HR ANALYTICS: INSIGHTS FROM LITERATURE

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ABSTRACT

HR analytics is being adopted by organizations and its importance has steadily increased to become more of a necessity. Since it is an emerging topic, this paper aims to present an overview of HR analytics' content, scope, significance, opportunities and challenges in its applications. The methodology adopted was review of literature from 144 articles including 62 peer-reviewed ones selected from online search of three large databases with the terms 'human resource/ workforce/ people/ talent analytics', 'human capital analytics and metrics' and 'predictive human resource analytics'.

The study finds that HR analytics, as a concept, is still a developing one with further strengthening required on its several aspects. Analytics cannot replace HR but can definitely assist HR professionals in discharging their roles in an improved manner. The primary objective of HR analytics is to increase organizational effectiveness by way of better data-based managerial decisions. However, evidence about usage of HR analytics is limited. A universally acceptable definition for it is a potential area for research. The factors responsible for its adoption in general as well as in different research settings also need to be studied.

Keywords: HR analytics, workforce, human capital trends, evidence based decisions, descriptive, predictive, prescriptive, organizational effectiveness.

INTRODUCTION

The convergence of ever increasing computational abilities, newer technologies and availability of Big Data is shrinking the world. The four trends of information viz. speed, pervasiveness, internet of things, and integrated patterns are transforming organizations and creating competitive advantage (Brockbank, Ulrich, Kryscynski, & Ulrich, 2018). Analytics is helping organizations to manage the volatility, uncertainty, complexity and ambiguity (VUCA) of the real business world. Unlike metrics/ statistics, it connects multiple data

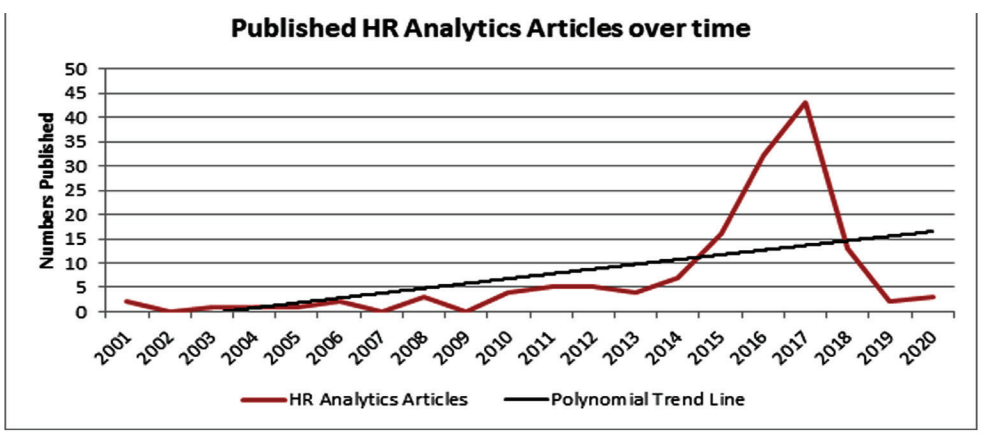
sources in one holistic view to provide insights, trends and patterns so that the right strategy can be executed for the future (Poon, 2016). The human resource (HR) discipline too is striving hard to reduce its dependency on intuitiveness or prior knowledge of human capital, the most important and valuable asset of any organization. Combination of several HR metrics, earlier used in isolation, into comprehensible information and its synthesis into analytics gives rise to predictive behavior based on which important decisions could be taken at the employee/ organization level. As more organizations adopt, its ability to create differentiation, using it to solve business problems, improve retention/ hiring of workforce and make more evidence-based decisions is getting revealed (SHRM, 2016).

Based on available literature, the paper attempts to critically examine various aspects of the buzzword HR Analytics through the contributions of different scholars in this field. The ultimate aim of the paper is to enable researchers and practicing HR professionals to visualize where HR analytics stands today and develop a holistic view about this new concept which aids HR in measuring its own performance/ contribution to business, managing the total cost of workforce and being equal partners (along with other disciplines) in the digital organization of the future.

RESEARCH METHODOLOGY

A detailed search was carried out on three large sources (ProQuest, Google Scholar and Scopus) to gather academic literature on HR analytics published between 2001 and 2020. The keywords used were 'human resource/ workforce/ people/ talent analytics', 'human capital analytics and metrics' and 'predictive human resource analytics'. The search returned 348 numbers of articles which included peer-reviewed ones as well as others like dissertations, books/ book chapters, conference papers etc. Meta-data of these articles were scanned, read and finally only those publications which focused on HR analytics were selected i.e. 144 numbers.

The number of articles published over the years is summarized in Figure–1; 75% of them having been published between 2015 and 2020 indicate the increasing research interest in HR analytics during the recent years.



Figure–1: Articles on HR Analytics published over time.

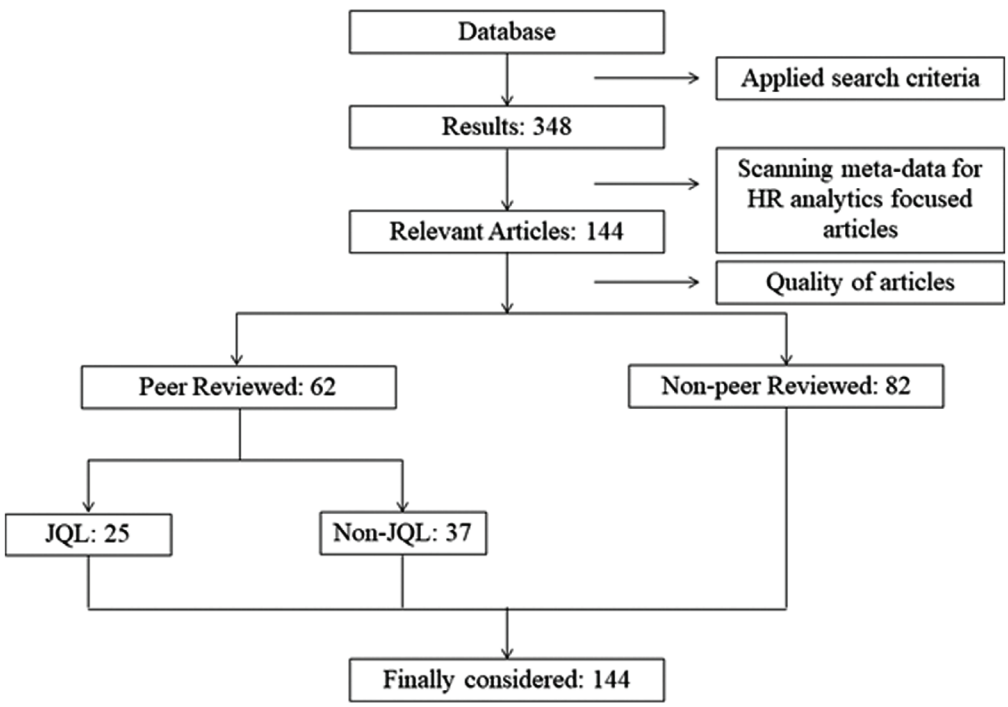
The selected articles were then categorized into peer-reviewed (62 numbers) and non-peer reviewed (82 numbers). These were further classified into whether the journals appeared on the Journal Quality List (JQL) 67th Edition; the result is depicted in Table–1.

Table 1: Peer-reviewed publications on HR Analytics

Journal	Numbers	JQL *
Academy of Management Proceedings	1	N
Accounting, Auditing & Accountability Journal	1	N
Business Horizons	2	Y
California Management Review	1	Y
Consulting Psychology Journal: Practice and Research	1	N
Employment Relations Today	1	N
European Journal of Operational Research	1	Y
Human Resource Management	9	Y
Human Resource Management International Digest	2	N
Human Resource Management Journal	1	Y
Human Resource Management Review	1	Y
Human Resource Planning	2	Y
Industrial and Organizational Psychology	1	N
Journal of Business Strategy	1	Y
Journal of Computer Information Systems	1	Y
Journal of Enterprise Information Management	1	Y
Journal of Leadership Studies	1	N
Journal of Management Studies	1	Y
Journal of Organizational Effectiveness: People and Performance	6	N
Journal of Teaching in Travel & Tourism	1	N
Journal of Work-Applied Management	1	N
Management Science	1	Y
McKinsey Quarterly	1	N
MIT Sloan Management Review	1	Y
Organizational Dynamics	1	Y
People & Strategy	5	N
Performance Improvement	1	N

Performance Improvement Quarterly	1	N
Research-Technology Management	1	Y
Social Sciences	1	N
South Asian Journal of Human Resources Management	1	N
Strategic Direction	1	N
Strategic HR Review	7	N
Technology Innovation Management Review	1	N
The International Journal of Human Resource Management	2	N
Total	**62**	**Yes: 25**

First, detailed literature review was carried out with the 25 JQL publications only which gave some scholarly insights into HR analytics. However, several aspects were still uncovered and, therefore, the scope was enlarged to include the balance 37 peer-reviewed articles. While newer facets of the field did emerge with this inclusion, yet it was difficult to present a complete review and, hence, the remaining 82 non-peer reviewed publications were also considered (Figure–2).



Figure–2: Article Selection Process

DISCUSSION OF FINDINGS

After reviewing the 144 literature publications, few major research categories were identified which portray a complete picture about HR analytics and are discussed below.

Interest in HR Analytics and its Potential

A Google search on HR/ Workforce/ People Analytics throws up results of the order of millions. Several actors on the supply side viz. consulting/ technology firms, professional organizations, management gurus, and social media (Rasmussen & Ulrich, 2015; Madsen & Slåtten, 2017; Tursunbayeva, 2020) are contributing their bit to popularize HR analytics. It is being shown to increase the quality of new hires, enhance skills and capabilities, clarify and specify goals, enhance employee engagement, and connect appropriate rewards to employee performance (Boudreau & Cascio, 2017). On the demand side, global organizations have benefited extensively through its use. For example, Google restructured its recruitment processes, Xerox improved its attrition rate, Royal Dutch Shell identified employees who could give best ideas and IBM developed an understanding of a successful sales person. For Tech Mahindra, the data-driven analytics helped the company stay focused on its mandate of creating diversity, meaning, and value (Verma, Bansal, & Verma, 2020).

Analysis of Deloitte's Global Human Capital Trends during 2014 to 2020 reveals several aspects about this field (Table–2). First, the gap between the perceived importance and reported readiness of organizations represents the opportunity/ potential for its implementation. Secondly, its steadily increasing importance across the world with more than 70% respondents perceiving it to be very important/ important every year highlights the interest in the field with nearly all industries echoing the rising need of analytics in HR.

Table 2: Analysis of Global Human Capital Trends, 2014 to 2020

	2014	2015	2016	2017	2018	2019	2020
Importance & Readiness for HR analytics as perceived by Organizations						(analytics as a part of HR technology or cloud)	(analytics as a part of measuring workforce strategies)
Perceived Urgency/ Importance	71	66	77	71	85	74	71
Reported Readiness	11	35	32	32	42	41	33
Importance across the World							
North America	47	66	78	75	85	77	64.4
Latin & South America	24 (S. America)	70	77	75	88.2	78	78.7
Africa	21	72	80	75	89.3	82	75.6
Central & Eastern Europe	23	60	78	69	81.4	71	73.2

Middle East	15	67	76	69	86.4	85	72.7
Nordic Countries	NA	65	76	68	84.7	68	56.9
Western Europe	41	60	72	61	77.2	68	65.8
Southeast Asia	NA	71	85	NA	NA	NA	NA
Asia	NA	64	81	81	90.1	75	82.8
Oceania	NA	66	83	71	85.6	77	73.1
Global	72	66	77	71	84.8	74	71.3
Importance across various Industries							
Consumer business	70	66	79	72	85.8	76	72.1
Energy & resources	71	66	77	69	83.9	74	73.8
Financial services	71	69	80	71	89.2	79	69.7
Life Sciences & Health care	80	65	80	75	85.0	70	73.0
Manufacturing	66	64	76	68	81.2	NA	NA
Professional Services	73	67	74	72	84.0	73	70.4
Public Sector	71	64	73	67	78.6	NA	NA
Technology, media & telecommunications	78	67	78	74	89.8	76	73.6
Global	72	66	77	71	84.8	74	71.3

Note: Figures represent percentage of respondents
Source: Deloitte's Global Human Capital Trends, 2014 to 2020

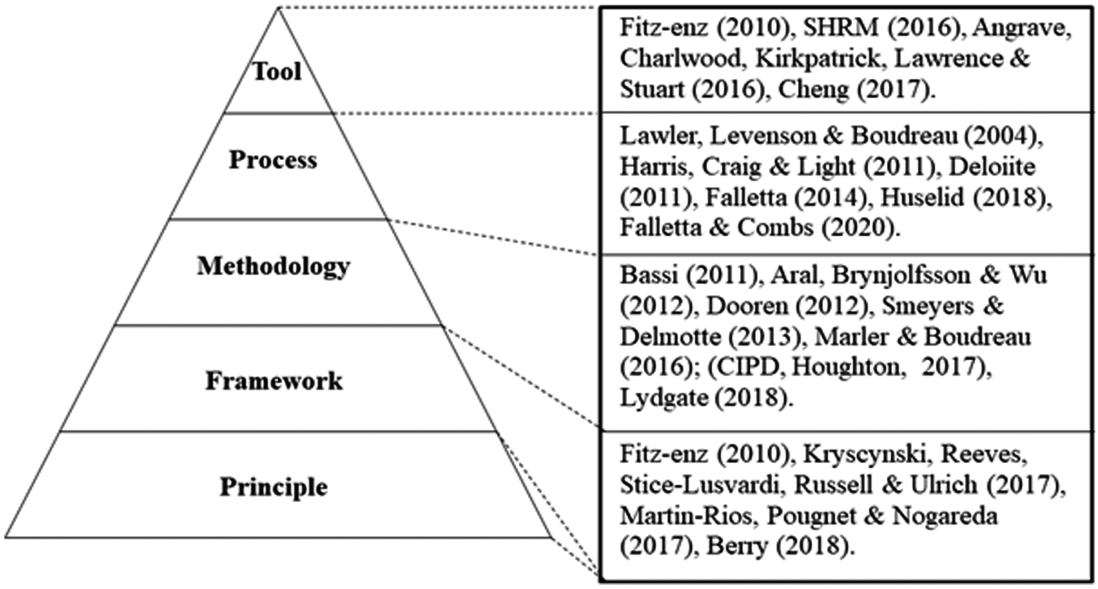
Concept of HR Analytics

Academic literature portrays a varying picture of HR analytics on the maturity continuum. According to some, it is still a fledgling activity, a fairly immature field, which has not yet reached its full potential (Andersen, Human capital analytics: the winding road, 2017a). It is considered as a new HR tool, with many companies ramping up investments in HR analytics, but yet to come out with significant success stories (Baesens, Winne, & Sels, 2017; Ergle, Ludviga, & Kalviņa, 2017). It has been opined (Heuvel & Bondarouk, 2017) that most organizations who do adopt it are still struggling as it is difficult to have the right competences and available resources and are, therefore, highly dependent on success stories of organizations which have already implemented HR analytics (Fitz-enz, The New HR Analytics, 2010; Fitz-enz & Mattox, Predictive Analytics for Human Resources, 2014; Pease, Beresford,

& Walker, 2014; Ergle, Ludviga, & Kalviņa, 2017). As a result, HR analytics has to be specifically tailored to the organization (Lawler, Levenson, & Boudreau, 2004; Heuvel & Bondarouk, 2017).

Figure–3 captures the different perspectives of HR analytics as defined in literature. While none of the researchers have categorized it as a 'principle', a number of them classify it as a framework, methodology, tool or a process.

Figure–3: HR Analytics: Different perspectives



Source: Authors' own compilation

It, therefore, emerges that there is no standard definition (Marler & Boudreau, 2016) so far, several disparities are observed in the various definitions (Lydgate, 2018) and maybe managers working in this field still do not have a clear definition of this concept (Minbaeva, 2017). Whether HR analytics is a fad (Rasmussen & Ulrich, 2015) or a hype now but definitely a game changer for the future of HR (Togt & Rasmussen, 2017).

Levels of HR Analytics

HR analytics has been categorized into several levels (Fitz-enz, The New HR Analytics, 2010; Fitz-enz & Mattox, Predictive Analytics for Human Resources, 2014; Wegman, 2016), All categorizations fall into three main categories viz. descriptive, predictive and prescriptive. Few have introduced another category of diagnostic analytics in between the descriptive and predictive stages and have tried to popularize the process in terms of hindsight, insight and foresight (Holme & Bhawalkar, 2016; Coy, 2017).

With the advent of Artificial Intelligence, it is predicted that the next category of HR analytics would be predictive analytics coupled with Cognitive Intelligence creating way for another

term coined as Cognitive HR. This new phase would combine machine learning and natural languages processing (Mondal, 2016; Teljo, 2016; Holme & Bhawalkar, 2016). As the field is still a developing one, newer levels cannot be ruled out in the near future.

Skills for HR Analytics

The increasing use of analytics in all fields including HR has led to a multi-fold requirement of specialists with big data skills (Martin-Rios, Pougnet, & Nogareda, 2017). These specialists need to have expertise in business, HR, research design, knowledge in statistics analysis, new programming languages, data warehousing technologies, and visualization/ data communication methods (PwC, 2015; Kaur & Fink, 2017). This is because the requirement for any organization is to have the appropriate data, know how to use it and understand how to explain it, visualize it, and put it in front of a business leader (Bersin, 2017; Kaur & Fink, 2017).

For HR professionals to be able to translate the right information into valuable insight (Ulrich & Dulebohn, 2015), four individual capabilities are termed critical (Becker, Huselid, & Ulrich, 2001; Kryscynski, Reeves, Stice-Lusvardi, Ulrich, & Russell, 2017):

1. Critical causal thinking to establish causal connections between elements in the system.
2. Understanding the principles of good measurement to perform analysis.
3. Estimating causal relationships from appropriate data and information.
4. Translate results into understandable and actionable insights.

Applications and Practices in HR Analytics

HR analytics helps connect an individual process such as On-boarding, Selection, Performance Management, Employee Opinion Surveys, Competencies, Leadership Development, etc. to important business outcomes (Mondore, Douthitt, & Carson, 2011). Broadly, workforce analytics efforts are of three types: HR administrative process efficiency, operational effectiveness/ organizational process improvement and strategic realignment (Carlson & Kavanagh, 2018). While certain applications like talent analytics and recruitment have diffused in organizations much faster with favourable results, there are many others which are gradually picking up, viz. Workforce planning/ remuneration and benefits, Performance management, Learning and development, Employee relations, Improvement in business performance, Spotting process deficiencies, Policy Optimization, Determining organization design etc. (Falletta S. V., 2014; Lal, 2015; Eigen & Christlieb, 2016; Watson, 2018; Campbell & Vuong, 2017; Kaur & Fink, 2017; Nocker & Sena, 2019; Ayanso, 2016).

While there is no one-size-fits-all solution for building an analytics function (Kaur & Fink, 2017), Deloitte's high-impact people analytics research revealed that data accuracy, security and consistency were essential ingredients of analytics maturity and that presence of a data council in organizations was a critical success factor for data reliability and usefulness (Bersin, 2017). Also, HR professionals may be trained to acquire analytical capabilities (Rasmussen & Ulrich, 2015) and, before building an analytics team, an operating model best suited to the organization needs to be formulated e.g. the hub-and-spoke model (Tsagaroulis, 2017).

Significance of adopting HR Analytics

It is important to understand that businesses do not create value, people do; therefore, a growing company demands elevated levels of productivity, hugely engaged teams and a culture that encourages innovation (Chopra, 2017). Besides, the complex VUCA environment puts tremendous pressure on them to reduce their costs (Amladi, 2017) plus the digital transformation that is set to alter the workplace (Rimon, 2017; Larkin, 2017). Industry 4.0 puts higher demand for skilled workforce (Morrar, Arman, & Mousa, 2017) and talent is becoming diverse by changing technology/ skills requirements and increase in non-traditional jobs (Mitnick, 2017).

The key advantage with HR analytics is the ability to proactively analyze, predict and reshape future skills, knowledge and abilities as the organization and marketplace changes (Maguire, 2016). Today, workers expect employers to understand their needs and engage with them in a personalized manner (Jesuthasan, 2017) especially when the global workforce is dominated by millennials who aspire to work with partners rather than bosses (Rao, 2017). With the right knowledge, tools and analytics, HR can design lifelong learning and development activities based on workers' fluctuating needs (Khoury, 2017). Analytics also helps HR in workforce differentiation whose basic premise is that strategic homogeneity destroys value (Wang & Cotton, 2017).

Problems and Challenges in HR Analytics

There seems to be a unanimous view that HR analytics has not advanced to the extent it deserves (Boudreau & Cascio, 2017) and is, therefore, behind where it should have been (Andersen, Human capital analytics: the winding road, 2017a).

The biggest challenge is how the top management can be persuaded to believe that HR analytics offers a positive return on investment (Minbaeva, 2017). Bridging the gap between so much data and the employees (Leonard & Nelson, 2016), information overload and driving results from data and analytics (Welbourne, 2015) pose many challenges. Ethics violations, data privacy and compliance to various norms like the new General Data Protection Regulation (Guenole, Feinzig, & Green, 2018; Eigen & Christlieb, 2016) are some of the bigger risks associated.

Unavailability of clean data from legacy HR systems (Kaur & Fink, 2017), poor IT systems and problems of data integration and integrity (Bersin, 2017) are the major reasons for not being able to achieve the desired objectives. The absence of an agreed definition of HR (Houghton, 2017), lack of relevance to business (Vulpen, 2016), companies spending too much time mining existing data (Levenson & Fink, 2017; Huselid, 2018) are also some of the other reasons.

Factors relevant for adoption of HR Analytics

In a study by Cornell University (CAHRS, 2010) on how partner companies were using HR analytics, centralized data, field training of HR users, support from senior leaders and enhanced technology emerged as the key enablers. On the other hand, the barriers were lack of skills of front-line HR generalists, organization culture, lack of incentives to share data across functions, lack of sophistication among potential data users and data credibility.

The HR Outlook Survey 2016-17 by CIPD (2017) reports data & technology, organization culture, workforce capability, leadership drive, internal relationship, organization strategy and

external environment to be the main barriers to adoption of HR analytics among professionals. Besides, the output generated by the analytics' system could also act as a potential barrier (Lunsford, 2019).

Two studies conducted in detail using theories of technology adoption enlist the influencing factors/ barriers for adoption of HR analytics. The constructs used were general/ technology self-efficacy, quantitative self-efficacy, effort expectancy, performance expectancy, attitude towards HR analytics, data availability, fear appeals, social influence/ norms and tool availability/ trialability. Nearly all of them were found to be significant for adoption either positively or negatively (Vargas, Adoption Factors Impacying Human Resource Analytics Among Human Resource Professionals, 2015; Vargas, Yurova, Ruppel, Tworoger, & Greenwood, 2018).

CONCLUSION AND RESEARCH IMPLICATIONS

Starting from simple metrics, HR analytics has indeed come a long way. It is a journey and not a destination (Carlson & Kavanagh, 2018). Traditional approaches of HR are no longer sufficient to survive in the VUCA world. The vast amount of data being generated today was there earlier also but now with the advent of various technologies it has become possible to collect, process, analyze and use it for competitive advantage. The ultimate aim of all these efforts is to predict, that too with accuracy, and help in controlling the uncertainties on account of an organization's own people.

HR analytics is like a double-edged sword. While predicting human behavior truly helps the world yet it brings great responsibility in terms of ensuring privacy, avoiding intrusion and ethics. It is an opportunity for HR to shed its past, transform itself, increase its value and use numbers to contribute to organizational decision-making. At the same time, it should not overshadow the human aspects. Analytics cannot replace HR but it can definitely assist HR professionals in discharging their responsibilities in an improved manner.

The concept is characterized as an evolutionary rather than revolutionary capability with a rich history and promising future (Falletta & Combs, 2020). The future of HR analytics entails collection of data from being direct/ active to indirect/ passive with surveys expected to be replaced by continuous background observations. By using artificial intelligence/ machine learning, the process of generating insights is being automated. It is also foreseen that by 2025, HR analytics would be an established discipline with proven impact on business outcomes and having a strong influence in operational and strategic decision-making.

The opportunities galore open up several research implications. Evidence about usage of HR analytics is limited. A higher-quality survey work could provide an accurate measure of what metrics are being used, to what extent and for what purpose. Besides, the definition of HR analytics which could be universally accepted is another potential area for research. Since the field is still a developing one, information about the factors responsible for its adoption is hardly available. Such studies in several research settings is yet to take place viz. specific sectors, extension of technology adoption theories, models to decipher newer factors etc.

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