyo and Osca, 2021). As a result, it can be stated that use of Big data through HR analytics, combined with business intelligence solutions are important within a business for better knowledge management. As a result, it can be stated that the main aspect of using “Business Intelligence Solutions” and “HR analytics” tools within a business is to acquire critical insights from structural data collected from different enterprise systems and analyse them for future use, in commercial database management systems. Business Intelligence solutions are effective to combine HR data related to employee’s performance or any data related to job applications and then deploy HR analytics to find out the hidden patterns and text analysis.

HR Analytics and Its Techniques-

“Human Resource Analytics” is also called “People Analytics” and it refers to the engagement of analytical techniques such as data mining techniques, predictive analytics, and contextual analysis in order to help managers and HR professionals within a business for making a better decision, which is associated with their workforce structure.

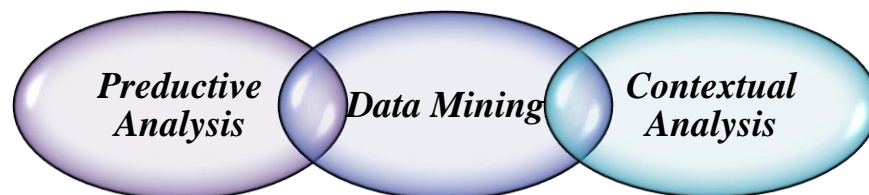


Figure 3: Different HR Analytic Techniques

(Source: Shrivastava *et al.* 2018)

Predictive Analysis

Predictive analysis within the HRM of a business organization is effective to develop a step-by-step process, in order to handle data with large volume. This system is also effective to utilize the data in order to achieve meaningful insights for making managerial decisions, which improves organizational performance (Ghosh and Sengupta, 2017). Moreover, in order to develop predictive analysis within an organization a basic knowledge of statistics is required, though it is important to project predictive analysis as a logical tool for a general understanding.

Data Mining

Data mining is another HR analytics technique in order to identify underlying patterns and trends within a large and complex data set. Data mining is a small part used for predictive analysis tools in order to find patterns and trends to determine future tentative actions. As per study, under the predictive analysis process, explanatory patterns are identified with the help of past events. However, the main questions associated with the prediction model are “What will happen in future and why?” (Giermindlet *al.* 2021). In order to answer this question, some statistical and mathematical tools are used and data mining is one of them.

Contextual Analysis

Contextual Analysis is another essential HR analytics tool, in order to understand its meaning, characteristics and overall context of historical as well as structural setting of a text. Contextual analysis is used with organizations in order to analyse job applications of candidates while recruiting the best person for a specific job role. This system is effective to make the job of the HR professional easier by assessing a job application based on its “fitment for a specific job role”, “stability in career”, “attitude”, “behavior” and many other characteristics (Shrivastava *et al.* 2018).

Benefits of HR Analytics

S. No.	Advantages	Author
1	Reliable Decision Making	Sharma & sharma 2017
2	Predictive Decision Making	Huda & Ardi 2021, Mishra,
3	Return on Investment	Chalutz Ben-Gal, H. (2019)
4	Development of future leader	Momin & Mishra 2015
5	Effective HR Operations	Marler & Boudreau 2017, madhavi laxmi 2016, Latif 2022
6	Need of industry 4.0	Sivathanu & pillai (2018)

Challenges of HR Analytics

S. No.	Disadvantages	Author
1	Missing Procedural elements	Mondore 2011,
2	Lack of Practical Implementation	Angrave 2015, Mohd & Quddus 2015
3	Misalignment between Analytics driven decision and wellbeing of employee	Angrave 2015
4	Lack of analytical skills of HR professional	Anderser 2017
5	Difficult data handling	Levenson and Fink 2017

Reliable Decision Making - HR analytics affect staff's readiness to increase productivity. There are problems with the manual performance evaluation process that have an impact on employees' propensity to do their job better, as well as how HR analytics may offer a viable remedy. The usage of HR analytics is going to be beneficially related to workers' perceptions of reliability and equity but unfavorably related to subjective bias in the performance assessment system. This has

further favorable effects on workers' Performance assessment contentment, which in turn boosts workers' motivation to perform better. Sharma & Sharma (2017)

Predictive Decision making - It is obvious that without predictive analytics expertise from HRM, businesses cannot endure over the long term. Predictive analytics has a larger range of applications, thus it is crucial to implement them in all relevant HRM domains. Companies may lower HR-related expenditures with the use of HRPA, which also improves company performance and boosts employee happiness and participation. Technologies like HRPA, which is developing and improving rapidly, have the ability to provide HR decision-making that is 100 per cent accurate. Mishra et al. (2016)

Return on Investment – Both theoretical and empirical investigations on HR analytics produce larger returns on investment than technological and case-based investigations. The HR activities with the highest return on investment are workforce planning and hiring and choosing employees. Chalutz Ben-Gal (2019) has offered a comprehensive analysis of HR analytics focused on ROI.

Development of future leader- The importance of strategic workforce preparation cannot be overstated. Rapid technological change and strong globalization are prompting organizations to modify their whole business approach. Proactive workforce planning gives an integrated view of the growth of human capital. In the same way HR analytics aid in identifying and developing the leaders of the future. Consequently, a workforce strategy aided by HR analytics will decrease dropping out, reduce threats, and establish an innovative educational environment for the organization. Momin & Mishra (2015)

Effective HR operations – Using information about workers allows for better employees' decision-making. HR analytics assists organizations in aligning HR KPIs with key business objectives. It focuses mostly on obtaining talent in order to evaluate potential HR demands through enhancing staff morale and contentment. HR analytics aids in interpreting information in order to identify patterns and implement remedial steps for the smooth operation of a firm. HR analytics has the greatest impact on company performance, as organizations look for novel business practices to increase effectiveness. Madhavi Lakshmi and Siva Pratap (2016)

HR analytics can be used to build HR strategies, particularly those that focus on staff retention. It is increasingly important to change HRM from a conventional method to a more proactive one as the industry transitions from an industry-based economy to an information-based one. Creating data-driven choices is part of this. HR manager must examine diverse data and evaluate how it relates to business results from a financial perspective in order to comprehend the numerous traits of individuals that can affect business success. Using HR analytics, HRM in this way has benefits, including monitoring employee performance and planning for retaining employees. Latif (2022)

Need of Industry 4.0 - There is a huge significance of Smart HR 4.0 and its function as a stimulant for the upheaval of the HR industry. It was revealed that in order to successfully navigate the obstacles of the advancement of Industry 4.0, a business would need an effective Smart HR 4.0 approach. The majority of HR activities will be automated by developing innovations such as the Internet of Things, Big Data, and machine learning, creating shorter and more effective HR staff. For effective Smart HR 4.0 incorporation that would enable Human resource departments to perform a more proactive contribution to overall company growth, modifications to the organisational context and leadership style would be necessary. Sivathanu & Pillai (2018)

Challenges

Missing Procedural elements – HR analytics has received a lot of attention recently. It allows HR executives to demonstrate the immediate effect of their procedures and efforts on company performance. However, like numerous novel ideas in HR (for instance: participation, quality groups, etc.), the terms and procedural elements related to implementing analytics well have never been adequately communicated. Mondore et al. (2011)

Lack of practical implementation -An important conclusion derived from an analysis of research on the incorporation of HR analytics in the field of HRM is that, whereas there are recommendations for theoretical frameworks that might be embraced for effortless emancipation there is an absence of research that examines the practical relevance of these frameworks and examines the efficacy or failure of such algorithms or techniques when applied in the setting of businesses. Mohammed & Quddus (2019)

Misalignment between Analytics driven decision and wellbeing of employee – Practical implementation as well as conceptual implication need to be understood by HR professional. HRA may affect negatively on the interest of the staff due to misalignment between analytics driven decision making and the wellbeing of the employee, may lead to dissatisfaction and disengagement. Angrave et al. (2015)

Lack of HR analytical skills – Many empirical studies have been done in this regard and this is one challenge which is commonly found in most studies. It is generally accepted that the discipline of HR analytics is still very young and has yet to fully realise all of its potential. According to this perspective, the discipline's strongest supporters are way too sceptical about its immediate and medium-term effects on human resources (HR), but the discipline's protracted prospects are still favourable. The researcher cites maturation, attitude, organisation, and competence as the primary four explanations for why HR analytics remains in its early stages. Andersen (2017)

Difficult Data handling- There is a misperception that increasing the monitoring of HR operations and human resources would inevitably produce findings that can be put to use. The recognition of issues with company efficiency is being neglected in favour of incrementally improving current HR practices. Conventional data mining takes up excessive time, delaying system development and validation, which includes gathering new, more relevant data. Basic handling of information activities takes up too much effort. Levenson & Fink (2017)

4. Some Real life HRA and BI examples-

HR Analytics tools are effective for connecting different systems, visualizing data, assisting in proper reporting, data structuring and customizing. However, these are not effective for actual data analysis (AIHR, 2021). BI tools can only be used for finding data patterns, highlights with current or past trend. However, for advanced predictive analysis HR analytic tools are needed such as R, SPSS and many others. In earlier times, much data of the HR process went unused or it used to be put into charts and tables to interpret the data as a corporate performance pack. However, in the era of big data analytics, organizations are engaging business intelligence solutions within their business structure and using HR analytics tools (Forbes, 2018). For example, PWC uses their BI Solutions for delivering agile, highly interactive reporting, to their clients in order to help them to do their business more effectively (Pwc, 2021). GSK, a leading

pharmaceutical company has a global people data and analytics team sits within the “talent, learning and organisational development centre of excellence”, and this has helped them to improve HR data globally (HRmagazin, 2021). These tools are a fundamental part of business intelligence and through these tools data can be turned into effective information and can help in predicting future events such as employee’s future performance, the time when an employee might be leaving, the sources from that, they can get suitable employees for their specific job roles. Google is an effective example, which have incorporated HR analytics in day-to-day decision making that enhances business operations. Shrivastava, 2018. Google project oxygen is well known. Also For selection process, Google uses some algorithm which has benefitted it in hiring competent staff using HR analytical tool. The well-known American company Xerox has also adopted HR analytics for employee attrition and reduced it by 20%. (Lal et al., 2018)

IBM has launched its digital learning program under learning analytics which is Watson that help employee to assess learning digitally and it also bring learners together who share common interest.(Vachaspati, 2017).

As per an article, a data of HORECA “(Hotel, Restaurant, Café)” industry is collected from a specific retailer, which is a coffee shop and it sell**s “Delicacies” products. These data are imported into a power BI tool for grouping the data set by order-id, and putting them into a customized list column (ARGHIR *et al.* 2019). These are mainly done for conducting association study with some algorithms. This will determine consumers' consumption behaviors from past trends. Some association algorithms are needed to apply across the data set and for this R scripting functionality, an HR analytic tools has been used within Power BI Desktop. In this process, HR analytic tools are combined with BI tools for data association within a business.

5. Conclusion

Business Intelligence and analytics has emerged as a major area of concern for several researchers as well as practitioners in order to solve data related issues within a business organization. As a result, it has been found from the research paper that HR analytics tools for improving the existing “HRM system” is an essential factor within a business. As per the findings, HR analytics is considered as one of the major decision-making factors within a business organization, as they can

help the HR professional and business managers to make decisions with a predictive model. As per the findings, it has been observed that high performance companies like Google than any other low performance companies mainly use HR analytics. Most of the top performing organizations use HR analytics 5 times more than low performing organizations. HR analytics helps to improve market competitiveness by choosing the right tool, right purpose and collaborative interventions. (Bose and Jose, 2017).

As per the study, use of HR analytics within business organizations is effective to understand the impact of HR practices and policies on organizational performance. HR analytics is considered as a potential way for HR functions. HR professional needs to develop their ability and skill with the help, of HR metrics and analytics to play a strategic role. (Lawler et al. 2004)

As per the findings, data analytics helps HR professionals to identify specific parameters that can aid both HR management and HR development process within an organization. Predictive analysis is effective to ensure that Raw data within an organization can be analyzed to draw useful interfaces, with the help of IT infrastructure. (Mohammed and Quddus, 2019)

However, lack of analytical thinking of HR professionals is one of the major challenges. As HR analytics make the operation efficiency of HR professionals easier, it enhances the organizational performance as a whole. Moreover, this paper has focused on both challenges and benefits of these tools within business simultaneously.

Future research can be done on the working on specific Human Resource Analytical tools that how they actually work in an organization setting. And also a conceptual framework can be developed that how HR analytics can bring Organization performance in future research.

References

- Ahamad, F. (2020). Sustainable human resource management practices to attract and retain talents: A new approach to human resource management system. *LBS Journal of Management & Research*, 18(1), 42-51.
- AIHR (2022). *Big data, business intelligence, and HR analytics: How are they related?*. Retrieved on 28 March 2022 from <https://www.aihr.com/blog/big-data-business-intelligence-hr-analytics-related/>

International Journal of Mechanical Engineering

- Andersen, M. K. (2017). Human capital analytics: the winding road. *Journal of Organizational Effectiveness: People and Performance*, 4(2), 133-136.
- Angrave, D., Charlwood, A., Kirkpatrick, I., Lawrence, M., & Stuart, M. (2016). HR and analytics: Why HR is set to fail the big data challenge. *Human resource management journal*, 26(1), 1-11.
- ARGHIR, D.C., Ioana-Gilia, D.U.Ş.A. & Onuţă, M. (2019). Organizational development through business intelligence and data mining. *Database Systems Journal BOARD*, 82.
<http://dbjournal.ro/archive/30/30.pdf#page=82>
- Bose, I. & Jose, D., (2017). Evolution of human resource analytics: An exploratory study. *AIMA Journal of Management & Research*, 12(1/4), 1-6.
- Chalutz Ben-Gal, H. (2019). An ROI-based review of HR analytics: practical implementation tools. *Personnel Review*, 48(6), 1429-1448.
- Chen, H., H.L.Chiang, R., & C. Storey, V. (2018). Business Intelligence and Analytics: From Big Data To Big Impact. *MIS Quarterly*, 36(4), 1165–1188. <http://www.jstor.org/stable/41703503>
- Chen, H., Chiang, R.H. and Storey, V.C. (2012). Business intelligence and analytics: From big data to big impact. *MIS quarterly*, 1165-1188.
https://is.wcu.edu/wchung/rsch/cbia/doc/BIA_Rsch_MISQ12.pdf
- Forbes (2022). *why-data-is-hrs-most-important-asset*. Retrieved on 17 March 2022 from <https://www.forbes.com/sites/bernardmarr/2018/04/13/why-data-is-hrs-most-important-asset/>
- Garcia-Arroyo, J. & Osca, A. (2021). Big data contributions to human resource management: a systematic review. *The International Journal of Human Resource Management*, 32(20), 4337-4362.
https://www.researchgate.net/profile/Amparo-Segovia-2/publication/336363935_Big_data_contributions_to_human_resource_management_a_systematic_review/links/5f967539458515b7cf9eed44/Big-data-contributions-to-human-resource-management-a-systematic-review.pdf
- Ghosh, A. & Sengupta, T. (2017). J. Fitz-Enz and II John Mattox, Predictive analytics for human resources. *Human Resource Development International*, 20 (2), 180-183.
<https://doi.org/10.1080/13678868.2016.1258914>
- Giermindl, L.M., Strich, F., Christ, O., Leicht-Deobald, U. & Redzepi, A. (2021). The dark sides of people analytics: reviewing the perils for organisations and employees. *European Journal of Information Systems*, 1-26. <https://www.tandfonline.com/doi/pdf/10.1080/0960085X.2021.1927213>

International Journal of Mechanical Engineering

- HRmagazine (2021). *Setting-up-a-people-analytics-function-at-gsk*. Retrieved on 28 March 2022 from <https://www.hrmagazine.co.uk/content/features/setting-up-a-people-analytics-function-at-gsk>
- Huda, A., & Ardi, N. (2021). Predictive Analytic on Human Resource Department Data Based on Uncertain Numeric Features Classification. *Int. J. Interact. Mob. Technol.*, 15(8), 172-181
- Lal, E. A., Mary, S., Chauhan, K., Jones, C., Powell, J. L., & Khan, N. A. (2018). *Journal of Social Welfare and Management International Editorial Advisory Board* (Vol. 10, Issue 2).
- Latif, N. A. (2022). Designing Strategies for Reducing Employee Turnover: Human Resource Analytics Application. *International Journal of Advanced Research in Technology and Innovation*, 4(3), 31-35.
- Lawler III, E.E., Levenson, A. & Boudreau, J.W. (2004). HR metrics and analytics—uses and impacts. *Human Resource Planning Journal*, 27(4), 27-35. https://ceo.usc.edu/wp-content/uploads/2004/05/2004_08-g04_8-HR_Metrics_and-Analytics.pdf
- Levenson, A., & Fink, A. (2017). Human capital analytics: too much data and analysis, not enough models and business insights. *Journal of Organizational Effectiveness: People and Performance*, 4(2), 145-156.
- Madhavi Lakshmi, P., & Siva Pratap, P. (2016). HR analytics-a strategic approach to HR effectiveness. *International Journal of Human Resource Management and Research (IJHRMR) ISSN (P)*, 2249-6874.
- Marler, J. H., & Boudreau, J. W. (2017). An evidence-based review of HR Analytics. *The International Journal of Human Resource Management*, 28(1), 3-26.
- Mishra, S. N., Lama, D. R., & Pal, Y. (2016). Human Resource Predictive Analytics (HRPA) for HR management in organizations. *International Journal of Scientific & Technology Research*, 5(5), 33-35.
- Mohammed, D. & Quddus, A. (2019). HR analytics: A modern tool in HR for predictive decision making. *Journal of Management*, 6(3). PWC (2022). *business-intelligence*. Retrieved on 28 March 2022 from <https://www.pwc.co.uk/issues/data-analytics/services/business-intelligence.html>
- Momin, W. Y. M., & Mishra, K. (2015). HR analytics as a strategic workforce planning. *International Journal of Applied Research*, 1(4), 258-260.
- Mondore, S., Douthitt, S., & Carson, M. (2011). Maximizing the impact and effectiveness of HR analytics to drive business outcomes. *People and Strategy*, 34(2), 20.

International Journal of Mechanical Engineering

- Saxena, M., Bagga, T., & Gupta, S. (2021). Fearless path for human resource personnel's through analytics: a study of recent tools and techniques of human resource analytics and its implication. *International Journal of Information Technology (Singapore)*, 13(4), 1649–1657.
<https://doi.org/10.1007/s41870-021-00677-z>
- Shamim, S., Zeng, J., Shariq, S.M. & Khan, Z. (2019). Role of big data management in enhancing big data decision-making capability and quality among Chinese firms: A dynamic capabilities view. *Information & Management*, 56(6), 103135.
- Sharma, A., & Sharma, T. (2017). HR analytics and performance appraisal system: A conceptual framework for employee performance improvement. *Management Research Review*, 40(6), 684-697
- Shrivastava, S., Nagdev, K. & Rajesh, A. (2018). Redefining HR using people analytics: the case of Google. *Human Resource Management International Digest*, 26(2), 3-6.
https://www.researchgate.net/profile/Shweta-Shrivastava-2/publication/323936892_Redefining_HR_using_people_analytics_the_case_of_Google/links/5d304857a6fdcc2462e8e8f1/Redefining-HR-using-people-analytics-the-case-of-Google.pdf
- Sivathanu, B., & Pillai, R. (2018). Smart HR 4.0—how industry 4.0 is disrupting HR. *Human Resource Management International Digest*, 26(4), 7-11.
- Statista (2022). *Size of the business intelligence and analytics software application market worldwide, from 2019 to 2025*. Retrieved on 17 March 2022 from
<https://www.statista.com/statistics/590054/worldwide-business-analytics-software-vendor-market/>
- Vachaspati, S. (2017). *HR Analytics in IBM : Employee Engagement Index and the Digital Learning Marketplace HR Analytics in IBM : Employee Engagement*. July, 44–53.
<https://doi.org/10.1177/0974173920170310>