

HUMAN RESOURCE ANALYTICS IN INFORMATION TECHNOLOGY INDUSTRY: AN EXPLORATORY STUDY IN HYDERABAD

A Thesis

Submitted in partial fulfillment of the requirements for the
award of the degree of

**DOCTOR OF PHILOSOPHY
IN
MANAGEMENT**

By

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Under the Supervision of
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DECLARATION

I, hereby declared that the presented work in the thesis entitled “**HUMAN RESOURCE ANALYTICS IN INFORMATION TECHNOLOGY INDUSTRY: AN EXPLORATORY STUDY IN HYDERABAD**” in fulfilment of degree of **Doctor of Philosophy (Ph.D.)** is outcome of research work carried out by me under the supervision Dr. Mridula Mishra working as Professor & Head of Department in the Mittal School of Business of Lovely Professional University, Punjab, India. In keeping with general practice of reporting scientific observations, due acknowledgements have been made whenever work described here has been based on findings of other investigator. This work has not been submitted in part or full to any other University or Institute for the award of any degree.

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CERTIFICATE

This is to certify that the work reported in the Ph.D. thesis entitled “**HUMAN RESOURCE ANALYTICS IN INFORMATION TECHNOLOGY INDUSTRY: AN EXPLORATORY STUDY IN HYDERABAD**” submitted in fulfillment of the requirement for the reward of degree of **Doctor of Philosophy (Ph.D.)** in the Lovely Faculty of Business and Arts, is a research work carried out by Paleti Narendar ,Registration No.41900585, is bonafide record of his original work carried out under my supervision and that no part of thesis has been submitted for any other degree, diploma or equivalent course.



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LIST OF ABBREVIATIONS

AI/ML	Artificial Intelligence/ Machine Learning
ATS	Applicant Tracking System
B2E	Business To Employee
BIEBHR	Business Information Evidence Based Human Resource
CAGR	Compound Annual Growth Rate
CMM	Capability Maturity Model
EBHR	Evidence Based Human Resource
E-HRM	Electronic Human Resource Management
ERP	Enterprise Resource Planning
FAQ	Frequently Asked Questions
FWA	Flexible Work Arrangements
HRA	Human Resource Analytics
HRIS	Human Resource Information System
HRMS	Human Resource Management System
IDSS	Intelligent Decision Support System
IoT	Internet of Things
IT	Information Technology
KD	Knowledge Discovery
KPI	Key Performance Indicators
NASSCOM	National Association of Software and Services Companies

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ABSTRACT

Background: The companies are moving from intuition based practices to evidenced based practices as human capital is considered as the core for every organization. The companies found a new technology HR Analytics helps in many ways by contributing to management in taking strategic decisions, employees by understanding them and getting their work recognized, and to HR department by providing various metrics that helps in improving their working style, fulfilling the compliance requirements and targets in filling the employment vacancies, reducing attrition, involving them in taking decisions thus making them strategic partners in the organization. Hence there is a need to look into HR analytics with a wider perspective.

Research Gap: On the basis of this review the following research gaps are identified. Firstly, the present studies are conducted on exploratory basis as HR Analytics is in infancy stage. Most of the present studies are based on foreign countries or developed. As India is a developing country requires to study about the adoption of HR Analytics.

Secondly, from the available research , it is understood that HR analytics is composed to march forward from statistical reporting to evidence-based predictive decision-making. consequently, it is requisite to move ahead into more of evidence-based HR practices and to understand the necessity for such practices.

Thirdly, it was also analyzed that the future of HR analytics could exist as a separate function as it increases the performance of the organization; however, only little studies have been done on how it increases the organizational performance. This throws a sizeable challenge which needs to be addressed by future research.

Finally, in spite of the fact that HRA shall have results with evidences, the studies on HR Analytics are very less in academic research and also in IT industry. We provide potential suggestions on how to implement HR Analytics overcoming the challenges and barriers and advocate directions for future research.

Objectives of the Study

The objectives of this study are to provide answers to the following questions:

1. To assess the existing HR practices in IT Industry and reasons for using HR Analytics in IT Industry
2. To measure the influence of Human Resource Analytics and the organizational performance in IT industry
3. To explore the factors for the successful implementation of HR Analytics in IT Industry
4. To investigate the challenges and barriers encountered in using HR analytics in the IT industry
5. To prepare the recommendation and give suggestions to IT industry

Hypothesis – Objective Wise

Objective 1 : To assess the existing HR practices and reasons for using HR Analytics in IT Industry

For better insights, the objective is divided into two sections

To assess the existing HR practices

Hypothesis

Null $H_{01}: \mu \leq 2.5$

$H_{01} = 0$

There is no relationship between identified and existing HR Practices in IT Industry

To assess the reasons for using HR Analytics in IT Industry

Null Hypothesis

- $H_{02} = 0$:There is no significant relationship between HR Practices in IT Industry and AI for Sourcing The Job Applicant, Chat Bots, AI in Tracking The Employee Background , right Decision Making , Revision Of Training Structure & Material , identifying the Attrition Reasons , Work Culture , Employee Participation , Reduced Biasness .

Objective II : To measure the influence of Human Resource Analytics and organizational performance in IT industry

Null $H_{03}: r=0$

[There is no significant association between HR Analytics and Organizational Performance i.e Reduced Costs, Employee Performance, Employee Retention, Effective and efficient budget planning and Employee Engagement

Objective III: To explore the factors for the successful implementation of HR Analytics in IT Industry

Null Hypothesis

$H_{04} = 0$:There is no significant relationship between HR Analytics implementation and Dashboard, Reward Systems, Easiness In Technology & Customized Software, Job Opportunities, Analytical Culture, Management Support, Quality Data, Enhanced Decision Skills, Opportunity to Use, Reduced Costs Support Function To Core Function

Objective IV: To investigate the challenges and barriers encountered in using HR analytics in the IT industry

Null Hypothesis

- $H_{05} = 0$:There is no significant relationship between HR Analytics in IT Industry and Challenges and Barriers in using i.e Financial Aspect,Employee Resisitance,Quality Data,Analytical Skills, Trained & Expertise

Methodology: As HR Analytics is in infancy stage and most of the existing researches is carried on exploratory methodology. The researcher has used mixed methodology, firstly qualitative methodology by way of open ended structured questionnaire is used to collect the data from participants. A total of 16 interviews were done and the transcripts were validated by means of respondent validation. Then the transcripts were analyzed by using NVIVO 11 software to obtain the themes. A total of 36 themes were obtained and used in the preparation of questionnaire using 5 point likert scale using 'i.e ' Not at all-1 to 'To a Very Great Extent -5' (Intan Osman, 2011) after the validity , and reliability tests , finally after adding, deleting, modifying ,35 themes were obtained which were backed up by literature and used in the preparation of final quantitative questionnaire. The quantitative methodology i.e descriptive statistics, correlation analysis, multiple regression is used for analyzing the responses of 400 sample from the Middle and Upper level HR employees from CMM LEVEL 5 IT companies in Hyderabad region that have implemented HR Analytics

Results: The results show that Artificial Intelligence is not used in all the functions of HR department, making HR Analytics restricted to descriptive and predictive analytics. HR Analytics helps in improving the organizational performance. The significant factors for implementation of HR Analytics are found to be migration of HR from Support Function to Core Function, Job Opportunities, Management Support, Quality Data, Enhanced Decision Skills Opportunity to Use, Dashboard Availability, Reward Systems and factors like Easiness In Technology & Customized Software, Analytical Culture, Reduced Costs are insignificantly effecting the HR Analytics implementation in IT Industry. The study also found the challenges and barriers in using HR Analytics i.e Trained & Expertise and Employee Resistance, Analytical Quality Data are found to be the challenges and barriers in using HR

Analytics, however, the financial cost is not the challenge and barrier in IT industry. The insignificant factors of the study are also supported by literature.

Conclusions: The companies need to concentrate on extending the HR analytics to all the functional areas of HR and there is need to integrate technologies like Artificial Intelligence with HR analytics as Artificial Intelligence helps in moving to prescriptive analytics. The companies need to concentrate on training to first level employees by highlighting the importance of data they input in the HRIS. The HR managers have to explain with evidences the importance of HR Analytics and how it can bring positive change if it is extended to other departments.

CHAPTER I

INTRODUCTION

1.1 Background

HR analytics assumes more significance being an essential one for the development of the organization as it is emerging as a new area. It enables to resolve the problems with the available information pertaining to the employees and thus helps to move forward. It helps to collect the relevant data of the employees with use of combination of methodology applied with statistical models and software, thus helping HR people to take decisions. Edwards (2022) points out that HR Analytics is emerging not only in industry but also as an academic interest and requires to concentrate on ethical values. Jones (2014) puts it there is a thrust of interest in analytics as one of the important priority in HR today. There is enormous growth since as it not only provides valuable insight for management but also helps HR Executives in decision making like performance appraisal and various other functional areas of HR. The importance of HR analytics has been shown in the report of the 4th HR Analytics India Summit 2019 that the HR analytics market will breed at a 16% CAGR towards \$1.87 billion by 2025 from \$430.9 million in 2015. The report also stated that HR analytics will develop workforce performance, reduce operational costs, and invigorate business development. The Hindustan Times Shine Conclave (2019), which concluded on January 17, discussed that evolution of HR analytics has impact on company performance

The edge with HR analytics is that it is factual and helps the organizations in taking rationale decision making process in evaluating the necessities in HR investment areas thus saves the lot of money for organizations (Sharma, V et al, 2022) setting a mark in prioritizing the footmark of HR investment for the business. HR analytics has changed into a serious business function from a technical specialist function, developing in manifold way reaching to the executives , line management and core groups in various organizations experts have opined that HR analytics will certainly upgrade the standards of HRM and eventually leverage the business growth. Interestingly, it is pertinent to mention that the research conducted by Oracle published in the Harvard Business Review confirms that most organizations

worldwide, have strong HR analytics stand. Most of the people recognize Human resources as is a people-oriented considering its advantages. The demand for HR analytics is expected to exceed 1 billion USD annually by 2022 clearly indicates a relatively careful, positive outlook required on its implementation (Angrave, 2016). Undoubtedly HR analytics will prove to those people who consider HR is only limited to issue offer letters and inductions as wrong with the strategic usage of HR analytics ,it will prove to give good results by reaching to the bottom line which eventually motivates the HR team by changing the course how HR operates. Interestingly, Information technology (IT) industry is the area where HR analytics is intensely and increasingly applied. Human resource analytics is surging forward to achieve the desired objectives related to human capital decisions with accuracy as it is evidence based obviating the intuitionism and experience.

Information Technology (IT) is the use of computers to store, retrieve, transmit, and manipulate data . it is one of the fastest growing industries in India and across the world. The IT industry has built very valuable brand equity for itself in the global market. The information technology (IT) can be classified into IT and ITES sectors. Marler and Boudreau (2016) done an evidence-based review of HR analytics, and define as "A HR practice enabled by information technology that uses descriptive, visual and statistical analyses of data related to HR processes, human capital, organizational performance and external economic benchmarks to establish business impact and to enable data-driven decision-making" .

Analytics is the evidenced based process of finding and transforms the data into meaning patterns. It helps to mould the raw data to arrive meaningful decisions. Analytics relies on depends on statistical tools, software programs, and operations research with a view to measure and to ultimately gain ideal meaning of the data . It is principally useful in areas with lot of data or information.

Business Analytics refers to the application of skill, technology, practices for continuous study and analysis of past business performance to gain insight and guide future business growth. Business analytics concentrates on developing opportunities

and understands of performance of business based on information and statistical methods.

Roslyn Vargas (2018) has found though the HR department knows the positive impact of HR analytics, they are lagging in adopting the same due to individual's decision. Human resource analytics (HR analytics) is an area in the field of analytics that mentions to application of analytic processes to the human resource department of a company with the aim of developing the employee performance leading to improved return on investments. It is not confined for mere collection of employees data but aims at entering into every process in depth so as to make decisions with the collected data besides enhancing the processes .It is also adjudged as a process to understand how investments in human capital assets put in to the success of four outcomes: (a) generating revenue, (b) minimizing expenses, (c) mitigating risks, and (d) executing strategic plans. This is done by applying statistical methods to integrated HR, talent management, financial, and operational data. There are three types of analytics and they are:

- **Descriptive analytics** acquire information from historical data with the help of reports , scorecards, clustering etc.
- **Predictive analytics** engage in predictive modeling using machine and statistical and learning techniques like statistical regression analysis, workforce planning..etc
- **Prescriptive analytics** recommends decisions using optimization, simulation, etc.

The terms HR analytics, people analytics, and workforce analytics are frequently used vice versa. However, there exists a difference among them. HR analytics deals HR function, like recruitment e, cost of training, and periodical promotion. All these functions are carried on by HR for HR. People analytics, though agreeably used as a replica for HR analytics, but it is technically applicable to “people” in common. Workforce analytics is a relating term referring exclusively to the workforce of an organization. It includes employees at work place, off site employees, peer group, self employed, consultants, and any other individuals working in different capacities in an

organization. As far as the HR is concerned few HR analytics functions and Workforce analytics functions though differ at times but similar in nature very often.

HRA will take HR profession to the new heights by proving as a true strategic business partner. For example, the HRA will help in accurate assessment of manpower so as to gain benefits and also to avoid the deployment of manpower where it is not economical .HRA is now being considered as the most wanted not only locally but also assumed significance internationally also. There is a paradigm shift of HR functions which have been in use for more than two decades. HR Analytics implementation depends mainly on Human Resource Information Systems and it's integration as a result of technological changes since 2000. The implementation of HRIS from manual process has shifted to speedy process using technology, resulting in increase in the capabilities of the organization. Organizations are concentrating on HRA as it is an opportunity and as necessity (Bassi, 2011). HRA is gaining importance as the implementation of HRIS is outsourcing more reliable data. Thus the HRIS is leading to the growth and implementation of HRA as it leads to profitability (Bassi, 2011). HRA is helpful in analyzing the behaviors of employees and predicting them and helps in using the human capital effectively and efficiently in order to benefit the HR investments. As per Ranjan and Basak (2013), “the scope and approach to HRA should be determined based on contextual factors such as objective, internal readiness, investment appetite, and target timeframe to achieve the objective” (p. 1).

1.2 IT industry in India

(NASSCOM,2019) reports that there are around 15000 IT companies in India and Indian IT sector provides 4 million direct employment and 12 million indirect employment. India's IT and business services market is projected to reach US\$ 19.93 billion by 2025. IT sector leads the market size with a revenue of 99 Billion USD for the fiscal year 2021. The revenue of US\$150 billion was from exports. IT sector is one of the sectors that makes notable contribution to nations GDP. 8% of India's GDP is from IT companies and expected to reach \$5 Trillion by 2024.

Figure 1.1 IT Industry - Market Size

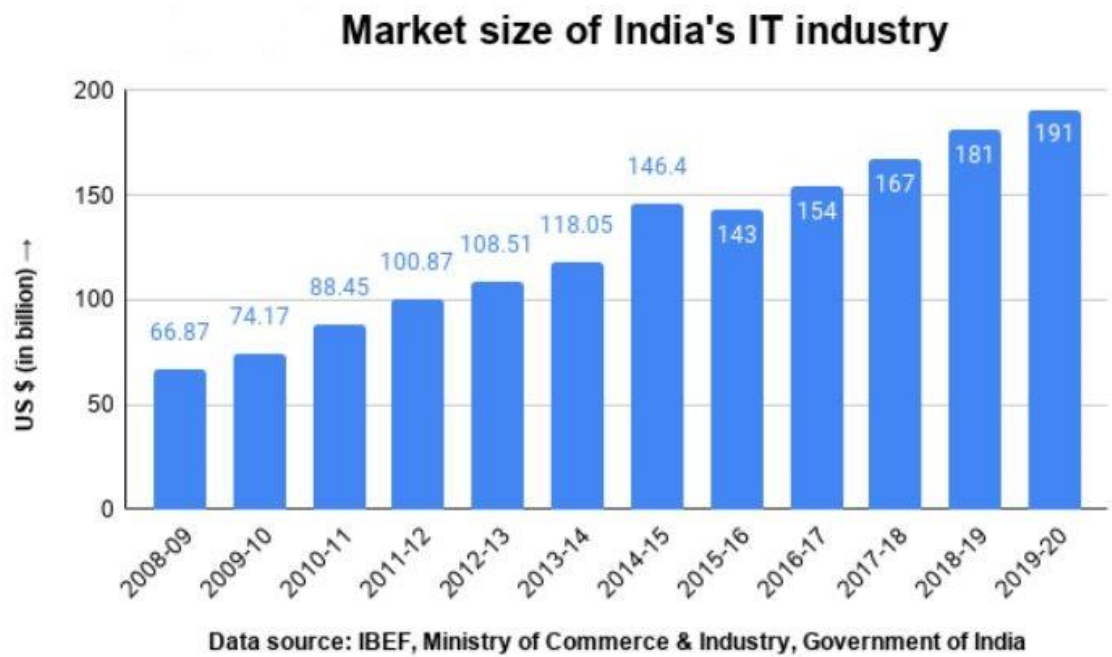
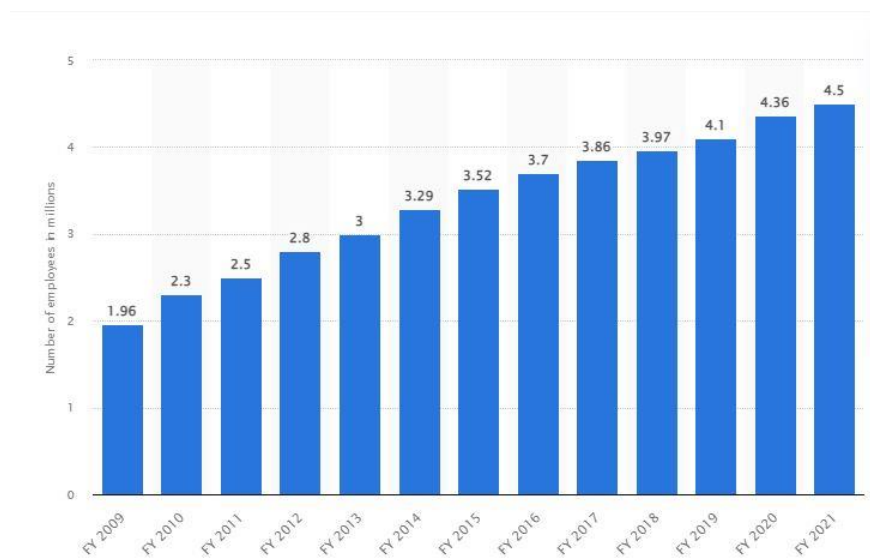


Fig 1.2 – Employment Generation in IT sector



Source © Statista 2022

1.2.1 Contribution of IT Sector – Domestically

For any sector to be called a major contributor, it has to have impact domestically and globally.

Indian IT sector contributes domestically and globally.

IT Sector contributes domestically by way of

Figure 1.3 Domestic Impact of IT Sector in India



Source: CACM, 2019

1. Export Growth : Indian IT sector contributes 7.9% to India's GDP and is the main contributor of Forex market in India. Over 25% of exports are from IT sector
2. Skill and Generation of Employment: IT industry is the leader in providing employment especially to middle income families. As IT industry demands digital training, people tend to get trained and NASSCOM has initiated many programs which leads to capability development.

3. Empowerment of Women : Women workforce is 30% in Indian IT sector, thus helping empowerment of women
4. Investment: Indian IT startups have pooled lot of investments and many companies are looking India as a potential source of establishing their companies.
5. Digital India : With the technology lead to capability skills made India become Digital India.

1.2.2 Contribution of IT Sector – Globally

Cost optimization and quality: IT contribution towards cost minimization and quality improvement has lead to increased shareholder's return and have saved over 500 US\$ in the previous years.

Global delivery model: By adopting to CMM level, the Indian companies have become delivery center for most of the developed nations.

Global innovation and digital transformation: The companies started filing patents and copyrights for past few years and adapting to digital technology.

Figure 1.4 Global Impact of IT Sector in India

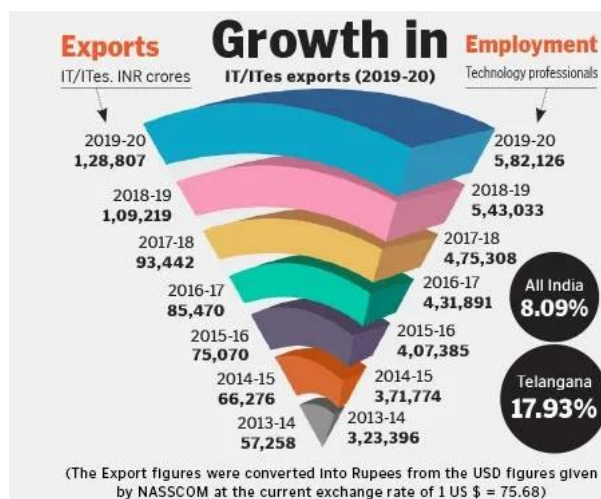


Source: CACM, 2019

1.3 Importance of IT sector in Hyderabad, Telangana

About 98% of the IT companies are located in Hyderabad, Telangana. The industrial policies and ease of doing business led to establishment of IT companies in Hyderabad region. This led to win- win situation as the IT sector. The IT sector is contributing not only to Telangana state GDP but also leading to employment opportunities. The growth rate of IT in Telangana is 17.93% compared to all India growth of 8.09%. This growth is tremendous and a national export is 23.5%. There are nearly 1500 IT companies in Hyderabad that employ over 5.8 lakh professionals, besides providing indirect employment to over 7 lakh people.

Figure 1.5 Contribution of IT in Hyderabad, Telangana



Source <https://t-hub.co/news>

1.4 Relevance of the Study

1.4.1 Theoretical Relevance

The ambit of articles on HRA is yet limited only when compared with the interests being accorded and the expansion of HRA, the research conducted hitherto is deplorable; however, as there are only few companies implementing the HRA on long term on their functions can be considered as a reason for research gap. The present study is a mixed methodology approach; the qualitative study helps in exploring the effects of HRA in companies which are already implementing thus bringing out the

insights and effect of implementation of HRA as a strategic business partner in various basic dimensions considering its infancy stage. In order to test this assumption, this study analyzes the experiences of companies with the effects. Though, a broad scale testing of this relationship is not yet feasible, due to the rather low percentage of companies that are actually using HRA at this moment in time. Nevertheless, an exploratory study through qualitative interviews with companies can deliver first insights into the effects of HRA on the position of the HR function and then the study uses quantitative methodology to test the relevant variables.

1.4.2 Practical Relevance

Most of the companies knows that HRA is future and there is necessity to invest for successful implementation of HRA. However, studies proves that there is a gap in the companies which think the implementation is important and their readiness to implement , . The importance of human capital is increasingly being acknowledged and more and more companies start investing in the tools to engage in data, metrics, and analytics in the field of HR. However, before such investments are being considered, companies should know whether HRA can help them in achieving their goals. Without an analysis of the actual effects of an HRA adoption, companies cannot be sure that their investment will pay off in the aspired extent in the end. Therefore, this study can also be considered as delivering valuable insights for companies that are at the stage of deciding whether an investment in HRA is the right step for them. Analyzing the effects on the one side and the influence of contextual factors on the other, this study can be used as input for companies when deciding on their likelihood of success with HRA, this is achieved by way of quantitative methodology. The quantitative methodology helps in testing how different dimensions of HR Analytics varies.

1.5 Concept of HR Metrics

“HR metrics is a measurement that which can be measured by counting, by quality, quantity and time”. Said by many of the HR professions.

HR metrics are used in the organizations function as core value. This HR metrics helps the organizations to know what actually the business needs to develop. It is an accountability tool which acts as an easy model for the company if they are producing any results and also deals with different kinds of elements like quality, quantity, money this metrics mostly work to satisfy the organization needs in order to reach its benchmark. Establishment of metrics leads to guide the HR practices and also increases the HR capital it encourages the organization to make a strategic decisions related to human capital.

- Investment in HR metrics represents the 60 to 70% of the operating cost of human capital and also provides a competitive advantage.
- It also maximizes the return on HR investments.

1.5.1 Criteria to select HR metrics:

- Depending upon the organizations position in the market as if the company is fit to the corporate culture than metrics related to the time need to be selected.
- It should focus on critical success factors
- And also on issues that which needs to be reported to CEO of the company.

1.5.2 Common Metrics tracked by HR analytics to improve HR Interventions for Business Growth:

1. Revenue Per Employee:

Revenue per Employee = Total Revenue of Company / Total Employees

2. Offer Acceptance Rate:

Offer Acceptance Rate = Total Number of Job Offers / Total Job Offer Acceptance

3. Training Expenses Per Employee:

Training Expenses Per Employee = Total Training Expenses / Total Trained Employees

4. Training Efficiency:

Analyzing the efficiency of employees before and after receiving the training

5. Voluntary Turnover Rate:

Voluntary Turnover Ratio = Voluntary left Employees/ Total Employees

6. Involuntary Turnover Rate:

Involuntary Turnover Ratio = Involuntary left Employees/ Total Employees

7. Time to Hire:

It is the days taken for HR to hire a selected candidate like time between offer issued date and joining date

8. Time to fill:

it is the time required to fill a position , the time gap between advertisement and joining

9. Absenteeism:

Absenteeism = No of Days missed / Total working days

10. Human Capital Risk:

This may include employee-related risks, such as the absence of a specific skill to fill a new type of job, the lack of qualified employees to fill leadership positions, the potential of an employee to leave the job based on several factors, such as relationship with managers, compensation, and absence of a clear succession plan. HR analytics can be used to measure all these metrics.

1.5.3 Benefits of HR analytics:

As we know HR analytics gives the authority to make data –driven decisions in order to attract, manage and retain employees which help to improve the ROI. It also helps the organization in making strategic decisions.

Better hiring process: HR analytics helps HR to take the decisions based on the past historic data. This allows recruiter to learn more about the candidates.

Reduced talent scarcity: when there is a scarcity in talent for specific role or industry with the help of HR analytics it is easy to find the candidate who is fit for particular position. The data-driven recruitment strategies provide accurate information.

Process improvement: Once the data is provided to the company experts than it is used for recruitment process much quicker and faster in an easy manner.

Attrition: HR analytics plays an important role in order to identify the retention rate of the employee and also the reason why the employees leave the organization and also why they stay.

1.5.4 Disadvantages of HR analytics:

Along with advantages of HR analytics it has some of the disadvantages as mentioned HRs deals with the large amount of sensitive and confidential data. Security and privacy are the major concerns the HR analytics handling this data must be designed as unauthorized access and the system must be constantly monitored to avoid data theft and this leads the highest cost and secondly acts as a disadvantage to implement the HR analytics.

1.5.5 Method to use HR analytics:

Long term planning and strategic decision making: This helps organizations to take to analyze the use of data ROI which leads to make better decisions.

Using automated tools: The use of automation process and tools reduces the errors and gives much time for important tasks.

Building an analytics HR team: Building HR team helps in working towards digital transformation in human resource department.

1.5.6 HR analytics tools:

There are various types of HR analytics tools different organizations use different tools as per their requirements and skills. The following are some of the HR analytics tools that are used by the organization.

- **R:** It is a statistical analysis and visualization which explores the data and cleans the data sets of millions of rows of data many of the organizations use this tool.
- **Python:** It is one of the programming languages which can be interchanged with the tool R.
- **Excel:** HR analytics basic version tool is MS-Excel when the data is manually extracted from HR systems it represents with comma-separated values those files can be easily opened and edited through excel.
- **Tableau :** is an advanced analytics software where dashboards can be maintained easily and different file formats are accepted
- **SPSS :** It is a software which is used mostly in research activities

1.6 HR analytics and Decision making:

As the technology is changing the adoption of HR analytics is increasing day by day. HR professionals examine the data and the outcome of this helps the organizations to concentrate on profitability aspects for the betterment purpose.

HR analytics plays an important role in the organizations for good results these analytics are examined in both descriptive as well as predictive point of views.

The use of HR analytics improves the decision making in various ways

- Firms profitability
- It also helps in workforce training as well orientation program.
- In demographic report of employee.
- Benefits of the organization based on revenue and training for workforce

- Improves customers safety and benefits of the staff

1.6.1 Use of HR analytics in IT companies

Many of the IT companies and large companies use this HR analytics as it results in effective, empower and also includes the engaged workforce that which adds value to the organizations.

The top companies use this HR analytics because they understand the importance and value of HR analytics.

The reason behind this is as successful companies have skills to acknowledge human capital.

Following are the reasons how HR analytics improve companies performance in some of the key areas:

- It helps in identifying successful employee
- Also identifies whether there is any talent or leadership gaps and what gaps can be predicted in the coming years,
- Identifies which of the top performers are at risk of leaving the organization.
- This HR analytics also helps in identifying the right candidate

1.7 Requirements to implement HR analytics:

- In order to implement the HR analytics company, firstly they need to choose the metrics and key performance indicators in order to track the records. As this helps in future of organizations capacity.
- Need to define the data sources to track the documents where the extraction of data from the sources will not be that difficult. This data sources includes employee scheduling software, Training systems...etc
- A proper tool must be taken it might be an existing stock or custom.

- A skilled team to be arranged and it must include HR manager, data engineer, data warehouse developer, database administrator, data analyst, front-end developer.
- The organization need to set up the data infrastructure like extracting the information, transforming data, loading the data into data warehouse (ETL processes)
- The main goal of the implementation of HR analytics is to develop the phase of predictive model.
- Organization need to develop the UI (user interface) solutions
- The organizations need to train the employees how to use this system in the organization.

1.8 Impact of analytics on HR:

In order to improve the HR industry in the organization they need to change the demand of digital era the companies need to explore in three of the categories of HR professionals which is positively impacted by HR analytics.

- Performance and efficiency: organizations measures the Human resource activities based on tracking metrics which offer valuable insights and looks after how well this process is performed.
- Recruitment and hiring process: Many of the organizations have a target to fill the open positions of the company with skilled candidates and it is a time taking process in order to reduce this time taking process a data analytics are used as this helps HR professionals to understand who is best for the specific role.
- Employee experience: Monitoring the performance of employee and their attendance helps the HR professionals to understand overall employee experience.

1.9 Future of HR Analytics:

In the corporate world artificial intelligence has created its position of a high set benchmark the future of HR analytics is the artificial intelligence which is changing the workforce environment of the organizations it not only changing the performance of the organization but it also changing the way of the organizations approach towards HR analytics.

1.10 Challenges and opportunities of HR analytics:

The following are the challenges faced by many of the organizations even though there is a rapid growth of HR analytics organizations are not ready to adopt this HR analytics because of the following reasons.

- To utilize the HR analytics in the organizations professional and experienced candidate is required all the organization don't have high experienced HR professionals.
- Another drawback is the lack of availability of data.
- The implementation of data drives models in the organizations is very low.
- There is a need of changing the requirements in the practice of management.

This HR analytics are treated as cost benefited model but even it is cost benefited many organization do not come forward to adopt it because of lack of trained professionals as the experience professionals look for higher salary.

1.11 Research Gap

On the basis of this review the following research gaps are identified.

Firstly, the present studies are conducted on exploratory basis as HR Analytics is in infancy stage. Most of the present studies are based on foreign countries or developed. As India is a developing country requires to study about the adoption of HR Analytics.

Secondly, from the available research, it is understood that HR analytics is composed to march forward from statistical reporting to evidence-based predictive decision-making. Consequently, it is requisite to move ahead into more of evidence-based HR practices and to understand the necessity for such practices.

Thirdly, it was also analyzed that the future of HR analytics could exist as a separate function as it increases the performance of the organization; however, only little studies have been done on how it increases the organizational performance. This throws a sizeable challenge which needs to be addressed by future research.

Finally, in spite of the fact that HRA shall have results with evidences, the studies on HR Analytics are very less in academic research and also in IT industry. We provide potential suggestions on how to implement HR Analytics overcoming the challenges and barriers and advocate directions for future research.

1.12 Outline of the Study

The study aims in identifying the variables through qualitative research using one to one interview with the help of structured questionnaire. The interviews were conducted on Middle and Upper Level HR population of IT companies that are using HR Analytics in their organizations. The study first contributes in identifying the HR Practices that are result of HR Analytics. With an objective to understand the present state of level of HR Analytics i.e Descriptive, Predictive or Prescriptive analytics , the reasons for using HR Analytics is known. As any organization implements technology that helps in improving the organizational performance, the same is considered for this research. As the HR Analytics is in infancy stages and still the companies are bothered on how to implement, the study aimed at identifying the factors that are helpful in implementation of HR analytics along with challenges and barriers in using HR Analytics is also drawn.

In order to know the deep insights carried out qualitative research and after identifying the required dimensions , as there is lot of methodology gap, it is thought to conduct quantitative , where as we can frame and test the hypothesis framed with the help of qualitative analysis.

After the qualitative and quantitative analysis, the study suggests and recommends various aspects of HR Analytics and helps the industry to understand better, where they are lacking and how to overcome.

1.13 Conclusion

Employee welfare, Employee Engagement, Employee retention, Employee satisfaction, Strategic decision making are the buzz words in any Industry, especially in IT industry these are very routine. The companies are trying to achieve these. One such tool that can help is HR Analytics as HR Analytics helps in employee satisfaction by reducing the biasness and increases the employee engagement and retention rates by understanding the employees. The various dashboards help the management to take strategic decision making. Hence, there is an urgency to implement HR analytics to implement at all level across different functional areas of the HR. As HR Analytics is in infancy stage, this study helps in better understanding and implementation of HR analytics.

CHAPTER II

LITERATURE REVIEW

2. Introduction

In emerging technology, information technology (IT) play significant role in all types of industries and sectors. Human resource (HR) is essential for managing a company, it works and maintains organizations performance and growth. In early days of HR department all working process of HR is done by manually, when technology growth reaches peak, this department slowly started to adopt IT in HR department. HR analytics uses in information technology, provides HR practitioners for collaborating, organizing and analysing HR data which is related to function like managing, recruiting, engaging, and retain top most latent to aid to make better decision in large volume of areas. The large volumes of data are provided by HR department daily using technology and software tools. Our proposed system suggested various perspectives about HR analytics in IT industry. (Sharma, 2017) this paper focuses on the technology disruption in human resource and how HR Analytics influences the HR industry.

2.1 Empirical studies of HR practices in information technology industry:

Information technology industry had increased competition within different players. HR practices are emerged to implement IT in organizations. Hence, these practices are termed as iHRM. This paper especially focuses information technology in organizations of India (Xiu, Liang, Chen, & Xu, 2017).

2.1.1 Data driven approaches:

When an organization utilizes a data driven model, which mean a strategic decisions on the basis of data interpretation and analysis. A data driven practices offers companies for examining and organising the data with the aim of providing best service to their consumer and customers. HR analytics had been the way of analysing

and amassing HR data for amending an organization's performance. HR analytics makes incredible way of decision making towards employees and enhancing involvement towards in organizations.

The theoretical concepts of HR analytics and how it is making its priority in Human Resource Management and in most of the organization. The author examined that there is a lack of scientific research in HR analytics and the reason was considered as it might be because of innovative nature of HR analytics and how data driven practices (Kremer, K. (2018) are helpful for organization in decision taking. The development of HR analytics over past three to four decades has shown a strategic role over HR function of an organization.

The role of data driven practices on HR quality service and how it leads to innovation is explained after developing a conceptual framework which is validated using 141 small and medium sized enterprises in India. The study finds that quality data (Verma, 2020) is required to improve HR practices and service quality and innovation competency

Hence,(Yadav & Bhutada , 2020) this paper come up with inclusive approach and focusing the challenges of HR analytics in data analysis fields. So this study prepared data set which coalescence of survey data, management data and HR data. The results are performed with text analytics by implementing resume parser which screens the resumes and helps in supporting while recruiting. This study also cluster the data in the wordcloud which helps to identify the talents.

Similarly, (Yadav & Bhutada, 2020) this study also used Resume parser to screen resume and cluster data in word cloud for identifying the talents. This study also create five ways for creating data driven HR organization. Integrating and collecting employee data. Employee related data can be the treasure of behavioural trends which offers insights deeply into the employees, when the data had been related with some other business and information about the organizations. Identifying the performance by individually, department wise and operation unit produces data which can help to point out the challenges and uncovers efficient techniques and it can be speared widely.

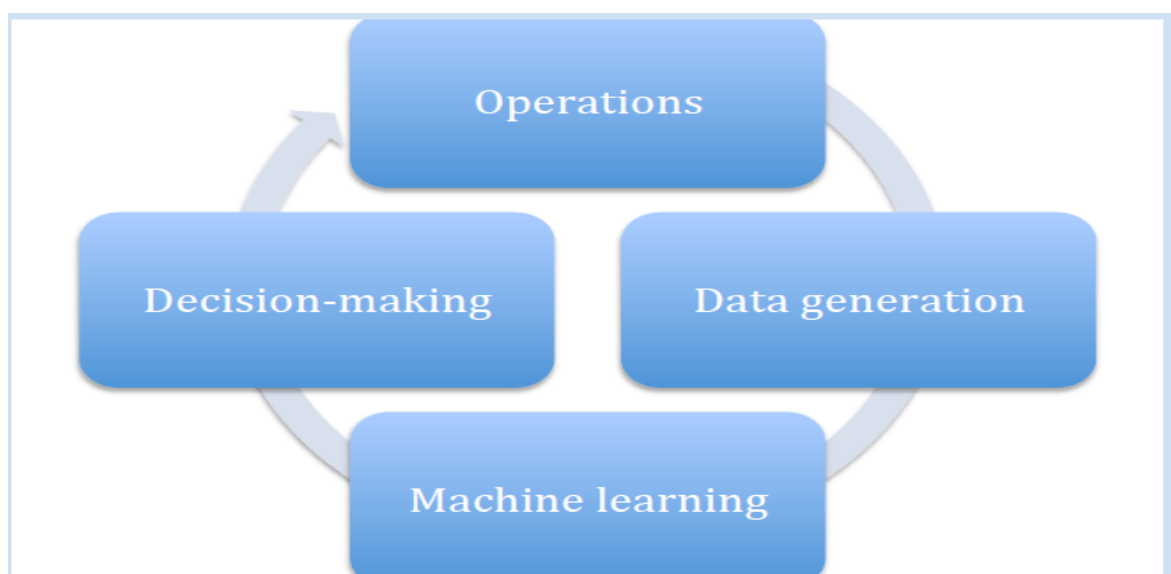
Monitoring employee engagement by tracking employee absences, survey responses, personal problems another related metrics. The employee engagement data shows about polices which are used for enhancing morale and performance and which are waste of time. (Liu, Huang, Wang, Xing, & He, 2021) This study data also reveal about the existing rules and policies which needs for revision. Reduces investigations about employee by using data analytics. The brief history of employee data are revised while promotion or other appointments. While generating these data, each investigation of employee can be done effectively and encourages use of these practices.

2.1.2 Artificial intelligence (AI)

Artificial technology which enables computer for learning and making recommendations actions on the basis of previously gathered data.

While in terms of HR management, AI can be implemented in various ways of streamline process and improves effectiveness(Singh). The aim this paper shows about the impacts of HRM practices in Indian information technology in companies. In present situation AI used for recruiting, monitoring, data analysing approaches and also doing the duties of HR.

Figure 2.1: A sample structure of AI supported HR practice



Source : (Tambe, Cappelli, & Yakubovich, 2019).

The above figure 2.1 shows about the AI implemented HR practices. The initial operation was to be the data collection and generation using AI tools. Next, machine learning stage had been used for the prediction of hiring a candidate by examining the performance of them. Indeed, in early stages HR human had some flaws in employment. Then, the decision making stage try to make prediction which had been produced by ML. The first point to fairness in appointment and second employees make use of computerize interviewing patterns.

Lengnick-Hall(2018) explains how organizations are trying their best to adopt Artificial Intelligence in HR practices in the current era and brings how technology play a strategic role in organizations.

In addition to, (Black & van Esch, 2020) this study also develops AI in HR practices in organizations. This study made two objectives first, digitalization redesigned on social landscapes and business. The digital recruiting had been the merging AI technology in HR practices. Second, practicing future and advanced AI technology in HR practices which improves recruiting effectively.

2.1.3Benefits of AI for HR practices:

AI had many benefits towards HR practices in organization. (Ahmed, 2018) This study explains about the benefits of AI in HR practices.

Saving time of recruiters by automating the high volume tasks:

AI for recruiting presents an opportunity for recruiting to decrease time spent of making tasks, time consuming tasks like automating the resume through screening, automates trigger assessment or schedules the interviews with candidates. It speed up the time and hiring process had been done easily and quickly for recruiting.

Improving the quality of hiring:

This (Yawalkar, 2019) study uses KPI back box for hiring and recruiting process. The data collection methods are become easier for accessing, gathering and analysing.

Cognitive supporting decision making:

This cognitive supporting decision making includes vacation requests, determines the mood of the interviewer, team training, hiring process.

Automatic repetition of tasks, low value add tasks:

AI provides an opportunity for automating the HR repetition task and low value add tasks and enhance the focuses on strategic work.

Employee engagement and well-being:

AI had been used for identifying the behaviours which causes poor performance. For safety AI finds the behaviours and experience which leads to tragedies.

Employee candidate management and self-service:

A new well designed chatbots which makes interactions easy and wisely.

2.1.4HRIS (Human Resource Information System):

In the changing world, evolution of technology meets new information techniques. HR managers are aware about the technology which increases the quality of employee information. To decrease the daily transactions and basic activities of HR, (Meenalochani) this paper deal with the more difficult transformation where all HR activities are converted into information technology by introducing HRIS (human resource information system) or HRMS (human resource management system).

By the inference of (Shahreki, Nakanishi, Jayiddin, & Ibrahim, 2020) this paper, academic and professional development of HRIS and it critically evaluates the growth of the organization. The connection among the technology growth in HR field, had been examined by four keys as client server, namely, cloud based, mainframe, web based system and ERP.

As the advancing in technique (Masum, Beh, Azad, & Hoque, 2018) this paper, a framework had been designed for HRIS and applies IDSS (intelligent decision support system) towards with KD (knowledge discovery) for improving structuring, semi structure HR decisions for processing the process. However, this study stores

HR-IDSS and process information with the AI tools as KD reasoning, ML and other techniques. These AI tools used for discovering information from past experience and data for supporting the decision making process.

This study attempted for investigating for IDSS applications for solving HR problems and implements hybrid techniques like ML and KD for prediction and extraction. Also, (Gary W Florkowski, 2018) this paper, finds the challenges and overviews of HRIS in organizations with virtual HR (virtual human resource), E-HRM (electronic human resource management) and B2E (business to employee) systems.

Using the Qualitative methodology, after data is collected from the several respondents the findings suggest that HR analytics will become an established discipline, and it proves the impact on business outcomes. The study brings how HRIS has evolved and is playing a vital role in automating the HR department (Van den Heuvel, S., & Bondarouk, T. 2017).

2.1.5 Statistical evaluations:

HR Analytics is a scientific phenomenon (Greasley, K 2020), which requires statistical tools to evaluate the data. It is also analyzed that such practices requires narrative and qualitative knowledge.

In the world of HR, statistics supports to capture, understand and predicts randomness of the world. It reduces risk by estimates doubts and shows the hidden aspects of HR daily process. In HR context, information are less biased and creates more objectives recommendations and decision using information technologies (Bos-Nehles & Veenendaal, 2019). SEM (structural equation model) with the help of SmartPLS software 2.0 M3 in (Muda et al., 2017) this study uses advanced statistical tools for data interpretation. As the result of this study, HR and IT had a positive and important influence with regional financial accounting system.

This study also recommends proper training for improving HR to increase quality of organizations performance. There existed two fundamental complex reasons of

statistical calculations: There exists more variation among individual units for real life processes includes HR processes. The large volume of data are calculated only by the statistical tools, using these tools employee must aware about the software and tool(Xiu et al., 2017).

2.2 HR analytics:

HR analytics is the data driven approach to manage people at the working place. HR analytics, is also named as people analytics, talent analytics or workforce analytics, focuses on people issues using data for answering difficult questions about the organization. This provides better and data driven decision making. HR analysts are accountable for finding and assisting to solve HR relevant problems, ensure these are attached to organizations objectives and policies. Evaluating and analyzing reports and data, finding feedback related to managers and advise to change and improve. The HR analyst role is generally related to large companies and categorized as the entry level position. Works closely with the HR director over complete function, a best HR analyst has perfect interpersonal skill and strongest in communication and also critical problem solver as well as capable of working with data.

Due to the job demands this (Gary Walter Florkowski, 2019) paper identifies the technological stress in HR department and evaluating technological stress and explains responsibilities of HR analytics to overcome this stress are as follows: Identifies and works with HR team for resolving different HR relevant problems. Communication with customer to help and solve problems with trouble shooting and any client business needs. Assisting with HR investigations and job audits and follows up with related parties. Delivering and creating specialized training and presentations on HR relevant subjects over the business. Offering supports and advice to various department on organizations with regards to HR processes, best practices and policies.

Presenting and analyzing reports and data to suitable area to find errors, expertise and advise about solutions. Helping HR team to moderate and progression of guidelines, operating policies and systems for encouraging good practice among the company. Review candidate and employee data and inputting into related HR data bases.

Supervising potentially with training and offering coverage and collecting feedback of staff performance. These suggestions are intended to implement in HRT (HR technology) and IS (information systems) in (Gary W Florkowski, 2020) this study and identifies the macro level factors which influenced the performance of HRT systems. The second objective of this study to assess the HR goal to make organization satisfaction towards with HR services.

2.2.1 Process of HR analytics:

The process and functions of HR analytics plays a significant role for creating best information technologies in HR industry. The primary step to gain knowledge about the process of HR analytics. Thus, (Soo, Tian, Teo, & Cordery, 2017) this study investigated the role of HR analytics to enhance HR practices in organization innovative performance. HR analytics promises to obtain problem solving techniques, data are collected first. The data needed to be supervised and calculated over other data, with norms or averages, historical information. This study assists to find patterns and trends. At this point, the results are analyzed at the analytical stage. The final step to implement insight into organizational decisions. Hence, these are basic process of HR analytics.

Employees must know about the organization and organizations must provide proper training about organization environment and surroundings hence,(Saeed et al., 2019) this study introduced Green HRM form various organizations attractive practices relevant for protecting environment and maintaining ecological balancing. The goal of this study to examine the effects of green HRM practices such as green selection, recruitment, training and development, appraisal, management, reward and compensation and empowerment on employee pro environmental behaviour. Online training programs are intended in this study to learn about organization management towards employees.

(Rahoo, Khan, Khan, Khan, & Memon, 2020) this study used random sampling techniques software to select employee in recruitment processes. The main findings of the study explained about the training programs must be provided then only it may be

the convenience method for selecting employee process. This study also provides E-performance management system for calculating employee's environmental performance and this used for finding green employees or employer. The study suggested to conduct online training programs for employee regarding the environmental issues and recruiting employees who are unknown to green HRM so it will increase employee engagement participation and reduces employee turnover.

2.2.2 Employee training structure and material:

HR experts struggle for improving employee engagement. Improving employee engagement can boost up the productivity but challenges are still remain. HR analytics can offers insights for making better measureable factors like performance, recruitment, benefits and pay, enables HR department to lookup into to improve productivity of employee. Responses and feedback are collected during appraisal which is related to improving culture of company and creating a better working environment.(Alikaj, Ning, & Wu, 2021) this study examined the proactive personality and creative behavior on employee at work.

By adopting quantitative correlation analysis from the data collected from 302 respondents with a view to understand the impact of HR Analytics on training and development strategies(Barbar, K,2019)., it is found that the HR Analytics plays a vital role in revising the training programs as per skill sets of the employee

This analysis reveals the employee engagement towards their work. HR analytics helps to improve employee engagement towards work. A Successful business depends on the status of skill and expertise of workforce.

Due to the job requirements and technology are stably identifies and evolves and communicates capabilities or core capabilities necessary. Employees must be capable for maintain and learning skill for keeping up with business essential. This issue can be discussed through learning module which supports for defining individual learning on the basic of career matrix identifications or organizations goals and competency for employee. Once these capabilities are known to organization this compare gaps

and rectifies them.(Marler & Boudreau, 2017) this paper discussed about the HR analytics process and skill development to employee which had been needed for HR analytics in organizations. Benchmarking can enhance performance. For leveraging the result of data analysis for feeding back business strategy.

2.2.3 Effect on work culture:

HR department can leverage on many KPI for finding keys for retention or boost up the performance of work force. Ensuring HR team which has right talent for drilling and analyzing into HR related data. HR analytics more than analyzing, to plan ahead. (Alsuliman & Elrayah, 2021) this paper focuses on individual level adoption of HR analytics by human resource professionals.

The main aim of this paper to understand the importance of HR analytics and gaining insights to overcome the barriers which affects while implementing HR analytics in the perspectives of Saudi HR professionals. Management needed for equipping with insights on workforce required for improving efficiency and for achieving their best. HR analytics allows managers for easily gaining valuable view into the work force attitudes and performance.

(Canedo, Graen, Grace, & Johnson, 2017) this paper brings workplace change and using information technological tool which enables business to improve their business in high standards. These change impacts information technology tool in HR industry and HR professionals must be more efficiency and bring new value to business enterprises.

2.2.4 Reasons for Attrition

By applying statistical tools and data mining integrating with machine learning is helpful in predicting the attrition of employee and reasons for attrition based on past trends and current scenario (Srivastava, 2017).

By using the IBM data set of 1500 samples, by applying HR Analytics, Gaussian Naïve Bayes classifier , identified that monthly income, age, overtime, distance from home are found to be factors for attrition of employees(Fallucchi, F, 2020)

2.2.5 Employee Participation

Davenport *et al.*(2010) points out that the HR Analytics has no significant effect on employee commitment by explaining with the help of mistakes done during implementation of HR Analytics.

Shaji A. Khan(2016) through exploratory study done in twelve small and medium sized in China, found that HR Analytics negatively effects the employee participation as this technology not consider the employee problems.

An exploratory study (Liu, G., 2010) from semi structured interviews examines that the This study relies on information gathered through 43 semi-structured telephone interviews identified three types of employee participation i.e direct, indirect and individual and concludes that direct and indirect participation has more effect due to increased social values.

2.2.6 Reduced Bias

The study (Bhumika Rathore, 2022) is done after finding 25 relevant articles found that Artificial Intelligence helps in reducing the bias, however proper training should be given to eliminate the human bias, the biasness in age, gender, racism...etc. If such training is given it helps in balanced decision making.

The paper (Korherr, P, 2022) brings out the process of migrating from intuition based decision making to evidenced based by conducting single case study with 22 semi structured interviews in a German public manufacturing company and identified the factors such as behavior of the management, strategy of the management,

infrastructure facilities, rules and regulations, and culture that help for evidenced based decision making.

2.3 HR analytics in decision making:

Data analytics enables executives for making decisions on the basis of statistical facts. Those facts can be used for guiding choices about the future of the company growth by evaluating a long term goal of competition and market. These executives make critical decisions and operational decisions. (Jain & Jain, 2020) this study focuses on HR analytics on the EBDMS (evidence based decision making system) had been the modern advanced form of DSS (decision support system) that aids for making strategic decisions. These Machines work with complex integrated methodology. (Mohammed & Quddus, 2019) this study intended four levels of analytics for making better decision on HR analytics:

1. Operational reporting: This level had been the basic level of HR analytics for understanding available data and draw conclusion about HR operating system.
2. Advanced reporting: The important difference between from level 2 to level 1 had been the frequency of data reporting. This level explains about routing, proactive and automation.
3. Strategic analytics: HR departments operate level 3 the initial stage of HR analytics. These analytics help effective outcomes, HR professional and assessing driver of turnover
4. Predictive analytics: the highest level of HR analytics and this had been the mature level of making prediction of decision making. It uses only data to predict decision on organization.

Similarly, (Reddy & Lakshmikeerthi, 2017) this paper suggested EBHR (Evidence based HR) had been a decision making process combines critical thinking by using best scientific evidence and BIEBHR (business information evidence based HR) uses analysis, data and research for understanding the relationship within people

management practices and business sources outcomes, like customer satisfaction, profitability and quality.

With the aim to understand the impact of the parameters i.e organizational nature and organizational tenure that help in decision making in using HR Analytics, (Afzal, M., & Ansari, A. H. (2022) by adopting quantitative methodology using SEM model , identifies the parameters such as innovation, talent management and quantitative knowledge plays a key role in decision making.

In a doctoral thesis (Thüsing, K. 2021) , with a view to examine the impact of decision making on stakeholders with the help of HR Analytics, qualitative methodology using systematic literature review and case study has been used and found that evidenced based decision making is possible through adoption of HR Analytics, however, there is necessity to improve the quality of data.

The development of HR and its integration with the technology helps in strategic decision making. The study also focuses on impact of infrastructure and technological innovations by using secondary data and found the key parameters that help in decision making. It suggests that more concentration should be done on predictive modeling (Mohammed, 2019).

2.4 AI used for sourcing job applicant:

AI change recruiter among the augmented intelligence which allow recruiter for becoming more proactive for hiring, helps for determining a candidate culture for fitting an improving the relation towards hiring managers through data for measuring KPI as quality of hire.(Maduravoyal, 2018) this work focuses on recruiting technology allows recruiter to have better leverage on ATS , provides the ability for hiring more effective, short listing and screening resume with fairness.

In the study to understand the Artificial Intelligence platforms, after employing systematic literature review from manuscripts from 2015 to 2021, the study concludes that Artificial intelligence is used for initial stages of recruitment (Saad, M. F. M, 2021) like profile screening, matching the profiles with the requirements, pattern

recognition through voice and facial expressions. It is found that Artificial Intelligence practices are used during the preliminary stages of recruitment but not in the entire process of recruitment.

2.4.1 Identifying suitable employees and recruiting:

AI recruiting the application of artificial intelligence for talent acquisition process when machine learning used for short listing candidate as well as the automation of manual tasks in the recruitment process. (Barboza, 2019) this paper uses information technology AI for recruiting process and looks into the state of art on artificial intelligence and the impacts of HR analytics. Not all AI uses are helpful to HR analytics may be it had challenges, so (Ranjitha & Usha, 2021) this study explained some steps to rectifies AI challenges in HR analytics and discuss about various uses of AI in management studies. This study explains that AI can also be implemented in Warehouses and Automation other than development and training department. AI in HR had various benefits but it had some violation in data privacy. So the organization makes precautionary measures for overcoming these privacy issues before executing AI.

But AI cannot be used in all sectors of HR management; most of them can be effectively used by AI. This study also suggested that an organization must hire well trained candidate and skilled employee, AI helps to recruit best candidate for employment. Even though, AI had best uses in HR sometimes it causes Human Bias. The efficient execution of AI in HR will improves employee engagement at working place.

2.4.2 Artificial intelligence chat bots are used

An HR Chabot means a virtual based assistant used for simulating human communication and conversation with employees and candidates and it automates particular tasks like employee referrals, candidate screening, interview scheduling and more.

(Mohan, 2019) this paper explained details about uses of chat bots in HR analytics:

- A chatbot can handle the daily challenges and ensuring the recruiter life as less complication by reducing the hiring works.
- Short turnaround time lowers the candidate fear and it helps them to move on to other carrier opportunities.
- Chatbots helps to assess the feedback by scaling them but this had been not possible as human level interpretation.
- Using AI, many number of candidates can accommodate into hiring process at same time, and notifies to recruiter when they completed initial screening tests.
- Chatbots analyses facial expressions, speech and voice modulation for integrating the cognitive elements in recruiting process.
- Chatbots moves the candidates by replying the queries and arrange interviews and scheduling remainders and following up the conferences.
- HR chatbots conducts effective initial interview process by eliminating unconscious recruiter biasness.
- HR chatbots can decrease the depletion level by offering insights on employee satisfaction, engagement, productivity and also motivating the staff by interacting with them.
- HR chatbots can influence the information form PMS (performance management systems) for matching the objectives of performance analysis and integrating with awards and recognition.
- HR chatbots offers information related to the best performer, future learning modules and suggesting areas for improving to the employees.
- Chatbots helps to measure employee emotion level, checks their engagement levels and identifies potential of employee(Egorov, Lebedeva, Prokhorova, Tsapina, & Shkunova, 2019).

Figure 2.2: Benefits and functions of chatbots in HRM



Source : (Majumder & Mondal, 2021)

Chatbot automatically routine the process of candidate screening, if they got selected, it provides training and FAQ responding to candidates, then finally collects feedbacks form candidates. This (Mohan, 2019) study also discussed about the new chatbot introduced in India, named as Phenom Chabot which allows candidates for searching jobs, asking questions and getting answers about the standardized companies and receives job recommendations personally. This company had been a Hyderabad based hiring startup companies, which pre-screening resumes automatically for companies and certifies if the candidate had been good or bad or average by their past hiring patterns.

2.4.3 Artificial intelligence helps in performing employee background checks (social media)

The social media screening tool helps to identify and checks the employee background. The organizations conducting background checks when hiring an employee to higher positions and also promotion of an existed employee for enduring there has been no conflicts and mismatch occurs. When screening through applications while lining up in interview pipeline, organizations must verify the individual and evaluating the information through social media platform for cross checking the candidate resume. The organizations go beyond to networking platforms for analyzing the candidate photos, posts, interests in social issues etc.

Hiring the good employee who also has good cultural perspectives, assessing them inside and outside of working place, evaluating how candidate handle pressure in office room(Geetha & Bhanu, 2018). This study mentioned social media background social media checking for recruitment process. Negative social media comments and posts changes the perspectives of candidates, the comments with racist or radical comments reflects in office and working environment of candidate. The negative perspective candidate always being negative towards the organizations rules and regulation, neglects knowledge facts of organization. Unknowingly, most of person making visible their private posts and comments to all of them, it leads to increase social media violation. Thus, the social media browsing creates the challenges to employees as it makes hard for them to draw line between online life and personal life.

A theoretical model has been developed to understand the uses and threats with the application of HR Analytics (Chatterjee, S , 2021) , using SEM model to analyze the data collected from 315 respondents, it is found that as the privacy issues are highly important, this is not being used much in tracking the employee background and recommended for strong regulations to control data privacy.

2.4.4 Need for social media checking:

The foremost reason for using social media background checking to identify the inconsistencies in resume of the candidate. Many surveys indicate over half of the candidate application information are fake and resume with misleading information or exaggerate. Although, social media screening helps to identify the right candidate it has some risks such as human rights violation, creditability and consistency, privacy transgression. (Kaplan & Haenlein, 2020) this study discusses some steps to overcome the pros. of social media screening when compared to cons. Here a few steps are listed for avoiding these issues potentially in organizations to make social media screening as effective as possible. Arms & length evaluation, late stage review, law abiding process.

2.5 Organizational performance of HR analytics in IT industry

In organization, human resource management (HRM) refers to the system of HR practices for the particular job to enhance employee performance towards achieving organizational goals and objectives. The best HR practices will reflect positively in the organization towards high profitability and high demand in the competitive market based on employees' performance and credits. In some organizations, the employees were treated equally and in other firms they treat executive and non-executive employees in a different manner. (Turulja & Bajgoric) this paper explains some of the organizations that differentiate the several departments based on employee performances like production department, sales department, operational department, finance department and marketing department. HRM practices in the industries need to develop and implement effectively, to achieve organizational goals and to reduce employee turnover. The HR practices will satisfy the regulatory and statutory requirements as well as the operational requirements in an organization. It will increase the quality of work life and employee retention in the organization.

2.5.1 Information Technology improvement in organizational performances:

Nowadays, technology is an emerging trend that serves for all fields of industries and companies. Without technology there is nothing to be done in the digitalized world. Implementing technologies in various industries will improve the efficiency and effectiveness of project management. It will increase the productivity and operational level process effectively with automated systems.

2.5.2 Recent technological aspects in organizations:

(Shea, Usman, Arivalagan, & Parayitam, 2021) discuss about the latest technological aspects which are used in organizations.

Rise and fall of social media:

Similar to several new entities, social media was also found to be greatly overestimated; however we are now facing its backlash. Over the past decade, the organization is planning to optimize the utilization of social services thereby to obtain profitable and effective outcomes.

Reinvention of entertainment:

The applications and the linked devices modify the behavior of the customer and this criterion has not been noticed in entertainment industries. Hence this should be revolutionized by tools such as Google Glasses.

Three dimensional printing:

(Brockbank, Ulrich, Kryscynski, & Ulrich, 2018) Three dimensional printing has been observed to be more exciting and business changing that enables to print many interesting requirements. Mobile applications are redefining the service industries but the real facts of these services have to be made utilizable by all the fields. IoT is

emerging greatly and poses vital implications in day to day life activities with several key factors.

2.6 Increased employee performances

In the decade years, industries realized that achieving full potential is based on the technology involvement in the operational process in several departments of an organization. Job roles are dynamic and ever evolving in nature. It focused that how will the technologies helps to improve the overall efficiency of business and operational process by helping the employees to engage themselves to give effective and efficient output in the organizations. (Зачко, Ковальчук, & Кобилкін, 2021) this paper intended safety HR measures of technology. In HR practices, it could provide more efficient and effective result for improve the skills and knowledge of employee as a key term of success and it reduce the employee turnover as well as it increase the employee retention in the organization. For instance, the technologies will increase the quality of work life and it will create a job satisfaction of workers based on automated services. HR Analytics plays a vital role in developing human capital by identifying the skills thus creating leaders for tomorrow (Weena Yancey, 2015)

This paper examines the impact of HR Analytics on the willingness of the employee to improve performance (Anshu Sharma , 2017) or not by examining the changes bought by HR Analytics in performance appraisal. By developing a conceptual framework, it is found that the unbiased performance appraisals led to increased employee performance

However, developing a new product in the departments, the technology developments will helps the organization to frame the budget, size, marketing demands, promotion strategies and other factors to promote organizational performance and developments. Technologies will radically improve the effectiveness of organizational performances and it will increase company's productivity, profitability and creates demands in competitive markets. There is a need for effective HR practices to manage the employees and need to provide sufficient training process and based on the process the HR analytics will rate the employee performances. It is the most effective tool for

the organization to develop their performances and achieve goals based on the effective HR practices. HR analytics is a major technology based process which develops and enhances organizational performances based on technology based HR operations(Margherita, 2021).

2.6.1 AI enabled recruitment in IT industry

Artificial Intelligence is ideal intelligent software which used for organizational recruitments. It will screen automatically the resumes of candidates with machine learning technique. It will assess the performance of employees in their work productive rates and credit rates with giving effective output in the organization. In specific, it will learn existing employee performances based on their nature of work, skill, productivity and time management and it will process with the new applicants in the same field. It will update the detail of candidates based on their social media profiles(Margherita, 2021).

2.7 Improved employee engagement through technology

Implementing technologies in work place will increase the business process outsourcing and it radically changed the traditional system of organizational activities into modern organizational culture. (KHAN, ZHANG, & SALIK, 2020) In addition, this paper, technology developments will increase the business operations quickly and effectively. It will increase the communication strategies between the employees and organization through HR management process. In reality, many of the business owners were rely on technology based business process to create a demand in the competitive markets. Technical collaboration will helps the organization to communicate their strategies with their top level and lower level management in the organization.

In the organization, the work groups will helps the employees to manage their work task with automated process. These work groups will diversify the employee's perception regarding organization activities and culture. The virtual work group is a technology based projects that gave the ideas regarding the employees work

allotments and task and the period of completions. This work group will provide the technical assistance to the employees further providing the basic information about the works and task allotted from the employees in an organization.

The study with a view to understand the reasons for low employee engagement (Bakhru, K. M (2022) has identified that improving predictive analytics helps in improving the engagement levels. The study also identifies that HR Analytics as a source which can help in identifying the reasons for change in employee behavior.

2.8 Effective and efficient budget planning

With the rapid development of technology, organizations are moving towards intelligent decision making. The present study uses secondary sources identifies that the HR Analytics helps in optimizing the training budget and helps in changing the training programs within the allotted budgets (Reddy, P. R, 2017).

2.9 Reduced costs and increase turnover

Employee turnover is a crucial process which happening often in the organization. When the employees suddenly quit their job, there are no records or reasons behind that and it is a big question mark for the organization and HR department. These turnover leads to high loss and cost for the organization. (Zahra, Hameed, Fiaz, & Basheer, 2019)To remove these critical situations the HR analytics will perform their task to analyse the reason behind for employee turnover in organization. This process will do in the HRM department and it will provide further solutions and suggestions to avoid and reduce employee turnover in an organization or industry.It will collect the data regarding employee turnover and analyze the reason behind for employee turnover in the particular organization. Collecting data regarding employee performance and attitudes towards the organization including their productivity rates and credit rates. It correlates the both collected data and identified the reason for employee turnover in the organization. It develop many strategies and HR practices to reduce and avoid employee turnover in the organization

2.9.1 HR analytics in Recruitment

Organizations are seeking the fresh or experienced candidates, who doesn't has the right skill for the particular job and the HR analytics will provide the candidates with similar skills related to the particular work in the organization.

It selected the candidates with attire of having match with organizational culture and needs. Even though, extracting the numerous of resumes with basic organizational qualities and culture, this process will filter the candidate based on their norms. It is an emerging process, which used for the recruitment of fresher and experienced candidate in the organization(Turel, Liu, & Bart, 2017). This study explains process of HR analytics in IT industry. It enabled the quickest process of collecting data about the candidates from the various sources and software. It gathered the details about candidates based on their profiles from the social Medias to get accurate knowledge about the candidates. It identified the candidates with high qualified knowledge in the particular work and skill. It avoided the fake profiles and data regarding the details of applied candidates and it filter the candidates with appropriate skill and qualification. It enables the organization to hire the candidate for the long term process

2.10 HR analytics, key metrics on IT organizational perspective:

(Benitez, Llorens, & Braojos, 2018)intended three key metrics of HR analytics in IT organizational performance.

Organizational performances

The data has been collected from the employees in organization to understand and compare the labor turnover, absenteeism, recruitments and outcomes.

Operations

The gathered data will monitor with HRM department to determine the efficiency and effectiveness of organizations day to day activities, procedures and practices.

Process optimization

This process is done to avoid the errors in operations and process, which optimised the organizational process with engaged task of employees to run towards the organizational goal.

2.10.1 Examples for HR analytics metrics in IT industry

(Luftman, Lyytinen, & Zvi, 2017) includes examples of HR analytics that presented in IT industry.

Time to hire

It used for hiring the candidates for jobs and it takes some days to process the candidates profile and finalize the candidate for the job

Recruitment cost to hire

This system processed and found the cost of recruiting candidates for the organization and list out the cost of recruiting fresher's and experienced candidates

Turnover

This system gathered the details of employee turnover and it suggested further implementations to avoid the labor turnover in the organization

Absenteeism

The absenteeism rate of employees will monitor from this system and it counted the frequency of absents by the employees and it provide those details about the

2.11 HR analytics in organizational performances of IT industry

HR analytics highly contributed in organizational performance and achievements based on employees effective performances towards organizational goals. Similarly, (Mohammed & Quddus, 2019) has stated in their study HR analytics is a major

influential work which has provided the necessary impetus, dimensions and directions for the organization. The study found that additional value for the organization with an effective managerial and organizational decision making – is the most effective contribution of HR analytics.

The (Luftman et al., 2017) study suggests that organizations must follow outside in approach instead of inside out approach. This study presents two case studies on implementation of HR analytics and its impact on organizational outcomes. The study found that HR analytics could provide positive effects on organizational performance and talent recognition. The study concludes that HR analytics could be a major effective tool for creating real time impact on organizational value and performance of companies. As this study had been conducted in 2019, and after that research studies have been conducted very less on this approach and dimensions, this research is attempted for the first time in IT industry involving 2 companies – one IT and one ITES company in Hyderabad. This study would also evaluate and assess the impact of HR analytics in two companies in Hyderabad in real time situations. The study would also provide suitable suggestions, recommendations and conclusions on HR analytics and its impact on IT industry, Hyderabad.

The study (Rathi, R. A 2018) explains with the availability of big data and Internet of Things (I o T), helps the implementation of the Artificial Intelligence practices and concludes that how AI practices reduces the administrative burden of HR. The paper also highlights the advantages and challenges faced by AI implementation in HR.

HR analytics must be made as a standard tool for decision making for leaders and potential leaders in organizations. This would enhance better and effective decision making. (Kim, Dibrell, Kraft, & Marshall, 2021) conducted this study also as a case study method to evaluate the impact of HR analytics in organizations. In this study it was found that HR analytics by nature had a positive effect on organizational performances and outcomes.

As no research study had been conducted as a case study in IT industry Hyderabad, this research is an attempt in this direction. There is a potential biases which occurred in the organizational process for hiring people, performance appraisal, training

procedures, providing employee benefits and motivational factors. This system clearly specifies that the most important dimensions of HR performance, attrition, recruitment and training could be assessed and predictive decision making could be achieved very effectively.

The(Turulja & Bajgoric, 2018) study also has clearly highlighted the process of HR analytics and its role on organizational performance and achievement.

Hiring bias

For a specific job numerous of people will apply and based on their profiles this system will extract the candidates based on their qualification and skill. This process done in the first stage and the second stage it accurately takes the fit candidate for the particular job based on their experience and knowledge in the particular job.

Performance appraisal bias

This system will reduce the performance appraisal bias in the organization. It will record the productivity scores and their performances will be evaluated with the performance appraisal scale in the organization. It is the best system that reduced the employee bias in the organization(Pandey, 2018).

2.12 Improved performance management

(Horton, 2020), HR analytics will improve the organizational performances and also improved the performance management in the industries especially in the IT industries. HR analytics have provided new dimensions of thinking, process and approaches. It has also led to increase in productivity and performances.

HR Analytics with the help of HR metrics helps in tracking and updating the employee performance, such Return of Investment tools helps in comparing the outcomes and can identify the areas where the HR department should concentrate on (Ben-Gal, H. C. 2019).

It has been used as an effective tool to predict employee performances and productivity. HR analytics impacts the organization in so many ways in decision

making, talent recognition and retention, employee management and leadership orientations also. It is a game changer for futuristic organizations. Yet we could find that adoption, usage and its role has to be realized more. In India although we could find applications of business analytics and HR analytics has been considerable, there is a need for more empirical and conceptual based researches on the role of HR analytics in IT industry of Hyderabad. As all these problems and dimensions have not been studied in IT industry of Hyderabad, this research is carried out for the first time in this direction.

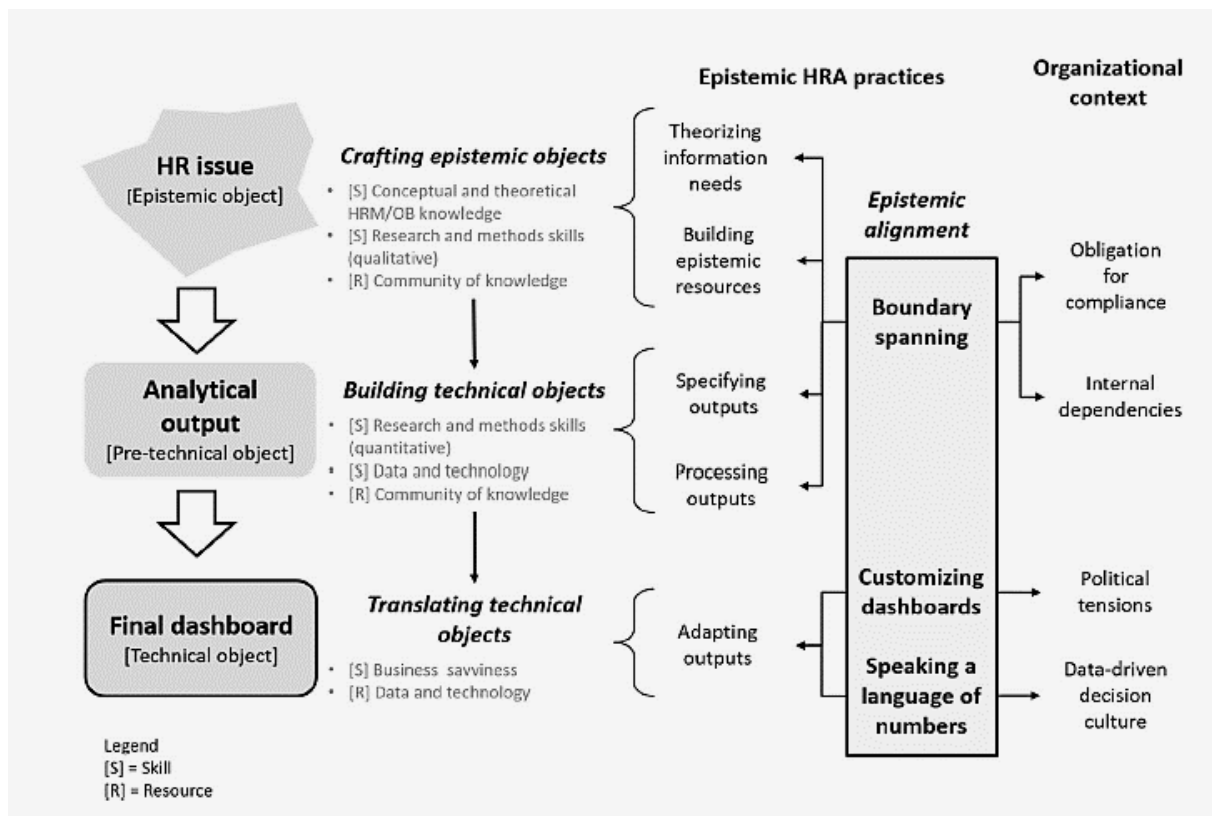
2.13 Employee retention:

The organization has flexible work arrangement (FWA) in the workplace for helping employees and achieving balance among private obligations and work obligations. This (Ugargol & Patrick, 2018) study explores the utilization of FWA in Indian IT industry and EE (employee engagement). The respondents of the study in the organizations of Bangalore, India with 504 participants. Similarly, (Francina, 2021) addresses all related problems on HR practices on IT organization of employee in Hyderabad, India. This study aims to examine the impacts on employee retention. On the three companies namely, TCS, Wipro and Infosys. The result of (Babu) this study also explains about the employee retention where employee needs competitive compensation packages and clarity about reducing turnover intention between employees.

With a view to understand how big data helps in improving employee retention, mixed methodology study identifies keeping big data as a mediating factor and with the help of regression analysis states that the strategic HRM plays a vital role in employee retention (Singh, 2022).

2.14 HRA implementation in IT industry:

Figure 2.3: HRA practices and relevant analytical outputs in organization



Source (Ellmer & Reichel, 2021)

In above figure 2.3, epistemic alignment aligns to make decision of business reality while implementing analytical outputs, as basic mechanism to builds business related HRA practices outputs. Boundary spanning links internal knowledge with external resources of the team was presented and observed HRA practices. By customizing dashboards, the team members adopting analytical outputs along with expressing HR board member, ensures compliance and balance political tensions. The team members mobilize the high quality of data.

The speaking language of numbers, allows the HRA team member to leverage high quality skills and resource for producing complex analytical outputs, at the same time closely staying to the decision makers, immediately solving business problems and accounting organizational conditions such as dependencies, compliance, data driven decision culture and political tensions.

2.14.1 HR analytics dashboards:

(Creelman, 2018) defines, HR dashboards are useful for performing analysis and finding areas for improving an organization. This HR dashboards are not only important to HR managers and also to the C-level HR executives. Decision makers assure strategies of the company had been formatted form executive for managing the individual goals. HR and executives works together to find the data which had to be taken into the action. Then, data collected and monitored to keep performance of workforce which had aligned with organizational objectives. (Coron, 2018) provides concise of a good HR dashboards and shows key performance indicators. Narrow down the measurement of KPIs and builds workforce picture to guide for decision making process. It monitors metrics and benchmarking performance. Note down significant visualizations and drill down as needed. This study intended to measure only meaningful data and also most valuable and actionable data. The aim was to monitor metrics which had been connected to the further course of action. HR requires attaining aggressive deadlines for hiring to enhance the growth of the company. Diving deeper into measuring everything and also nothing. Organization had challenges in each department. Then, determining which relevant to the HR department. Finally, determine metrics which had been providing to insights of these challenges.

David Angrave, (2016) using the secondary sources identifies that HR department is lagging in adopting to new technology like HR Analytics as there is lack of analytical skills, however as the availability of dashboards can be used in assessing and

analyzing the data with the help of HR metrics and can support HR in becoming strategic HR

2.14.2 HR analytics reward function:

(Madhvapathy & Rajesh, 2018) refers that reward function had long traditional various metrics and keeps tracks of them over the time for making decisions. Bench marking analysis, correlation of variables, predictive analysis and scenario modeling are common in rewards system team. Salary survey is the best example where most of the companies assume that investing each year in amounts of data to make competition into the market. This data are analyzed and processed for getting insights for defining and adapting reward system. (Atchyutuni & Kumar, 2018) explains about the reward system analysis, these reward strategies had big impact on organization as it influence business results. These types of analysis help to uncover the correlations and provide focus of reward strategy in correct strategy such as engagement driver analysis, turnover driver analysis, reward analysis, employee benefits analysis. Vicenc Fernandez (2020) through his research informs that HR Analytics helps in improving the performance of the employees and motivates them to implement HR Analytics as it leads to more rewards.

2.14.3 HR analytics easiness in Technology and Software

Lije George(2016) brings out the importance of technology easiness and software in the implementation of HR analytics. using qualitative methodology after conducting interviews with 13 HR professional across different sectors and using UTAUT model identified that the technology easiness and software plays a vital role in implementation of HR Analytics. In contradictory to this Shet, S. V.(2021) through framework synthesis approach identifies 5 factors with 23 sub dimensions that help in implementation of HR Analytics and brings out that easiness in technology and software alone don't help in implementation of HR Analytics, the analytical skills plays a vital role in implementation.

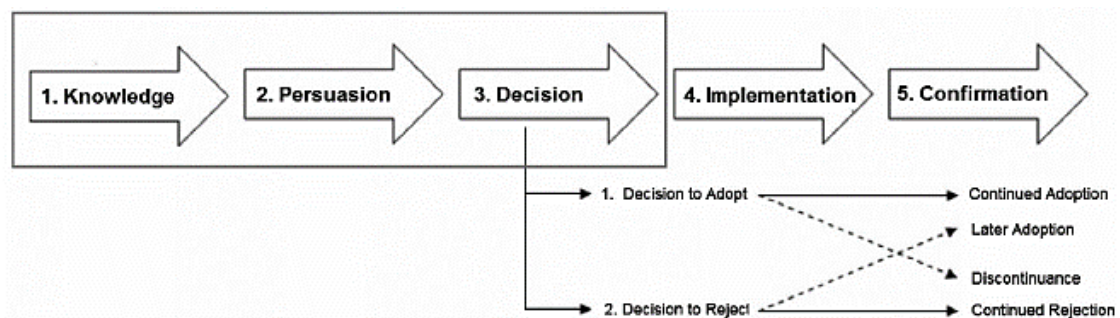
2.14.4 HR analytics Analytical culture

Lije George(2016) identifies that Analytical culture is necessary for implementation of HR analytics, change in the culture is needed (Davenport et al., 2010) supported by top management is necessary for implementation. Kristian Kremer(2018) brings out that implementation of HR analytics is not clear and more research needs to be done. Using exploratory analysis by literature reviews and case study method identified the important moderator factors for HR analytics implementation, though the high end technology eases the implementation of HR analytics, however the high costs, lack of knowledge of HR metrics, analytical capabilities are necessary. It is also necessary for change management process in order to implement HR analytics. Fernandez, V (2020) contradicts with the support of literature reviews from the year 2000 to 2019 from 64 manuscripts and analyzes that the needs of HR is not identified by culture, practices or objectives, rather the qualifications of HR is necessary for implementation of HR analytics.

2.14.5 Enhancing decision making and support for management:

(Vargas, Yurova, Ruppel, Tworoger, & Greenwood, 2018) enhances the decision making by EBDM (Evidence based decision making), the HR analytics supports organizational management to supports HR analytics in IT industry. This study applied TPB (theory of planned behaviour) for examining individual decision support for adopting HR analytics in information technology organization. This measured three stages for individual decision making process.

Figure 2.4: enhancing decision making and supporting management implementing HRA analytics in organization



Source (Vargas et al., 2018).

Form the above figure 2.4 At the first stage knowledge, persuasion, decision are formed then, these decisions are adopted or rejected by HR analytics process while implementing into organization. If decision adopted to continue for implementation and confirmation, some decision adopted but it may rejected by some reasons. If decision are rejected and continued for rejection, some decision are later adopted and further continued to implementation and confirmation.

(Dai, Yoshigoe, & Parsley, 2018) provides cost reduction using ROI (return of investment) while implementing HR analytics in an organization. This ROI reduced costs effectively and efficiently in organization. This study provides an integrative analysis about HR analytics on execution of analytics and process of HR oriented in information technology industry.

Data quality was capable of providing data set for serving in decision making, operations and planning. Data quality testing had been a significant aspects of data analysis. DQ maintain HR contexts which had been related to employee profile, well-being purposes, and personal for regulatory and professionally arranged organizational structure, training, skill sets and development. The high quality of data can enhance the chances of attaining high services in organization.(Dai et al., 2018) identifies different aspects of quality data from the above definition, dimension, strategies, types and techniques are basic for equipping methods and process to improve data. This study also uses technological software such as machine learning (ML) to improve statistical quality models of HR analytics.

2.15 Challenges and barriers of HR analytics:

Table 2.1: Literature support – Challenges and Barriers of HR Analytics

S.no	Authors	Challenges and barriers
1.	(Fernandez & Gallardo-Gallardo, 2020)	• This study approaches different perspectives to identify barriers in HR analytics. • This study grouped these challenges into four categories. • Data and models

		• Software and technology • People • Management • These first three categories are connected to resources required for carrying out the HR analytic process. Whereas fourth one defines actions required for implementing it.
2.	(Maria, 2019)	• This study explains challenges about HR analytics in IT industry in India, especially TCS. • Pay roll can be handled by analysing the basic cause and reduces payroll cost by decreasing manual based process, careful at check bounces etc. • Diverse workforce was managed effectively. The system finds the dynamic features which enhance employee output, attrition causal analysis, boosting up employee morale and trends. • Good talent had been retained. Top most performers are founded related to pay scale, job tenure, past attrition rate and performance rating. • Effective development and training programs are examined. It investigates effectiveness of many external and internal programs and training for dealing with gaps in skills. • This HR system offers to ensure compliance with regional, local, and country towards with special compliance requirements.
3.	(Madhvapaty & Rajesh, 2018)	• This study intended the employee training and analytical skills towards the organization. • Organization concerning the deployment of increasing HR tech, it also faces challenges are: • First challenges related to employee and analytics skills which had been developed for utilizing new technology at workplace. • Organizations requires an important amount of process for

		leveraging the maximum potential. • Second challenge was that the vendors are usually looking on management side more than employee's side.
4.	(Kremer, 2018)	• This work analysing challenges while implementing HR analytics in information technology industry, especially in India. • HR professionals should find organizational issues and ask right questions for quality of data. • Analysing large amount of data initiating to answer wrong questions which damage focuses of employees not being beneficial. • HR analytics need an infrastructure which makes consistent and accurate data over functions and even accessing form external organization. • Information technology requires direction of modern and advanced analytics and looking upon analysis, data exploration and modelling. • The current information technology toll HRIS needed to be upgraded for meeting modern requirement of IT industry. • In order to, perform efficiently HR analytics and HR professionals requires skills for preparing data, to implement statistical analysis and communicating results with understandable and meaningful way.
5.	(Ugargol & Patrick, 2018)	• Cross sectional data not permits to make independent measurement of employee engagement or making causal inferences. • This influence to change employee engagement towards organization
6.	(Babu),2017)	• This study discuss about the challenges faced by IT industry employee on implementation of HR analytics in India.

		• The employee with clarity in role in IT industry are not paid with rewards and payments for satisfaction. • Many employees in IT industry are neutral for turnover intention.
7.	(Parviainen, Tihinen, Kääriäinen, & Teppola, 2017)	• The common challenges and barriers are: • Bringing data together from various places. • Absence and lack of data analytics skills among HR professionals. • Not enough IT resources for HR data analytics. • Difficulty in compliance and privacy. • Picking out “human” for HR.
8	IBM Analytics, Executive Report- Starting the workforce analytics journey- Nigel Guenole, Sheri Feinzig, Jonathan Ferrar and Joanne Allden, IBM Smarter Workforce	• Financial costs is not considered for implementation rather the outcomes of such technology is considered, moreover, the implementation costs are treated as capital expenses which can be written off

Source : Author's Own

The recent 21st century challenges of HR analytics in HR are conflict management, change management, managing 5R's, multi-generational workforce, globalization, workforce diversity, succession planning and striking work life balance.

2.16 Summary:

This chapter focused on the complete review of the proposed study. The reasons for using Human resource analytics in information technology are discussed towards with various authors' perspectives. The information technology tools and software such as artificial intelligence, HRIS are explained in detail by different authors point of view. This chapter assessing the existing HR practices in information technology industry and reasons for using HR analytics. The study also measuring HR analytics in organizational performance and implementation in IT industry. Finally, the study investigates challenges and barriers while using HR analytics in IT industry.

CHAPTER III

RESEARCH METHODOLOGY

In this chapter, objectives of the study, hypothesis framed, research design and methods, reliability and validity of the instrument are studied. In the next chapter qualitative and quantitative analysis has been done.

3.1 Objectives of the study

The objectives of this study are to provide answers to the following questions:

1. To assess the existing HR practices in IT Industry and reasons for using HR Analytics in IT Industry
2. To measure the influence of Human Resource Analytics and the organizational performance in IT industry
3. To explore the factors for the successful implementation of HR Analytics in IT Industry
4. To investigate the challenges and barriers encountered in using HR analytics in the IT industry
5. To prepare the recommendation and give suggestions to IT industry

3.2 Hypothesis – Objective Wise

Objective 1 : To assess the existing HR practices in IT Industry and reasons for using HR Analytics in IT Industry

Hypothesis

Null $H_{01}: \mu \leq 2.5$

There is no significant relationship between identified HR Practices[Data Driven Practices, Artificial Intelligence Practices, Statistical Evaluation Practices, Assessment and Analyze and HRIS] and existing HR Practices IT Industry

Null Hypothesis

- $H_{02} = 0$:There is no significant relationship between HR Practices in IT Industry and AI for Sourcing The Job Applicant, Chat Bots, AI in Tracking The Employee Background , right Decision Making , Revision Of Training Structure & Material , identifying the Attrition Reasons , Work Culture , Employee Participation , Reduced Biasness .

Objective II : To measure the influence of Human Resource Analytics and organizational performance in IT industry

Null $H_{03}: r=0$

[There is no significant association between HR Analytics and Organizational Performance i.e Reduced Costs, Employee Performance, Employee Retention, Effective and Efficient budget planning and Employee Engagement

Objective III: To explore the factors for the successful implementation of HR Analytics in IT Industry

Null Hypothesis

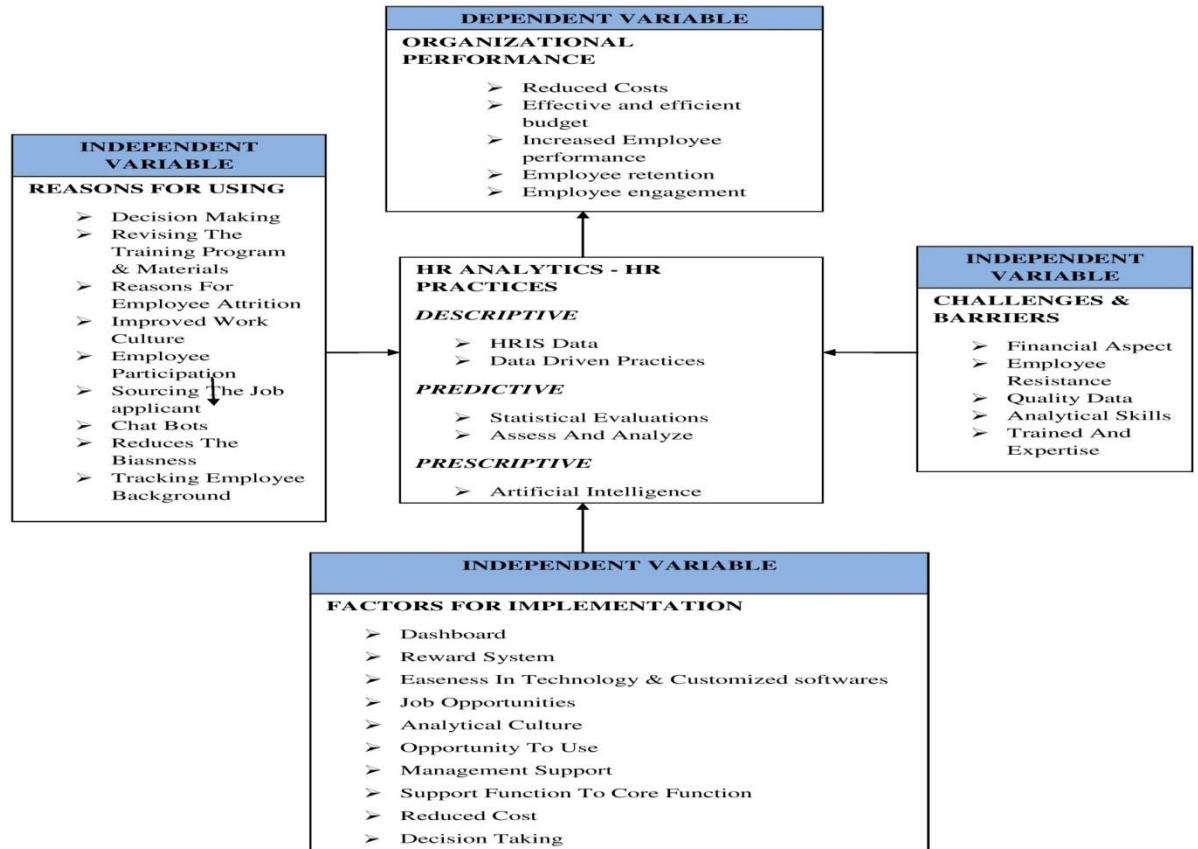
$H_{04} = 0$:There is no significant relationship between HR Analytics implementation and Dashboard, Reward Systems, Easiness In Technology & Customized Software, Job Opportunities, Analytical Culture, Management Support, Quality Data, Enhanced Decision Skills, Opportunity to Use, Reduced Costs Support Function To Core Function

Objective IV: To investigate the challenges and barriers encountered in using HR analytics in the IT industry

Null Hypothesis

- $H_{05} = 0$:There is no significant relationship between HR Analytics in IT Industry and Challenges and Barriers in using i.e Financial Aspect,Employee Resisitance,Quality Data,Analytical Skills, Trained & Expertise

3.3 Overall Research Model



3.4 Research Design

In order to study and analyze systematically, research methodology is a technique. It is a process of obtaining the answers to the questions and may need to handle problems during the study (Polit and Beck 2016).

A research design is based on the overall objectives of the study i.e qualitative, quantitative and mixed methods (Creswell & Creswell, 2017). A good research design has objectivity, validity, reliability and generalizability of the findings.

In the present study, mixed methodology has been used to achieve the objectives. An exploratory sequential design has been used for this research, wherein, qualitative study is conducted and the themes obtained were backed by literature review so as to build high reliability. Such themes were used in construction of quantitative questionnaire.

A Narrative research design was used for qualitative study which helps in attaining the objectives from the knowledge of participant's experiences. Open ended structured questionnaire having 4 questions were asked by conducting one to one interviews with the middle and upper level HR Managers. The interview transcripts were then sent to the participants if their views are correctly transcribed or not to ensure participant's validation and were then analyzed by using NVIVO 11 trail version software. A total of 36 themes were obtained after analyzing the transcripts. The themes are used in preparation of questionnaire. After validity by the experts 4 questions have been added, 1 question is deleted and 3 questions were modified resulting in 39 questions. After the reliability tests 4 questions with low cronbach alpha's value is removed resulting 35 questions. Again the validity and reliability tests were carried out and 1 question has been modified after experts' suggestion. The reliability test using cronbach alpha signified that all the questions were suitable. Hence, the final questionnaire consisted of 35 likert scale questions.

3.5 List of Final Themes Obtained Through Analysis of Qualitative Interviews

Table 3.1: List of Themes obtained from Qualitative Analysis

HR PRACTICES	Data Driven Artificial Intelligence Statistical Evaluations Assess And Analyze HRIS Data
--------------	--

REASONS	Sourcing The Job Applicant Artificial Intelligence Chat Bots Tracking Employee Background Decision Making Revising The Training Program & Materials Identifying Reasons For Employee Attrition Improved Work Culture Employee Participation Reduces The Biasness
ORGANIZATIONAL PERFORMANCE	Reduced Costs Employee Performance Employee Retention Effective And Efficient Budget Employee Engagement
IMPLEMENTATION FACTORS	Dashboards Reward System Easeness In Technology And Customized Softwares Job Opportunities Analytical Culture Management Support Quality Data Decision Taking Skills Excited To Use The Opportunity Reduced Cost Migrating HR Department From Support Function To Core Function

CHALLENGES & BARRIERS	Financial Aspect Employee Resistance Quality Data Analytical Skills Trained And Expertise
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Source: Research Outcome

3.6 Population of the Study

For Qualitative Study:

In the initial stages, it is thought to consider all the HR population of IT companies that are implementing HR Analytics, however, during the interactions with the HR population, as HR Analytics is in infancy stage, it is decided to curtail our study only to experienced HR population. As the study demands expertise in HR field, it is decided to consider only the Middle and Upper Level HR population of CMM Level 5 IT companies in Hyderabad Region. After approaching 22 companies, 16 interviews were conducted with the participants of the target population from 14 companies. The reason for considering IT companies is their easeness in adopting new technology and also considering HR Analytics in infancy stage (Rasmus Hietanen,2022). The qualitative study also helped in knowing the companies that are already using HR Analytics. It was found that all the CMM Level 5 IT companies are adopting HR Analytics.

For Quantitative Study

For the quantitative study also, the middle and upper level HR population of CMM Level 5 IT companies in Hyderabad is considered. The list of CMM Level 5 companies is obtained from <https://cmmiinstitute.com/learning/appraisals/levels> for

the year 2020. Due to anonymity assurance, the personal details of the respondents like email id's, though collected, is not disclosed.

3.7 Sampling Technique

For Qualitative Study:

For the qualitative study, Purposive Random Sampling Technique has been used as the participants should have knowledge of all HR activities so that they can throw insights of the required study.

For Quantitative Study:

For quantitative study, in order to reach the target population i.e Middle Level and Upper Level HR population of CMM Level 5 IT companies, Snowball sampling technique has been used.

3.8 Sampling Size

For Qualitative Study:

The concept of 'saturation point' is very important in qualitative studies. Saturation point can be explained as where there will be no new knowledge or new information can be obtained. Bruce & Johnson mentioned that the saturation point in qualitative research as 12th interview, however, as the interviews are conducted till the saturation point is reached. In the present study, the saturation has been reached by 12th interview; however, keeping the future prospects for the study, the maximum possible interviews i.e 16 interviews were conducted.

For Quantitative Study:

For quantitative analysis, since the middle and upper level HR Managers of CMM Level 5 IT industry population of the study is not known, the initial sample is taken as 385 (Glenn D Isarel.1992) ..

$$n_0 = \frac{Z^2 pq}{e^2} = \frac{(1.96)^2 (.5)(.5)}{(.05)^2} = 385$$

$$n_0 = z^2 pq / e^2 = (1.96)^2 (.5)(.5) / (.05)^2 = 385$$

Where:

n_0 = sample size

z = standard normal deviation set at 95% confidence level

p = percentage picking a choice or response

c = confidence interval for your estimation

3.9 Data Collection

For Qualitative Study:

The data is collected from participants through structured open ended questionnaire. One to One interviews are conducted with questions consisting of the objectives of the study. On an average 30-45 minutes is the time taken for one interview, deducting their calls time attended. For some interviews, there was no option other than to wait for longer hours. All the interviews were first hand written and then transcribed in a computer generated format. Then the same were sent to the participants to check, if their intentions were properly written or not. This is done to ensure respondent validity.

For Quantitative Study

The questionnaire is prepared electronically Google form and then circulated and responses were collected. The questionnaire was divided into two sections: First section consisted of statements related to demographic profile of respondents which includes email, name, organization affiliation and designation in organization; the

Second section contained 35 statements covering all the objectives. Since, for hypothesis testing the commonly used scale is likert scale, we have adopted 5 point likert scale i.e ‘Not at all-1 to ‘To a Very Great Extent -5’ (Intan Osman, 2011)

Expert opinion

The questionnaire was sent to 17 experts from academia holding doctorate degree and experts from industry, their suggestions were duly incorporated

Pilot testing

The pilot study is conducted on 38 respondents, wherein the respondents have to fill in the responses without intervention of the researcher.

3.10 Reliability and Validity of the Instrument

Instrument Reliability

As the data is collected using likert scale, Croan bach is the commonly used test for reliability. The value in Cronbach alpha ranges from 0 to 1. The nearer the value in the Cronbach alpha to 1 indicates the greater reliability of the instrument.

Table 3.2 – Overall Cronbach’s Alpha value

Reliability Statistics	
Cronbach's Alpha	N of Items
.915	35

Source: Research Outcome

From the table 3.1, it is observed that the Cronbach’s alpha value is 0.915 which is more than the desired value

Cronbach Alpha for Factor -1 (HR Practices)

Table 3.3 Cronbach's alpha – HR Practices

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.701	.701	5

Source: Research Outcome

The Table 3.3 , the construct HR Practices has 5 items with the cronbach's alpha > 0.7 , hence reliability is constructed

Cronbach Alpha for Factor -2 (Reasons for using HR Practices)

Table 3.4: Cronbach Alpha for Reasons for using HR Practices

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.708	.708	9

Source: Research Outcome

The Table 3.4 , the construct Reasons for using HR Practices has 9 items with the cronbach's alpha > 0.7 , hence reliability is constructed

Cronbach Alpha for Factor -3 (Organizational Performance)

Table 3.5 Cronbach Alpha- Organizational Performance

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.828	.828	5

Source: Research Outcome

The Table 3.5, the construct Organizational Performance has 5 items with the cronbach's alpha > 0.7 , hence reliability is constructed

Cronbach Alpha for Factor -4 (Implementation Factors)

Table 3.6 Cronbach Alpha- Implementation Factors

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.820	.827	11

Source: Research Outcome

The Table 3.6, the construct Implementation Factors has 11 items with the cronbach's alpha > 0.7 , hence reliability is constructed

Cronbach Alpha for Factor -4 (Challenges & Barriers)

Table 3.7 Cronbach Alpha- Challenges & Barriers

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.796	.797	5

Source: Research Outcome

The Cronbach alpha confirms high internal consistency of the instrument and is reliable.

The Table 3.6 , the construct Implementation Factors has 5 items with the cronbach's alpha > 0.7 , hence reliability is constructed

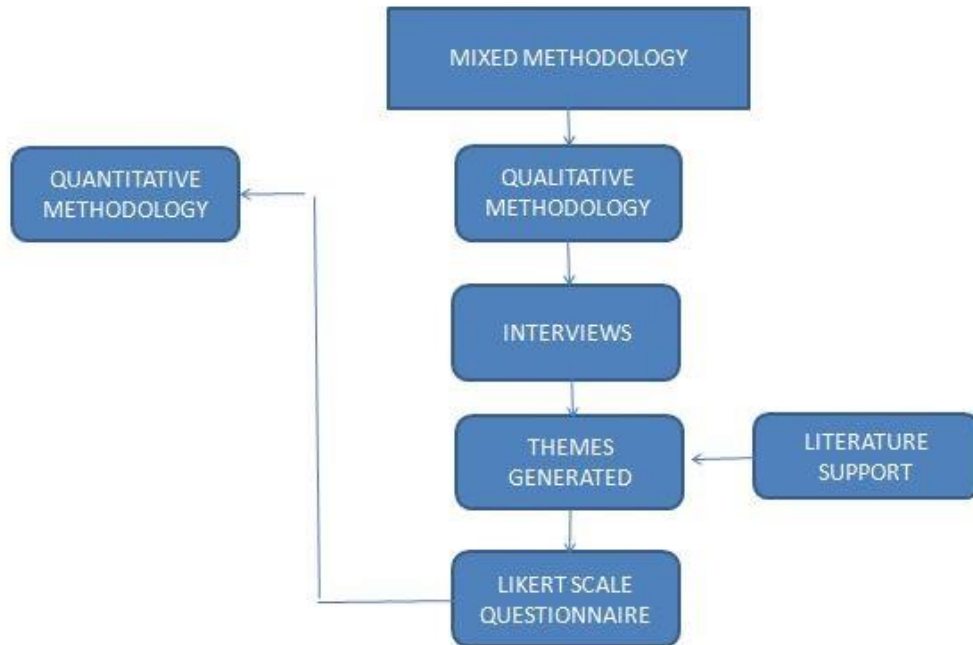
Instrument Validity

Instrument Validity is the measure of instrument what it is needed to measure

- a) Face validity: It knows from the respondents if the questionnaire is complete or not. Also the questionnaire is served to 16 respondents to test if the questionnaire is clear or not.
- b) Content validity: The questionnaire is sent to 16 experts from industry and academia and all the items i.e 35 in the questionnaire are having content Validity index of more than 80% hence the validity is established (Davis LL, 1992)

3.11 Research Methodology – Flow Chart

Figure 3.1 – Research Methodology Flow Chart



Source: Authors Own

3.12 Conclusion

Research Methodology explains the overall research design highlighting the objectives, hypothesis, identified variables of the study, sampling procedures, instrument validity and reliability. The next chapter concentrates on the assumptions of multiple regression, factor analysis, multiple regression analysis

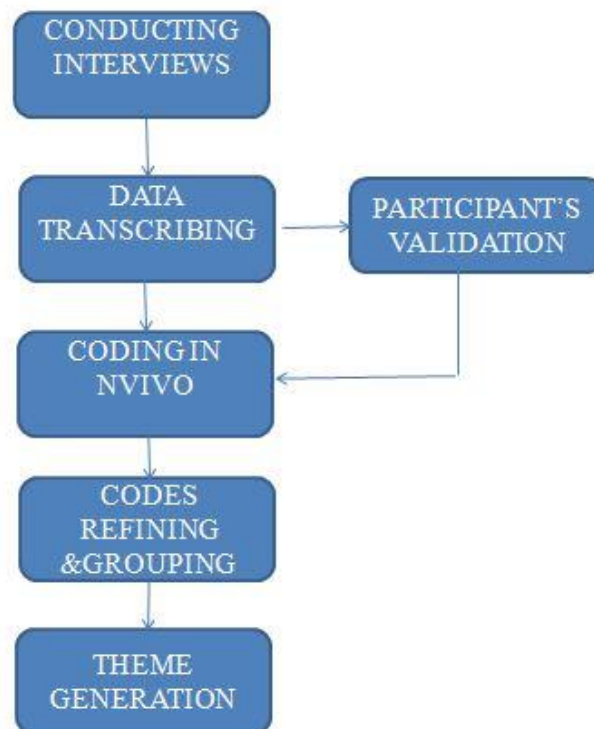
CHAPTER IV

DATA ANALYSIS

4.1 Preview of Chapter

In the previous chapter, discussed about the methodology used for this research. The present chapter aims on data analysis. The interview transcripts were analyzed through qualitative data analysis using thematic analysis by using qualitative software tool NVIVO 11. After validation and reliability tests and subsequent validity and reliability tests a total of 35 themes were identified. Such themes were backed up by literature and such themes were used in the preparation of quantitative questionnaire.

Figure 4.1 – Qualitative Analysis Flow Chart



Source: Research Outcome

4.1.1 Phase I- Analysis of Qualitative Study of the final Themes

4.1.2 Analysis related to HR Practices

Regarding the question related to HR Practices in relation to HR Analytics, the following is the response given by some of the participants

P-15

“In our organization, we follow three types of training need analysis Organizational need analysis -Job need analysis -Person need analysis and this is done by our internal software which is data driven that alerts us regularly the status and what we have to achieve”

P-4

“We give them certain parameters through Artificial Intelligence and they source us the candidates. We are extending HR Analytics to Training & Development and not using much in performance appraisals. Now the limelight is Artificial Intelligence with HR Analytics “

P-6

“The Evaluation in selection process is carried without any discrimination and personal bias”

P-2

“We use it to collect and analyses employee data, performance, behavior and productivity, develop strategy and make decisions”

P-11

“Our selection process is carefully designed where certain key performance factors are identified and then analyzed by some algorithms”

P-14

“It is used to understand employee’s behavior thus reducing employee attrition and placing the right employee at the right place”. “Every year IBM recruits candidates with specific skill set which is defined by the line managers as per their project requirement, then through automation these profiles will be analyzed and selected”.

P-1

“With regard to data we collect everything from age, education, experience, competencies, etc. HR Analytics has made me to look good as it helps in analysis of employee-related data using tools and metrics and in optimizing recruitment investment and identifying the star performers in the company”

P-5

“Once reviewed by HR dept. Assistant (HR) updates the records for each employee’s score in the database”.

Table 4.1 Themes – HR Practices

THEMES	FREQUENCY
Data Driven Practices	2
Artificial Intelligence	7
Statistical Evaluations	8
Assess & Analyze	4
HR Information Systems	3

Source: Research Outcome

After analyzing the transcripts 5 HR Practices which are relevant to HR Analytics have been found

4.1.3 Analysis related to the reasons for using such practices

In response to the question asked regarding the reasons for using such HR Practices, few participants have echoed the following

P-3

“Our job posting gives a glimpse into your company and its culture, and talks about the most important competencies, requirements, and qualifications in order to compel interested applicants to read further and apply”

P-4

“We are using HR Analytics more in selection process rather than recruitment as we depend mainly on consultants who are using Analytical software”.

P-14

“In training and development the training needs are met after understanding the key requirements with the help of Artificial Intelligence and then sourcing the same through internal recruitment”

P-15

“In our organization, we follow three types of training need analysis Organizational need analysis -Job need analysis -Person need analysis and this is done by our internal software like chat bots which alerts us regularly the status and what we have to achieve”

P-8

“HR Analytics helps in smarter recruitment and people management, background checks with tools that explore and analyze an individual’s activity on social media and other sites and forecast their tendency to express toxic behaviors like sexism, sexual harassment, intolerance, or bullying.

We use analytical tools that use machine learning and natural language processing to analyze public online content and internal HR data to spot such red flags”.

P-14

“Our recruitment policies are highly appreciable in way that the candidate is sourced in such a way considering his stability in organizations. These are done purely by analytical software with Artificial Intelligence help which are developed internally”.

P-1

“It helps in decision making and drives company to success in terms of Human resource management”.

P-9

“Analytics allow human resource managers to make informed decisions related to employee lifecycle”

P-5

“Training needs are identified by strategic partnerships with leading technologies by choosing the suitable tool”

P-10

“We use analytics in training for any revisions in training material by with the help of Job descriptions”

P-7

“Training in relevant skills, asking information easily accessible. We generally dependent on software to do our practices at their best”.

P-16

“The training is a routine work based on project requirements in which the material and training structure will be decided by the training department with the help of analytics”

“We are extending HR Analytics to Training & Development and not using much in performance appraisals “

P-12

“Challenges in Forecasting the Recruitment planning, Performance management, Training and development, Compensation management, Attrition and Retention are handled by analytical software ”

P-3

“I am trained in HR Analytics and I was forced to use HR Analytics in the beginning but slowly it has impacted my work style and work culture is improved a lot”

P-2

“we introduce candidates to our company culture to develop a strong employer branding strategy”

P-11

“The engagement levels are increased increasing the productivity of the employees”

P-15

“Improved hiring process, productive workforce, Better Employee Insights helps in employee engagement”.

P-7

“Our practices are selective hiring, fair and performance-based compensation with Artificial Intelligence”

P-1

“HR Analytics helps in reviewing the skillsets of the employees and helps in revising the pay accordingly”

P-9

“HR Analytics brings a positive atmosphere and mindset among employees as it increases the ability of the employees”.

From the above responses, the following are the themes analyzed along with the frequency of occurrences of such themes

Table 4.2 Themes – Reasons for using HR Analytics

THEMES	FREQUENCY
Sourcing The Job Applicant	7
Revising the training structure & material	2
Artificial Intelligence Chat Bots	3
Tracking Employee Background	2
Decision Making	4
Identifying Reasons For Employee Attrition	4
Improved Work Culture	5
Employee Participation	3
Reduces The Biasness	5

Source: Research Outcome

4.1.4 Analysis related to the HR Analytics influence on Organizational Performance

P-3

“Yeah the recruitment costs have come down, the attrition has come down, the costs are saved”

P-4

“HR Analytics reduces the time to perform the task”

P-5

“HR Analytics is underestimated by lot of HR people, it is underutilized , it is used to understand the training needs and selection process only but if can see its ability , there is lot to learn how to reduce attrition or understanding the employee and in long run the costs come down”

P-6

“A system is very important to keep track of all the activities in an organization. Such system collaborated with Analytical software helps in cost reduction”.

P-7

“We can able to compute the business effect of our learning and development spending plan. We can foresee which fresh recruits will turn into your best workers in two years. Or then again that you can foresee which fresh recruits will leave your organization. Having this data will change your recruiting and determination techniques and choices thus reducing cost”.

P-1

“HR Analytics helps in getting real time reports as it ensures update to date dashboard and reports is available for decision making for the management”

P-7

“Money is not the single factor that attracts an employee. New benefits which coax the employees to remain within the organization producing excellent performance. such benefits helps us in reducing the attrition rate thus lowering the costs”.

P-10

“It helps in quick decision making with the help of number of parameters with the help of dashboard and reports obtained as and wherever required. It has elevated the employees performance”.

P-1

“HR Analytics helps in reviewing the skillsets of the employees and helps in revising the pay accordingly. This helps the company in skill development and also in maintaining low attrition rate”

P-3

“The morals are affected by the policies implemented by the company thus lowering the attrition rate”.

P-1

“Budget allocation, budget spread across different departments and budget control are also the key benefits of HR Analytics”

P-14

“Effective and efficient budget allocation is possible through HR analytics thus reducing the costs”.

P-1

“HR Analytics also helps in predicting customer’s next move and to proactively identify his need. This helps in building long term relationship with the customer”

P-3

“HR Analytics proved to be improving performance of employees. The employee feels elevated when they receive appraisals from their superior when the required information for decision making is readily given by the HR department that is mainly because of reports and dashboards”.

P-16

“HR Analytics is used to offer best possible compensation package thus helps employees a feeling of satisfaction leading to increase in employee performance and engagement. It reduces attrition rate and saves costs”.

From the above responses, the following are the identified themes.

Table 4.3 Themes –Organizational Performance

THEMES	FREQUENCY
Reduced Costs	10
Employee Performance	7
Employee Retention	13
Effective And Efficient Budget	8
Employee Engagement	9

Source: Research Outcome

4.1.5 Analysis related to factors for successful implementation of HR Analytics

P-1

“Real time availability of reports and accessibility of dashboards from anywhere in the world helps in quick decision making skills saving time and money”

P-13

Employees expecting Job Enrichment learns to use HR Analytics, the support from the management, training programs undertaken, rewards and support given to trained employees and customized softwares, quality data are important for successful implementation”

P-2

“ Available technology and tools and customization in software .Availability of required data with dashboards anywhere in the world”

P-3

“I have acquired the required skills and it helps me achieving my goals. Every Monday an alert by way of voice mail helps me in prioritizing my works on weekly basis”

P-3

“I have no other choice, there are lots of job opportunities available outside if we are experienced in HR Analytics. Now every company is using HR Analytics. I was trained in HR Analytical software and it simplified my job”.

P-13

“Employees expecting Job Enrichment learns to use HR Analytics, the support from the management, training programs undertaken, rewards and support given to trained employees and customized softwares, quality data are important for successful implementation”

P-3

“I am trained in HR Analytics and I was forced to use HR Analytics in the beginning but slowly it has impacted my work style and work culture is improved a lot”.

P-5

“ Three ‘M’ s are mandatory i.e Money, Mind and Management support. I hope that gave you the answer”

P-16

“Budget, is very important, data and IT infrastructure, employees capabilities, hiring experts, and having a dedicated team who are data and analytics expertise”.

P-1

“Real time availability of reports and accessibility of dashboards from anywhere in the world helps in quick decision making skills saving time and money”.

P-12

Employees ability to take decision based on data driven dashboards also helps in success of HR Analytics implementation”.

P-12

“Ability and willingness of the employees to learn and use analytical software, of course, few employees are willing to use as there are lot of job opportunities. Employees who is trained in technical skills combined with experience in functional areas incline towards HR Analytics. Employees ability to take decision based on data driven dashboards also helps in success of HR Analytics implementation”.

P-16

“Budget, is very important, data and IT infrastructure, employees capabilities, hiring experts, and having a dedicated team who are data and analytics expertise”.

P-3

“I feel HR Analytics reviewed HR function from merely as a support function to a core function. Previously all the functions including performance appraisals were made by their respective project managers and we were there only to approve but now the situation is entirely changed and we were responsible for performance appraisals. The availability of customized softwares enabled us to give reports whenever and wherever required”.

The following are the themes obtained from the analysis of transcripts for the question related to HR Analytics implementation factors

Table 4.1 Themes – Implementation Factors

THEMES	FREQUENCY
Dashboards	8
Reward System	2
Easeness In Technology And Customized Softwares	8
Job Opportunities	5
Analytical Culture	6
Management Support	9
Quality Data	10
Decision Taking Skills	2
Excited To Use The	3

Opportunity	
Reduced Cost	3
Migrating HR Department From Support Function To Core Function	1

Source: Research Outcome

4.1.6 Analysis related to challenges & barriers in using HR Analytics

P-1

“The implementation of HR analytics involves both time and investment which may not be suitable for small organizations with less employees. In this case the cost of investment is relatively more than the benefit derived by using HR analytics software”.

P-2

“Employee does not easily accept the change in process i.e employee resistance. So it is again a challenge”

P-8

“Experienced employees hesitate to bring any modification in the running systems. Availability of right data with proper data monitoring and quality systems”.

P-12

“Data cleaning and using the statistical software require knowledge, hence an experienced employee who has zeal after so much of experience only can learn,

generally, they resist. The dynamic technology implementations also like Artificial intelligence make it even harder and faces employee resistance”

P-1

“There will be resistance from the HR team as it will be very difficult to update the current information in the system. So there is always a gap between actual data and what is available in the system”.

P-13

“Bringing together quality data from many different places and lack of analytical skills are the barriers”

P-3

“The demand for quality data is increased due to HR Analytics and most of the organizations employee freshers to input the data, so there may be some lapses in the data”.

P-2

“Many HR departments lack the statistical and analytical skill set to work with large datasets”

P-16

“HR is often not an analytical expert in the organization, enhancing analysis and data evaluation skills are limited only to few employees only. Getting trained employees and support staff is very difficult”

P-1

“.....management may not be keen to show interest in using the HR analytics and tend to go with the traditional and informal methods for decision making. Enhancing analysis and data evaluation skills may be a professional development focus for some HR professionals. So a dedicated HR team should be trained to handle HR analytics”.

The following are the themes obtained from the analysis for the challenges and barriers in usage of HR Analytics

Table 4.5 Themes – Challenges & Barrier

THEMES	FREQUENCY
Financial Aspect	4
Employee Resistance	12
Quality Data	13
Analytical Skills	10
Trained And Expertise	4

Source: Research Outcome

After identifying the final themes, the themes were supported by available literature as it increases the validity of the research. The transcript was shown to the participant's in order to check if the intentions were correctly written or not. This is known as respondent validation. Such themes were used in the preparation of quantitative questionnaire and after data collection quantitative analysis is carried out.

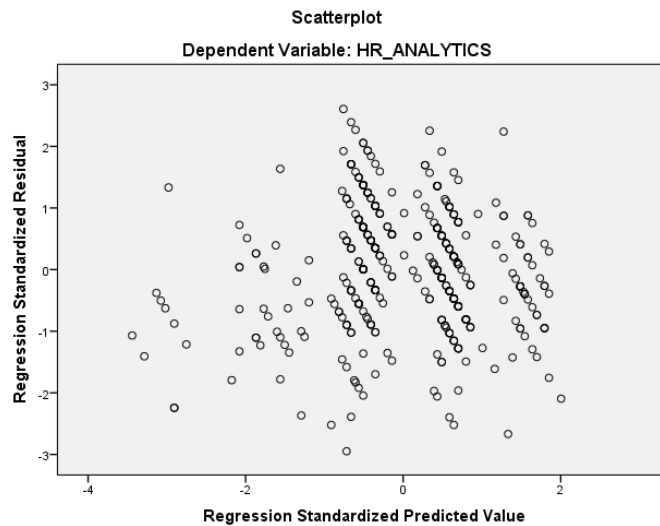
4.2 Phase II- Analysis of Quantitative Study

4.2.1 Test of Assumptions for Multiple Regression Analysis

The following assumptions are required for conducting regression analysis for validity of the model and for making inferences for the target population-

- I. Linearity of the phenomenon measured
- II. Constant variance of the error terms
- III. Independence of the error

Figure 4.2: Linearity, homoscedasticity, constant variance, independence of error

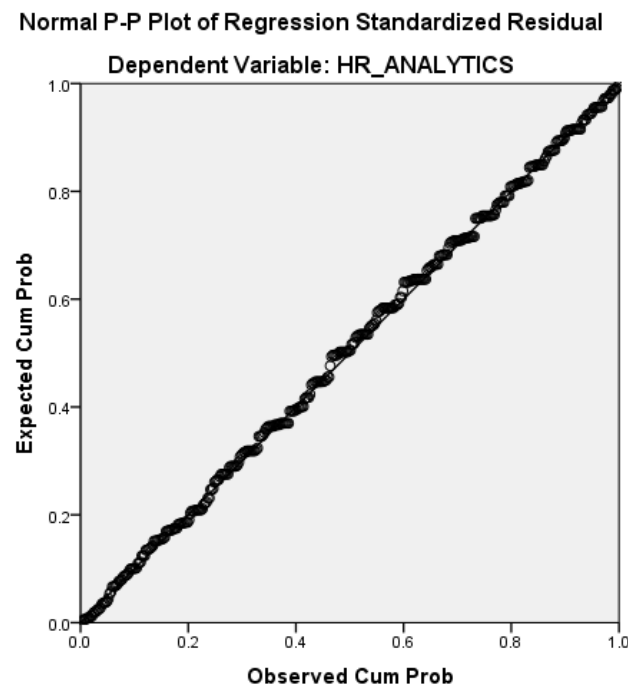


Source: Research Outcome

From the figure That the dots can form a straight line hence, Linerarity is established (Meuleman 2015). The random distribution of dots in the plot proves the assumption of constant variance of error term. If we observe the fitted line vs residual line, they are not forming cone shape hence, homoscedasticity in the model is proven(Das, P. 2019). As the dots are growing larger , Independence of error is satisfied(Osborne, J. W ,2002).

IV. Normality of the error term distribution

Figure 4.3 Test for Normality of Data



Source: Research Outcome

From the above figure 4.3 ,the normal distribution reflects almost a straight diagonal line and the plotted residuals are compared with the diagonal line. As most of the plotted residuals follow the line, the distribution will become normal. As all the points of the observed residuals are on the straight line, hence, the assumption of normally distributed errors has also been met.

4.2.2 Analysis Related to HR Practices

Objective I : To assess the existing HR practices in IT Industry and reasons for using HR Analytics in IT Industry

In order to examine the HR Practices in IT industry the responses were collected with the help of 5 point likert scale with ‘1- Not At All’ to 5’ – To a Very Large Extent’ which is an interval scale . Malhotra and Dash , 2011) a scale in which the objects are rated with the help of numbers to measure the distances to the characters being measured. One Sample T test with test value of 2.5 and significance level at 5% has been used to assess the HR Practices for five dimensions are as below

The hypothesis framed is

Null $H_{01}: \mu \leq 2.5$

There is no relationship between identified and existing HR Practices in IT Industry

Table 4.6 – Assessing HR Practices in IT Industry

HR PRACTICES	t-Value	Sig(1-tailed)	Mean	Mean Difference	Decision	Result
Data Driven	27.501	.000	3.96	1.458	Reject H_0	Significant
Artificial Intelligence	27.372	.000	3.80	1.303	Reject H_0	Significant
Statistical Evaluation	27.271	.000	4.01	1.513	Reject H_0	Significant
Assessment & Analyze	26.507	.000	3.91	1.405	Reject H_0	Significant
HRIS	28.943	.000	4.01	1.511	Reject H_0	Significant

Source: Research Outcome

The Table 4.6 indicates that the p-values of ‘one sample T-test’ are less than 0.05 (at 5% level of significance) i.e $p < 0.000$ for Data Driven Practices, Artificial Intelligence Practices, Statistical Evaluation Practices, Assessment and Analyze and HRIS practices, hence null hypothesis is rejected for these dimensions and can be concluded that these are significant HR Practices in IT industry.

By comparing the p value to the significance level (α) to determine whether to accept or reject the null hypothesis framed. Cooper, Schindler, Sharma (2013) stated that if the value of $p < \alpha$ then reject the null hypothesis and if value of $p > \alpha$ accept the null hypothesis.

Table 4.7 - Ranking of HR Practices

HR PRACTICES (MEAN)	VARIABLE NAME	RANK
4.01	Statistical Evaluation Practices	1
4.01	HRIS Practices	2
3.96	Data Driven Practices	3
3.91	Assessment & Analyze Practices	4
3.80	Artificial Intelligence	5

Source: Research Outcome

From the above Table 4.7, we can also infer that Statistical Evaluation and HRIS practices are mostly used followed by Data Driven , Assessment and Analyze practices and Artificial Intelligence is the least used.

4.2.3 Analysis Related to Reasons for Using Such Practices

Null Hypothesis

- $H_{02} = 0$:There is no significant relationship between HR Practices in IT Industry and AI for Sourcing The Job Applicant, Chat Bots, AI in Tracking The Employee Background , right Decision Making , Revision Of Training Structure & Material , identifying the Attrition Reasons , Work Culture , Employee Participation , Reduced Biasness .

Model Summary

The multiple regression yields a model to predict the reasons for using HR Analytics with the help of HR functions viz., Sourcing The Job Applicant, Chat Bots, Tracking The Employee Background, Decision Making, Revision Of Training Structure & Material ,Identifying Attrition Reasons, Work Culture, Employee Participation, Reduced Biasness. By using SPSS we assessed to what extent the Reasons for using HR Practices are influenced by HR Analytics practices (Alec Levenson,2005), Smruti Patre (2016), Dr. P. Raghunadha Reddy(2017) .

In the multiple regression analysis multiple correlation coefficient (R) is used to know the association between independent and dependent variables, R^2 to measure the variance of dependent variable on independent variable. The value varies between 0 and 1.

Table 4.8 – Model Summary – Reasons For Using HR Analytics

MODEL SUMMARY										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df 1	df 2	Sig. F Change	
	.659	.435	.422	.537	86.397	112.323	9	65	.000	2.299

Source: Research Outcome

From the Model Summary Table 4.8 gives a positive multiple correlation coefficient ($R=0.66$) between all predictors and dependent variables (outcome). The value of adjusted R square ($R^2=.44$) indicates, that 44 % of variance of dependent variable i.e HR Practices is explained by five independent variables in the model. The difference between coefficients of multiple determination ($R^2= 0.435$) and adjusted coefficients of multiple determination (adjusted $R^2 =0.422$) has been found only 0.006. The difference between R^2 and adjusted R^2 indicates the accuracy of model for generalization the results for target population, smaller the difference greater will be accuracy of model. The small value of this difference 0.009 or 0.9% indicates that if the model is derived from the population, it will explain 0.9% less variance in reasons for using such HR Practices in IT industry. The value of Durbin-Watson statistics (2.299) is closer to 2.0 that indicate lack of autocorrelation in the data as a good for model fit (Hair et al., 2011; Field, 2009).

II. Over all Model Fit

The overall fit and testing of hypothesis by degree of variation with the help of regression model is more than the 0 i.e R^2 is significantly greater than zero. The sum of squares with degrees of freedom brings the variance estimation. The upper part of the F ratio signifies the variance which is explained with the help of regression model and lower part of the F ration indicates unexplained variance. The overall fit signifies if the dependent variable is significant or not. One can conclude if the regression model is not only valid for this study but also significant for other models of samples from the population.

Table 4.9 - Over all Model Fit – Reasons for using HR Practices

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	86.397	9	9.60	33.33	.000 ^b
Residual	112.323	390	.288		
Total	198.720	399			

Source: Research Outcome

From the Table 4.9 , F ratio for multiple regression having 5 independent variable is 123.54 with $P < 0.000$ at 5% significance level, hence we can reject the null hypothesis and R^2 is above zero and the variation is more than the base line proving that the model in predicting the reasons for usage of HR Practices in IT Industry.

Table 4.10 Model Summary – Reasons for using HR Practices

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.222	.202		1.101	.271		
	Sourcing The Job Applicant	.189	.032	.241	5.869	.000	.859	1.164
	Chat Bots	.134	.031	.178	4.336	.000	.865	1.156
	Tracking The Employee Background	.005	.032	.006	.150	.881	.816	1.225

Decision Making	.105	.033	.137	3.166	.002	.772	1.296
Revision Of Training Structure & Material	.066	.032	.086	2.073	.039	.844	1.185
Attrition Reasons	.058	.031	.079	1.863	.063	.811	1.232
Work Culture	.134	.031	.180	4.388	.000	.863	1.159
Employee Participation	.050	.034	.061	1.458	.146	.831	1.204
Reduced Biasness	.180	.032	.230	5.697	.000	.892	1.122
a. Dependent Variable: HR_Analytics							

Source: Research Outcome

The model summary table examines the effects of independent variables on dependent variables. The B and Standardized coefficient B identifies the effect of change in dependent variable by changing one unit of change in the independent variables. The standard error helps in identifying the importance how much regression coefficient of each independent variable will vary between the sample sizes taken from the population. The smaller the standard error, prediction is more reliable. The 't' values signifies that at stated level of error the coefficients are not equal to zero. The collinearity statistics having two measures i.e VIF (variance inflation factor) is used to check the multicollinearity among the variables and 'Tolerance' helps in prediction by the other independent variables.

From the above **Table 4.10** , helps in examining and measuring the reasons for using HR Analytics on the basis of Nine independent variables viz., AI for Sourcing The Job Applicant, Chat Bots, AI in Tracking The Employee Background , right Decision Making , Revision Of Training Structure & Material , identifying the Attrition Reasons , Work Culture , Employee Participation , Reduced Biasness is as follows

$$\begin{aligned} \text{Reason for using HR Analytics} = & - 0.222 + .189 (\text{AI for Sourcing The Job Applicant}) + .134 \\ & (\text{Chat Bots}) + 0.005 (\text{AI in Tracking The Employee Background}) + .105 (\text{right Decision} \\ & \text{Making}) + .066 (\text{Revision Of Training Structure \& Material}) + 0.058 (\text{identifying the Attrition} \\ & \text{Reasons}) + 0.134 (\text{Work Culture}) + .050 (\text{Employee Participation}) + .180 (\text{Reduced Biasness}) \end{aligned}$$

From the table 4.10, it is found that the regression coefficients of predictors are positive in nature for all the variables. The different magnitude of regression coefficients reveals the degree to which HR Practices are affected by the reasons. It can be predicted that if, Sourcing The Job Applicant is increased by one unit, the overall reason for usage is increased by 0.189 units, likewise if Chat Bots, AI in Tracking The Employee Background , right Decision Making , Revision Of Training Structure & Material , identifying the Attrition Reasons , Work Culture, Employee Participation, Reduced Biasness is increased by one unit the reasons for using HR Analytics would be increased by .134,.005,0.105,0.66,0.084,0.058,0.134,.050 and 0.180 units respectively. From the Table 4.10 collinearity statistics there is absence of collinearity of data as the average Variance Inflation Factor (VIF=1.19) which is close to 1.0 ; (Field, 2009) The tolerance level values are above 0.1 indicate that the regression model is not biased by the multicollinearity effect.

Table 4.11 t-test Statistics for Determinants of Reasons for using HR Practices

Predictors	Regression Coefficient (B)	Std. Error	t-test statistics (t)	Decision	Result
Sourcing The Job Applicant	.189	.032	$t = 0.189/0.032=5.92$	Reject H0	Significant
Chat Bots	.134	.031	$t = 0.134/0.031=4.32$	Reject H0	Significant
Tracking The Employee Background	.005	.032	$t=0.005/0.032=0.16$	Reject H0	Insignificant
Decision Making	.105	.033	$t=0.105/0.033=3.18$	Reject H0	Significant
Revision Of Training Structure & Material	.066	.032	$t=0.066/0.032=2.06$	Reject H0	Significant
Attrition Reasons	.058	.031	$t=0.058/0.031=1.87$	Reject H0	Insignificant
Work Culture	.134	.031	$t=0.134/0.031=4.32$	Reject H0	Significant
Employee Participation	.050	.034	$t=0.050/0.034=1.47$	Reject H0	Insignificant
Reduced Biasness	.180	.032	$t=0.180/0.032=5.63$	Reject H0	Significant

Source: Research Outcome

It can be seen in the Table 4.11 that Sourcing The Job Applicant ($t= 5.92, p<0.05$), and Reduced Biasness ($t=5.63, p<0.05$), Chat Bots ($t= 4.32, p <0.05$) have greater significant than the Decision Making($t= 3.18, p <0.05$), Work Culture($t= 4.32, p <0.05$) and Revision Of Training Structure & Material ($t= 2.06, p <0.05$), hence we reject the null hypothesis for these dimensions and we accept the null hypothesis for the dimensions i.e Employee Participation($t= 1.47, p >0.05$), Tracking The Employee Background($t= 0.16, p >0.05$), Attrition Reasons($t= 1.87, p >0.05$)

4.2.4 Analysis Related to HR Analytics Influence on Organizational Performance

Objective II : To measure the influence of Human Resource Analytics and organizational performance in IT industry

The hypothesis framed is as under

Null $H_{03}: r= 0$

[There is no significant association between HR Analytics and Organizational Performance i.e Reduced Costs, Employee Performance, Employee Retention, Effective and Efficient budget planning and Employee Engagement

Table 4.12 Assessing the association between using HR Analytics and Organizational Performance

Correlations							
Dimensions		HR_Analytics	Reduced Costs	Employee Performance	Employee Retention	Effective and Efficient budget planning	Employee Engagement
HR_Analytics	Pearson Correlation	1					
Reduced Costs	Pearson Correlation	.615**	1				
Employee Performance	Pearson Correlation	.627**	.482**	1			
Employee Retention	Pearson Correlation	.587**	.556**	.529**	1		
Effective and Efficient budget planning	Pearson Correlation	.553**	.524**	.602**	.553**	1	

Employee Engagement	Pearson Correlation	.483**	.491**	.437**	.566**	.494**	1
**. Correlation is significant at the 0.01 level (2-tailed).							

Source: Research Outcome

From the Table 4.12 , we can infer that all the Pearson's correlation coefficients (r) are significant at 1% level of significance and there exists a high positive correlation between HR Analytics and Reduced Costs($r = 0.615; p < 0.000$), Employee Performance($r = 0.627; p < 0.000$), Employee Retention($r = 0.587; p < 0.000$), Effective and Efficient Budget Planning($r = 0.553; p < 0.000$) and Employee Engagement ($r = 0.483; p < 0.000$), hence we reject the null hypothesis for all the dimensions as association of p values and correlation coefficients are less than 0.05 (5 % level of significance).

4.2.5 Analysis Related to Factors for Successful Implementation of HR Analytics

Objective III: To explore the factors for the successful implementation of HR Analytics in IT Industry

Null Hypothesis

$H_{04} = 0$:There is no significant relationship between HR Analytics implementation and Dashboard, Reward Systems, Easiness In Technology & Customized Software, Job Opportunities, Analytical Culture, Management Support, Quality Data, Enhanced Decision Skills, Opportunity to Use, Reduced Costs Support Function To Core Function

Table 4.13 – Assessing the relationship between HR Analytics and Implementation Factors

Correlations													
	HR_Analytics	Dashboard	Reward Systems	Easiness In Technology & Customized Software	Job Opportunities	Analytical Culture	Management Support	Quality Data	Enhanced Decision Skills	Opportunity to Use	Reduced Costs	Support Function To Core Function	
HR_Analytics		1											
Dashboard													
Reward Systems													

Easi ness In Tech nolo gy & Cust omiz ed Soft ware		.496* *	.45 2**	.479 **	1								
Job Opp ortun ities		.522* *	.40 2**	.539 **	.341 **	1							
Anal ytica l Cult ure		.520* *	.40 2**	.416 **	.458 **	.338 **	1						
Man agem ent Supp ort		.551* *	.42 2**	.528 **	.403 **	.561 **	.381 **	1					
Qual ity Data		.528* *	.41 2**	.415 **	.462 **	.340 **	.997 **	.391 **	1				

Enhanced Decision Skills		.254*	.081	.083	.077	.144**	.138**	.158**	.137**	1			
Opportunity to Use		.245*	.137**	.155**	.164**	.169**	.101*	.158**	.101*	.344**	1		
Reduced Costs		.128*	.100*	.110*	.089	.121*	.070	.028	.080	.199**	.355**	1	
Support Function To Core Function		.517*	.447**	.466**	.984**	.328**	.472**	.397**	.473**	.072	.156**	.069	1
**. Correlation is significant at the 0.01 level (2-tailed).													

Source: Research Outcome

From the Table 4.13 , we can infer that all the Pearson's correlation coefficients (r) are significant at 1% level of significance and there exists a high positive correlation between HR Analytics and Implementation Factors i.e Management Support (r

=0.551;p<0.000), Quality Data (r=0.528;p<0.000), Job Opportunities (r=0.522;p<0.000), Analytical Culture (r=0.520; p<0.000), Support Function To Core Function (r=0.517;p<0.000), Easiness In Technology & Customized Software (r=0.496;p<0.000) Reward Systems (r=0.451;p<0.000) Dashboard (r=0.454;p<0.000) Enhanced Decision Skills (r=0.254;p<0.000), Opportunity to Use (r=0.245;p<0.000), and Reduced Costs (r=0.128; p<0.000), hence we reject the null hypothesis for all the dimensions as association of p values and correlation coefficients are less than 0.05 (5 % level of significance).

Model Summary

The multiple regression yields a model to predict the factors that are helpful in implementation of HR Analytics i.e Dashboard, Reward Systems, Easiness In Technology & Customized Software, Job Opportunities, Analytical Culture, Management Support, Quality Data, Enhanced Decision Skills, Opportunity to Use, Reduced Costs Support Function To Core Function

In the multiple regression analysis multiple correlation coefficient (R) is used to know the association between independent and dependent variables, R^2 to measure the variance of dependent variable on independent variable. The value varies between 0 and 1.

Table 4.14 – Model Summary – Implementation Factors

MODEL SUMMARY										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df 1	df 2	Sig. F Change	
1	.741	.549	.536	.510		122.878	11	101	.000	1.613

Source: Research Outcome

From the Model Summary Table 4.14 gives a strong positive multiple correlation coefficient ($R=0.74$) between all predictors and dependent variables (outcome). The value of adjusted R square ($R^2 = .549$) indicates, that 55 % of variance of dependent variable i.e HR Analytics implementation is explained by eleven independent variables in the model. The difference between coefficients of multiple determination ($R^2= 0.549$) and adjusted coefficients of multiple determination (adjusted $R^2 =0.536$) has been found only 0.006. The difference between R^2 and adjusted R^2 indicates the accuracy of model for generalization the results for target population, smaller the difference greater will be accuracy of model. The small value of this difference 0.011 indicates that if the model is derived from the population, it will explain 0.011% less variance in HR Analytics implementation factors . The value of Durbin-Watson statistics (1.613) is closer to 2.0 that indicate lack of autocorrelation in the data as a good for model fit (Hair et al., 2011; Field, 2009).

II. Over all Model Fit For Implementation factors for HR Analytics

The overall fit and testing of hypothesis by degree of variation with the help of regression model is more than the 0 i.e R^2 is significantly greater than zero. The sum of squares with degrees of freedom brings the variance estimation. The upper part of the F ratio signifies the variance which is explained with the help of regression model and lower part of the F ration indicates unexplained variance. The overall fit signifies if the dependent variable is significant or not. One can conclude if the regression model is not only valid for this study but also significant for other models of samples from the population.

Table 4.15 Over all Model Fit- Implementation factors for HR Analytics

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	122.878	9	11.171	42.934	.000 ^b
Residual	100.958	388	.260		
Total	222.830	399			

Source: Research Outcome

From the Table 4.15, F ratio for multiple regression having 11 independent variable is 42.934 with $P < 0.000$ at 5% significance level, hence we can reject the null hypothesis and R^2 is above zero and the variation is more than the base line proving that the model in predicting implementation factors for HR Analytics

Table 4.16 Model Summary -Implementation factors for HR Analytics

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.463	.185		2.511	.012
	Dashboard	.070	.031	.096	2.297	.022
	Reward Systems	.023	.035	.030	.658	.511
	Easiness In Technology & Customized Software	-.634	.154	-.810	-4.128	.000
	Job Opportunities	.171	.037	.209	4.667	.000
	Analytical Culture	-.948	.382	-1.188	-2.481	.014
	Management Support	.167	.038	.205	4.437	.000
	Quality Data	1.092	.382	1.372	2.856	.005
	Enhanced Decision Skills	.083	.029	.104	2.823	.005
	Opportunity to Use	.064	.025	.099	2.557	.011
	Reduced Costs	-.004	.026	-.006	-.157	.875
	Support Function To Core Function	.780	.154	.991	5.070	.000
a. Dependent Variable: HR_Implementation						

Source: Research Outcome

From the above Table 4.16, helps in examining and measuring the factors for implementation of HR Analytics on the basis of Eleven independent variables viz., Dashboard, Reward Systems, Easiness In Technology & Customized Software, Job Opportunities, Analytical Culture, Management Support, Quality Data, Enhanced Decision Skills, Opportunity to Use, Reduced Costs, Support Function To Core Function is as follows

HR Analytics Implementation Factors = - 0.463 + 0.70 (Dashboard) + 0.023(Reward Systems) - .634 Easiness In Technology & Customized Software) +.171(Job Opportunities) -.948 (Analytical Culture) +0.167(Management Support) +1.092 (Quality Data) +.083(Enhanced Decision Skills) +.064(Opportunity to Use)-.004(Reduced Costs)+.780(Support Function To Core Function)

From the table 4.16 it is found that the regression coefficients of predictors are positive in nature Except for Easiness In Technology & Customized Software, Analytical Culture, Reduced Costs. The different magnitude of regression coefficients reveals the degree to which HR Analytics implementation is affected by these factors. It can be predicted that the factor for implementation i.e Dashboard is increased by one unit, the overall HR Analytics implementation factors is increased by 0.70 units, likewise if Reward Systems, Job Opportunities, Management Support, Quality Data, Enhanced Decision Skills, Opportunity to Use, Support Function To Core Function will increase by .023,.171,.167,1.092,.083,.064,.780 respectively.

Table 4.17 - T-test Statistics for Determinants Implementation Factors

Predictors	Regression Coefficient (B)	Std. Error	t-test statistics (t)	Decision	Result
Dashboard	.070	.031	$t = .070/.031 = 2.25^*$	Reject H0	Significant
Reward Systems	.023	.035	$t = .023/.035 = 0.66^*$	Reject H0	Significant
Easiness In Technology & Customized Software	-.634	.154	$T = -.634/.154 = -4.12$	Accept H0	Insignificant
Job Opportunities	.171	.037	$T = .171/.037 = 4.62^*$	Reject H0	Significant
Analytical Culture	-.948	.382	$T = -.948/.382 = -2.48$	Accept H0	Insignificant
Management Support	.167	.038	$T = .167/.038 = 4.39^*$	Reject H0	Significant
Quality Data	1.092	.382	$T = 1.092/.382 = 2.86^*$	Reject H0	Significant
Enhanced Decision Skills	.083	.029	$T = .083/.029 = 2.86^*$	Reject H0	Significant
Opportunity to Use	.064	.025	$T = .064/.025 = 2.56^*$	Reject H0	Significant
Reduced Costs	-.004	.026	$T = -.004/.026 = -1.54$	Accept H0	Insignificant
Support Function To Core Function	.780	.154	$T = .780/.154 = 5.06^*$	Reject H0	Significant

* - Significant at 5% level of significance

Source: Research Outcome

From the Table 4.17, we can confirm that transforming HR from Support Function To Core Function($t=5.06, p<0.005$), Job Opportunities($t=4.62, p<0.005$) Management Support($t=4.39, p<0.005$), Quality Data($t=2.86, p<0.005$) , Enhanced Decision Skills($t=2.86, p<0.005$), Opportunity to Use (t=2.56, $p<0.005$), Dashboard($t=2.25, p<0.005$), Reward Systems (t=0.66, $p<0.005$) are the significant factors for implementation of HR Analytics in IT industry. Hence we can reject the null hypothesis for these factors whereas we accept the null hypothesis for the factors i.e Easiness In Technology & Customized Software($t=-4.12, p >0.005$), Analytical Culture($t= -2.48, p>0.005$), Reduced Costs($t=.004, p>0.005$) as they are insignificantly effecting the HR Analytics implementation in IT Industry.

4.2.6 Analysis related to Challenges & Barriers in using HR Analytics

Objective IV: To investigate the challenges and barriers encountered in using HR analytics in the IT industry

Null Hypothesis

- $H_{05} = 0$:There is no significant relationship between HR Analytics in IT Industry and Challenges and Barriers in using i.e Financial Aspect, Employee Resisitance, Quality Data, Analytical Skills, Trained & Expertise

Table 4.18 – Model Summary – Challenges & Barriers

MODEL SUMMARY										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df 1	df 2	Sig. F Change	
	.647	.419	.397	.677	43.199	59.964	5	131	.000	2.265

Source: Research Outcome

From the Model Summary Table 4.18 gives a moderate positive multiple correlation coefficient ($R=0.65$) between all predictors and dependent variables (outcome). The value of adjusted R square ($R^2 = .42$) indicates, that 42 % of variance of dependent variable i.e HR Practices is explained by five independent variables in the model. The difference between coefficients of multiple determination ($R^2= 0.419$) and adjusted coefficients of multiple determination (adjusted $R^2 =0.397$) has been found only 0.22. The difference between R^2 and adjusted R^2 indicates the accuracy of model for generalization the results for target population, smaller the difference greater will be accuracy of model. The small value of this difference 22% indicates that if the model is derived from the population, it will explain 22% less variance in reasons for using

such HR Practices in IT industry. The value of Durbin-Watson statistics (2.265) is closer to 2.0 that indicate lack of autocorrelation in the data as a good for model fit (Hair et al., 2011; Field, 2009).

II. Over all Model Fit

The overall fit and testing of hypothesis by degree of variation with the help of regression model is more than the 0 i.e R^2 is significantly greater than zero. The sum of squares with degrees of freedom brings the variance estimation. The upper part of the F ratio signifies the variance which is explained with the help of regression model and lower part of the F ration indicates unexplained variance. The overall fit signifies if the dependent variable is significant or not. One can conclude if the regression model is not only valid for this study but also significant for other models of samples from the population.

Table 4.19 Over all Model Fit- Challenges & Barriers

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.199	5	8.640	18.875	.000 ^b
	Residual	59.964	131	.458		
	Total	103.163	136			
a. Dependent Variable: HR_PRACTICES						

Source: Research Outcome

From the Table 4.19 , F ratio for multiple regression having 5 independent variable is 18.875 with $P < 0.000$ at 5% significance level, hence we can reject the null hypothesis and R^2 is above zero and the variation is more than the base line proving that the model in predicting the reasons for usage of HR Practices in IT Industry.

Table 4.20 Model Summary -Challenges & Barriers in using HR Analytics

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.310	.388		.799	.426		
	Financial Aspect	.047	.066	.048	.708	.481	.976	1.024
	Employee Resistance	.182	.065	.205	2.812	.006	.834	1.199
	Quality Data	.136	.060	.160	2.281	.024	.900	1.111
	Analytical Skills	.169	.063	.188	2.690	.008	.910	1.099
	Trained & Expertise	.357	.063	.407	5.677	.000	.865	1.156
a. Dependent Variable: HR Analytics								

Source: Research Outcome

From the above **Table 4.20** , helps in examining and measuring challenges & Barriers in using HR Analytics on the basis of five variables viz., Financial Aspect, Employee Resistance, Quality Data, Analytical Skills, Trained & Expertise

Challenges& Barriers in using HR Analytics = .310 + .047 (Financial Aspect) + .182 (Employee Resistance)+ 0.136 Quality Data) +.169(Analytical Skills) +.357 (Trained & Expertise)

From the table 4.20 it is found that the regression coefficients of predictors are positive in nature for all the variables. The different magnitude of regression coefficients reveals the degree to which HR Analytics use are affected by the challenges and barriers. It can be predicted that if, Financial Aspect is increased by one unit, the overall challenges and barriers is increased by 0.047 units, likewise if Employee Resistance, Quality Data, Analytical Skills, Trained & Expertise is increased by one unit the reasons for using HR Analytics would be increased by .182,.136,.169, .357 units respectively.

Table 4.21 T-test Statistics for Determinants of Challenges and Barriers

Predictors	Regression Coefficient (B)	Std. Error	t-test statistics (t)	Decision	Result
Financial Aspect	.047	.066	$t = 0.047/0.066 = 0.712$	Accept H ₀	Insignificant
Employee Resistance	.182	.065	$t = 0.182/0.065 = 2.80$	Reject H ₀	Significant
Quality Data	.136	.060	$T = 0.136/0.060 = 2.27$	Reject H ₀	Significant
Analytical Skills	.169	.063	$T = 0.169/0.063 = 2.68$	Reject H ₀	Significant
Trained & Expertise	.357	.063	$T = 0.357/0.063 = 5.67$	Reject H ₀	Significant

Source: Research Outcome

It can be seen in the Table 4.21 that Trained & Expertise ($t= 5.67$, $p<0.05$), and Employee Resistance ($t=2.80$, $p<0.05$), Analytical Skills ($t= 2.68$, $p <0.05$) have greater significant than the Quality Data ($t= 2.27$, $p <0.05$), hence we reject the null hypothesis for these dimensions and we accept the null hypothesis for the dimension i.e Financial Aspect ($t= 1.712$, $p >0.05$).

From the Table 4.20 collinearity statistics there is absence of collinearity of data as the average Variance Inflation Factor ($VIF=1.11$) which is close to 1.0 ; (Field, 2009) The tolerance level values are above 0.1 indicate that the regression model is not biased by the multi collinearity effect.

4.3 Recommendations and Suggestions on Implementation of HR Analytics In IT Industry

Objective V: To give recommendations and suggestions on implementation of HR Analytics in IT Industry

From the overall study , we can understand from Table 1.1 that the Artificial Intelligence is not highly integrated with HR Analytics , which infers that the IT companies are unable to utilize the Prescriptive Analytics.(Katerina Lepeniotia 2020), Prescriptive Analytics helps in choosing the best alternative course of action however, to overcome the problems identified in Table 1.2 i.e Tracking The Employee Background, Attrition reasons and Employee participation which are important aspects of HR can be resolved only if the companies move to prescriptive Analytics. Hence, it is suggested for companies to concentrate on moving to prescriptive analytics. Thus moving to prescriptive analytics helps in overcoming the problems in tracking the employee background, knowing the attrition reasons and improving the employee participation (Fox, A. U. ,2022).

From the Table 2.1 one can understand that the organization performance has linear relationship with the implementation of HR Analytics. (Marler, J. H., & Boudreau, J. W. ,2017) pointed that there is evidence that HR Analytics influences Organizational Performance Hence, there is need for middle and upper level HR to show with evidence how HR Analytics can help in improving organizational performance(Kaur, R) and should convince the topmost management in implementing HR Analytics at all levels (Lai et al ,2017). There is need for organizations to allot sufficient time to achieve their business objectives with the help of HR Analytics (Dubey et al., 2019; Gupta & George, 2016). Further, HR process and HR Analytics must be integrated to confirm the value addition to the outcome of process and deliverables (Minbaeva, 2018)

From the Table 3.5 we can interpret that the HR population is interested to implement HR Analytics as it elevates the importance of HR to management, however there is need to improve the analytical culture among HR employees at all levels which improves the quality data. The importance of data should be explained at lower level

HR employees as it plays a vital role in decision making (Sharma et al, 2022). Further the integration of Artificial Intelligence with HR Analytics will increase the data quality (Strohmeier et al, 2022). The Technology with integration of cloud based (Marler & Boudreau, 2017) may be looked upon to increase the data quality (Angrave et al., 2016), data connectivity with quality data sharing(Gunasekaran et al., 2016; Wamba et al., 2017) helps in overcoming the barriers related to data.

To overcome the barriers of HR Analytics, there is need for HR professionals to have knowledge of research techniques and statistical tools, hence training may be helpful in overcoming this barrier(Janssen et al., 2017; McAbee et al., 2017)

There is need for the department to give importance to framing of HR policies as HR Analytics demands for lot of employee's data which includes personal sensitive information about the employees. So there is need to frame policies in order to be in compliance with various laws. The statutory authorities should mandate ethical boundaries while collecting the employee's data before taking employee's consent (Gurusinghe, R. N, 2021).

There is also need for the top HR to concentrate on identifying the key parameters that are required for evaluation of an employee. For example, for performance appraisal there requires a set of certain key parameters and for training need analysis may require a separate set of parameters (Momin, W. Y. M., & Mishra, K. 2015). The HR should understand that these parameters may differ from industry to industry.

The ultimate aim of any company is to increase the engagement levels in the organization. The engagement levels, either directly or indirectly depends on the satisfaction level of employees. Employees are satisfied if they feel that the decisions taken are unbiased especially during performance appraisals (Simbeck, K, 2019). However, these unbiased decisions are only possible if the data used for decision-making is proper. The unbiased data is only possible if it is extracted using some algorithms or with the help of Artificial Intelligence (Langer, M 2022). Hence, it

should be given top priority in identifying the right tool for such data extraction without human intervention.

There is need to involve only HR employees for data feeding into the system which later will be used for decision making as only HR employees can understand the importance of the data that are being used as input or there requires the HR department to train the employees who are feeding the data.

To understand the problems and to improve the implementation of HR Analytics , it is suggested to improve the policy of Job Rotation, knowledge sharing(Gurusinghe, R. N, 2021),where in the middle level HR have to occupy such positions where the problems exists, so that it will help in overcoming the problems of implementing HR Analytics. Further in order to overcome the barriers incentive based training on new technology and analytical skills are necessary. The companies should identify and appoint the external expertise as consultants.

CHAPTER V

SUMMARY AND CONCLUSIONS

This chapter deals with the summary, major findings, conclusions of the study, managerial implications, limitations and suggestions for further research

5.1 Summary

As the research topic HR Analytics is in infancy stage, the research focuses on the HR practices that evolved after implementation of HR Analytics in IT industry and reasons for using such practices. Besides the easiness, it is also important to understand how HR Analytics influences the organizational performance. The third construct focuses on the factors that were helpful in implementation of HR Analytics. The fourth construct concentrates on the challenges and barriers in using HR Analytics. Main importantly the study emphasizes on giving suggestions and recommendations on how to implement the HR Analytics and what areas the HR should concentrate. Accordingly the following objectives were framed

The objectives of this study are to provide answers to the following questions:

1. To assess the existing HR practices in IT Industry and reasons for using HR Analytics in IT Industry
2. To measure the influence of Human Resource Analytics and the organizational performance in IT industry
3. To explore the factors for the successful implementation of HR Analytics in IT Industry
4. To investigate the challenges and barriers encountered in using HR analytics in the IT industry
5. To prepare the recommendation and give suggestions to IT industry

In order to achieve the objectives, the study uses mixed methodology approach , exploratory sequential design to be precise. The reason for selecting the methodology is to ensure the insights from the experiences of middle and upper level HR Managers and considering the infancy stage of HR Analytics, purpose random technique is used and the qualitative study has been done by conducting 16 interviews and the analysis was done using NVIVO 11 software with the purpose of obtaining the themes for four objectives. After obtaining the themes , a quantitative methodology is choosen to test the hypothesis framed based on the themes obtained from the qualitative study. A quantitative questionnaire has been prepared. Snow ball sampling technique is used for collecting the quantitative responses. The sample size for this study is 385 which is decided on the reference of Glenn D Isarel.1992 for calculating unknown population size. For both the methodologies the target sample is choosen are middle and upper level HR as the study demands the knowledge on different perspectives of HR Analytics.

5.2 Major Findings-Qualitative Research

The following are the themes obtained from qualitative analysis

HR PRACTICES	Data Driven Artificial Intelligence Statistical Evaluations Assess And Analyze HRIS Data
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REASONS	Sourcing The Job Applicant Artificial Intelligence Chat Bots Tracking Employee Background Decision Making Revising The Training Program & Materials Identifying Reasons For Employee Attrition Improved Work Culture Employee Participation Reduces The Biasness
ORGANIZATIONAL PERFORMANCE	Reduced Costs Employee Performance Employee Retention Effective And Efficient Budget Employee Engagement
IMPLEMENTATION FACTORS	Dashboards Reward System Easeness In Technology And Customized Softwares Job Opportunities Analytical Culture Management Support Quality Data Decision Taking Skills Excited To Use The Opportunity Reduced Cost Migrating HR Department From Support Function To Core Function

CHALLENGES & BARRIERS	Financial Aspect Employee Resistance Quality Data Analytical Skills Trained And Expertise
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5.3 MAJOR FINDINGS FROM QUANTITATIVE ANALYSIS

Findings related to HR Practices

By using the Mean values in descriptive statistics , it is found that statistical evaluation practices and HRIS practices are mostly used with a mean value of 4.01, Data Driven practices with a mean of 3.96 occupies the next place followed by Assessment and Analyze practices with a mean of 3.91 and the Artificial Intelligence practices occupies the last place.

The main reasons for using practices like statistical evaluation and HRIS practices are due to concentration of HR Analytics as an ROI(Return on Investment) tool (Ben-Gal, H. C. , 2019). HRIS helps in obtaining the data required to perform statistical evaluations.

Artificial Intelligence practices were least used , the reason being HR Analytics is still in the infancy stage(Andersen, M. K. ,2017) and the companies are still trying to evaluate the technology that integrates with HR Analytics(Jain, P, 2020) and also it is found that the companies are in need of transforming the employees by giving training on HR Analytics and Artificial Intelligence (Arora, M. 2021)

From this we can assume that the Descriptive and Predictive analytics are being used to a greater extent than the Prescriptive Analytics(Katerina Lepeniotia ,2020).

Findings related to the reasons for using such HR Practices

In order to evaluate the reasons for using HR Practices, the multiple regression analysis is used. The overall goodness of fit and predicts the dependent variable. The p value is 0.00 which is less than 0.05 indicates the regression model significantly predicts the outcome variable. The following is the hypothesis framed

Null Hypothesis

- $H_{01} = 0$:There is no significant relationship between HR Practices in IT Industry and AI for Sourcing The Job Applicant, Chat Bots, AI in Tracking The Employee Background , right Decision Making , Revision Of Training Structure & Material , identifying the Attrition Reasons , Work Culture , Employee Participation , Reduced Biasness .

The model summary of multiple regression analysis summarized the following.

The reasons for using HR Practices in IT industry is for Sourcing the Job Applicant(Yawalkar, 2019), availability of chat bots (Egorov, E. E.2019), helps in decision making (Mohammed, D., & Quddus, A. 2019) , helps in revising the training structure and material (Rasmussen, T., & Ulrich, D. 2015) , improved work culture (Sharma, A., & Sharma, T. 2017) and reduced biasness (Rafique, M 2021). However, the value of $p > 0.05$ which tells us that they are not the reasons for using such practices i.e , Tracking The Employee Background (Chatterjee, S. 2021), to understand the attrition reasons (Jain, R., & Nayyar, A. ,2018) and employee participation(Davenport et al., 2010,Khan, S. A., & Tang, J. ,2016). The earlier researches support the insignificant values.

It may be concluded that, HR Analytics is mostly used in recruitment, the reason being predictive analytics is most used in the organizations (Chalutz Ben-Gal, H ,2019). The use of chat bots helps in increasing the employee engagement (Gaur, B. ,2020) and also helps in completing the employee joining formalities i.e induction without human intervention(Gupta, P, 2018).HR Analytics helps in understanding the training gap by evaluating the skill sets an employee possess and required skill sets. It helps in revising the training material as per industry standards (Guru, 2021).

HR Analytics as it is data driven and the decisions are taken based on the identified parameters as per the HR policies framed; it reduces the biasness (Mondore, S., 2011) and also helps in finding out the reasons for attrition. Parameters related to working environment, number of years worked, travel frequency, marital status effect the attrition level (Setiawan, 2020).

Findings related to HR Analytics influence on organizational performance

To find out the HR Analytics influence on organizational performance, pearson correlation analysis is used after framing the following hypothesis

Null H₀₃: $r = 0$

[There is no significant association between HR Analytics and Organizational Performance i.e Reduced Costs, Employee Performance, Employee Retention, Effective and Efficient budget planning and Employee Engagement

From the analysis, the inference is drawn that there exists a high positive correlation between HR Analytics and Reduced Costs (Boakye, A. 2020), Employee Performance (Simbeck, K. 2019), Employee Retention (Fernandez, J. 2018), Effective and Efficient Budget Planning(Ben-Gal, H. C. (2019), and Employee Engagement(Margherita, A. 2021).

It may be concluded that the evidenced based management has effect on organizational performance (McCartney, 2022). The costs from HR department are one of the highest costs and HR Analytics helps to find out the new ways of employee

management (Etukudo, R. 2019) and reduces costs with the help of HR metrics. HR Analytics helps in effective decision making. HR Analytics helps the companies to build a strong network of resources that helps in improve the overall performance of the organizations (McCartney, 2022.)

HR Analytics can monitor the various costs and analyzes the amounts spent on different areas and helps in identifying the future monetary requirements, thus helps in budget planning (Karmańska, A ,2020).HR Analytics helps in identifying the involvement of an employee like with whom and why an employee is interacting and thus helps in understanding the workforce. If the managers have the data on employee's turnover,absentism, it helps them to understand the reasons for such and can improve engagement(Chamorro-Premuzic, 2020).

Findings related to factors for successful implementation of HR Analytics

In order to find out the most important factors for successful implementation of HR Analytics, correlation analysis and multiple regression analysis is used. The following hypothesis is framed

Null Hypothesis

$H_{04} = 0$:There is no significant relationship between HR Analytics implementation and Dashboard, Reward Systems, Easiness In Technology & Customized Software, Job Opportunities, Analytical Culture, Management Support, Quality Data, Enhanced Decision Skills, Opportunity to Use, Reduced Costs Support Function To Core Function

From the correlation analysis , it is drawn that there exists a positive correlation among all the variables. The multiple regression analysis is used to find out the extent of implementation factors. The Overall Model Fit table indicated that the model is suitable in predicting implementation factors for HR Analytics

The findings concluded that transforming HR from Support Function To Core Function (Dahlbom, 2020), Management Support(Pongpisutsopa, S.2020), Enhanced Decision Skills (Kremer, K. 2018), Opportunity to Use (Vargas, R 2018),

Dashboard(Fernandez, J. 2018), Reward Systems(Rondeau, K. V. 2018) However, there is no impact of other factors under the study i.e Easiness In Technology & Customized Software(Shet, S. V., 2021), Analytical Culture (Fernandez, V., & Gallardo-Gallardo, E. 2020), Reduced Costs(IBM Getting Smart About Your workforce,2009) signifying that they are insignificant factors for HR Analytics implementation in IT Industry. However, the above literature supports the reasons for such insignificance.

HR Analytics is gaining significance as the HR professionals see their department transforming from an administrative function to consultative function and their roles have become standardized (Dahlbom, P, 2020). The advancement of technology led HR Analytics to become strategic partner as it moved from intuition based to data driven based led to enhanced decision making. Innovation and trailable are the two factors that make HR professionals to see implementation of HR Analytics as an opportunity to use(Vargas, R 2018) and the availability of dashboards helps in taking learned decisions(Fernandez, J. 2018).

The advancement of technology made it mandatory for the employees to adopt to any technology and also the companies ability to train its employees on new technologies are making the employees feel comfortable in using this technology (Shet, 2021). The employees are used in adopting internal cultural changes due to radical technological changes (Fernandez, V, 2020). A report brings out that, though the high investment is required to implement HR Analytics, however the companies are looking such investment as an expenditure that helps in tax saving opportunity (IBM, 2009).

Findings related challenges and barriers in using HR Analytics

The following hypothesis are framed and multiple regression analysis is used

Null Hypothesis

- $H_{05} = 0$:There is no significant relationship between HR Analytics in IT Industry and Challenges and Barriers in using i.e Financial Aspect,Employee Resisitance,Quality Data,Analytical Skills, Trained & Expertise

From the multiple regression analysis it is concluded that the Trained & Expertise, ,Employee Resistance, Analytical Skills and availability of Quality Data are important and Financial Aspect is not at all a barrier in using HR Analytics in IT Industry.

The employees feel that they become non active and loose their willingness to work as the new technology may reduce their working abilities , hence, they resist to adopt to new technologies(Jain, P ,2020). The availability of quality data solely do not provide the purpose unless it is analyzed with the help of right statistical tools. At present , as HR Analytics is still in infancy stage and transformations are still to be made. Hence quality data with right statistical tool application are necessary (Opatha, H. H. D. P. J., 2020)

5.4 Conclusion of the Study

From the overall study, we can understand from Table 1.1 that the Artificial Intelligence is not highly integrated with HR Analytics , which infers that the IT companies are unable to utilize the Prescriptive Analytics. (Katerina Lepeniotia ,2020), Prescriptive Analytics helps in choosing the best alternative course of action however, to overcome the problems identified in Table 1.2 i.e Tracking The Employee Background, Attrition reasons and Employee participation which are important aspects of HR can be resolved only if the companies move to prescriptive Analytics. Hence, it is suggested for companies to concentrate on moving to prescriptive analytics. Thus moving to prescriptive analytics helps in overcoming the problems in tracking the employee background, knowing the attrition reasons and improving the employee participation.

From the Table 2.1 one can understand that the organization performance has linear relationship with the implementation of HR Analytics. Marler, J. H., & Boudreau, J.

W. (2017) pointed that there is evidence that HR Analytics influences Organizational Performance Hence, there is need for middle and upper level HR to show the with evidence how HR Analytics can help in improving organizational performance and should convenience the topmost management in implementing HR Analytics at all levels.

From the Table 3.5 we can interpret that the HR population is interested to implement HR Analytics as it elevates the importance of HR to management, however there is need to improve the analytical culture among HR employees at all levels which improves the quality data. The importance of data should be explained at lower level HR employees as it plays a vital role in decision making. Further the integration of Artificial Intelligence with HR Analytics will increase the data quality. Hence this is to be concentrated upon.

5.5 Practical Implications

The study helps the managers in identifying the HR Analytics level (Descriptive, Predictive or Prescriptive) and also HR practices that are needed to be concentrated upon. The present study highlights the importance of integrating the high end technology like Artificial Intelligence with HR Analytics as it helps in extracting the reliable data from various sources.

The study highlights how HR Analytics improves the organizational performance and identifying the functional areas that can be concentrated upon so as to reduce the costs, improves the employee performance, employee Retention, Employee Engagement and it also helps the HR managers in effective and efficient budget planning

The study reveals the factors that help in successful implementation of HR Analytics. The transformation is possible only if identify the important reasons, thus the study found such factors that helps which helps the HR Managers in successful implementation.

For any new technology implementation understanding the barriers is highly important that too HR Analytics is in infancy stage. The present study highlights the

barriers and thus helps managers to concentrate on those in order to overcome such barriers in advance.

5.6 Limitations of the Study

The target population is from CMM Level 5 companies that have implemented HR Analytics.

1. PCMM level companies are not considered , only CMM Level 5 companies are considered for the study
2. The study has not considered all the stakeholders perspective
3. Since HR Analytics is a new study, there is limited literature available covering all aspects

5.7 Scope for Further Research

1. Further research can be conducted in Banking and Pharma Sectors
2. Comparative analysis can be done about Organizational Performance based on the companies using HR Analytics and the companies that are not using HR Analytics
3. Further research can be conducted on Artificial Intelligence and HR Analytics
4. Further research can be done on how to improve decision making using HR Analytics
5. More quantitative research can be done.

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Appendix No. 1: Interview Protocol

The purpose of this interview protocol is to ensure consistency and dependability of the study by providing the researcher a guideline for interviewing the participants. The researcher is exploring the strategies HR managers use to implement analytics to improve Human resource management.

I will introduce myself to the participant as a Lovely Professional University, Punjab as a Doctoral student, explain the purpose of the interview and thank the participant for agreeing to the interview. I will show candidacy letter if needed.
I will present that the participants details will not be disclosed to any one and the responses will be solely used for research purpose only
I will inform the participant the interview will take approximately 40-60 minutes and seek Approval
I will ask some introductory questions
I will ask the questions related to the study
<i>What HR Practices are you using in your organization</i>
Do you believe that use of HR Analytics is influencing organizational performance?
Do you believe the factors that help in successful implementation of HR Analytics?
Do you believe that there are any challenges and barriers in using HR Analytics in your organization?
Thank the participant for his/her time and consent to be part of the study
Explain that I will meet the participant again to go over the interview transcript for their opinion
Greet the participant and remind them of the purpose of the follow-up interview
Share the interview transcript and give participant a few minutes to read the document
Is my transcript a fair representation of our discussion on this question? Did I miss anything? Or, What would you like to add?
Thank the participant once again for their time

Appendix No. 2: Questionnaire- Qualitative

Introductory Questions

1. How much experience do you have in HR
2. How long you have been using HR Analytics
3. What is your current designation

Questions related to Objects

1. May I know what HR Practices are you using in your organization
2. Do you believe that use of HR Analytics is influencing organizational performance
3. Do you believe the factors that help in successful implementation of HR Analytics
4. Do you believe that the there are any challenges and barriers in using HR Analytics in your organization

APPENDIX NO. 3

RESEARCH QUESTIONNAIRE

Questionnaire Survey on

HUMAN RESOURCE ANALYTICS IN INFORMATION TECHNOLOGY INDUSTRY:
AN EXPLORATORY STUDY IN HYDERABAD

Dear Sir/Madam,

I am a research scholar (Pursuing Ph.D) at Lovely Faculty of Business and Applied Arts, Mittal School of Business, Lovely Professional University, Phagwara, Punjab. This survey is a part of my academic research on various aspects of Human Resource Analytics in IT industry in Hyderabad. I request you to please spare 20-30 minutes from your precious time and give your valuable opinion/perception on the below given statements. Your personal information, response will be kept confidential, anonymous and its use will be limited to this study.

Thanks for cooperation & participation.

Research Scholar:

Paleti Narendar , Regd. No. 41900585, Lovely Professional University, Punjab.

Research Supervisor:

Dr. Mridula Mishra, Ph.D., Professor and Head of Department, Mittal School of Business, Lovely Professional University, Punjab.

SECTION-1

For multiple choices, put a tick mark (√) on most suitable option.

Profile of Respondent

1.1 Name :

1.2 Email ID :

1.3 Name of the Current Organization

1.4 **Designation**

Senior Manager or Equivalent ☐

Manager ☐

Sl.No	<u>SECTION -2</u> This section of questionnaire brings out the HR practices in IT Industry and reasons for using HR Analytics in IT industry. Kindly select the right option					
	Response rating scale Not at all-1 ; To a Small Extent -2 ; To a Moderate Extent -3 ; To a Large Extent -4 ; To a Very Great Extent -5					
2.1	To what extent data driven practices are used for HR Analytics	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.2	To what extent Artificial Intelligence is used for HR Analytics	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.3	To what extent statistical evaluations are being followed in HR Analytics	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.4	To what extent HR Analytics is used to assess and analyze practices are used	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.5	To what extent HRIS data is used	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.6	To what extent Artificial Intelligence is used for sourcing the job applicant	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.7	To What extent Artificial Intelligence chat bots are used	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.8	To what extent Artificial Intelligence helps in tracking Employee background through Social Media Analytics	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.9	To what extent HR Analytics playing role in decision making	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent

2.10	To what extent HR Analytics helps in revising the training program & materials	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.11	To what extent HR Analytics helps in identifying reasons for employee attrition	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.12	To what extent HR Analytics helps in improved work culture	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.13	To what extent HR Analytics helps in employee participation	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
2.14	To what extent Artificial Intelligence reduces the biasness	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent

SECTION-3

This section of questionnaire brings out the influence of Human Resource Analytics on organizational performance in IT industry. Kindly select the right option

Response rating scale

Not at all-1 ; To a Small Extent -2 ; To a Moderate Extent -3 ; To a Large Extent -4 ; To a Very Great Extent -5

3.1	To what extent cost are reduced because of HR Analytical Practices	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
3.2	To what extent HR Analytics affects employee performance	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
3.3	To what extent HR Analytics affects employee retention	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
3.4	To what extent effective and efficient budget is planned with HR Analytics	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
3.5	To what extent impact of HR Analytics affects employee engagement	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent

SECTION-4

This purpose of this section of questionnaire is to explore the factors for the successful implementation of HR Analytics in IT Industry. Kindly select the right option

Response rating scale

Not at all-1 ; To a Small Extent -2 ; To a Moderate Extent -3 ; To a Large Extent -4 ; To a Very Great Extent -5

4.1	To what extent HR Analytics dashboards are used in decision making	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
4.2	To what extent reward system helps in employee getting trained in HR Analytics	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
4.3	To what extent easeness in technology and customized softwares helps in HR Analytics implementation	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
4.4	To what extent job opportunities in HR Analytics make you to train on HR Analytics	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
4.5	To what extent analytical culture force you to train on HR Analytics	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
4.6	To what extent management support is required	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
4.7	To what extent quality data plays a vital role	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
4.8	To what extent decision taking skills are enhanced	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
4.9	To what extent you are excited to use the opportunity of using HR Analytics	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
4.10	To what extent reduced cost has effect on HR implementation	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent

4.11	To what extent HR Analytics helps in migrating HR department from support function to core function	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
<u>SECTION-5</u> This purpose of this section of questionnaire is to investigate the challenges and barriers encountered in using HR analytics in the IT industry. Kindly select the right option						
Response rating scale Not at all-1 ; To a Small Extent -2 ; To a Moderate Extent -3 ; To a Large Extent -4 ; To a Very Great Extent -5						
5.1	To what extent financial aspect is a constraint	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
5.2	To what extent employee resistance is a challenge	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
5.3	To what extent quality data is important	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
5.4	To what extent analytical skills are required	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
5.5	To what extent trained and expertise are needed	Not At All	To a Small Extent	To a Moderate Extent	To a Large Extent	To a Very Great Extent
<u>SECTION-6 (OPTIONAL)</u> This purpose of this section of questionnaire is to take the opinion on recommendations and suggestions on implementation of HR Analytics in IT Industry. This question is optional						
6.1	What are the suggestions for successful implementation of HR Analytics					

LIST OF PUBLICATIONS

Appendix. No	Article	Journal Name
4	Impact Of HR Analytics On Training And Development In An Organization	PSYCHOLOGY AND EDUCATION 58 (1), 3606-3614, 2021
	Analyzing the Impact of HR Analytics on Organizational Performance of IT Industry – Mixed Methodology Approach	Webology 18 (2-2021), 1739-1751
	Effectiveness of HR Analytics in Recruitment Process	Empirical Economics Letters, 20 (Special Issue 4) (July 2021)
	HR ANALYTICS IN CRISIS TIMES OF RECRUITMENT IN ITES COMPANIES- A CASE STUDY	Vidyabharati International Interdisciplinary Research Journal Special Issue on Emerging Techniques in Interdisciplinary Sciences (Oct. 2021) ISSN 2319-4979

LIST OF CONFERENCES

Appendix. No	Conference Details	Paper Presented
5	Doctoral Conference “Strategic Management Forum Annual Conference 2021” conducted by <i>INDIAN INSTITUTE OF MANAGEMENT</i> , NAGPUR	HR Analytics: Supporting Factors , Challenges and Barriers In Implementation - A Mixed Methodology Approach
	Doctoral Conference by Woxsen University in collaboration with HHL Leipzig Graduate School of Management, Germany and Johannesburg Business School, South Africa	Human Resource Analytics In Information Technology Industry: An Exploratory Study In Hyderabad
	International Conference “Rethinking Business: Designing Strategies in the Age of Disruptions” conducted by Mittal School of Business, LPU	A Review on Present Position of Human Resource Analytics in India”
	International Conference <i>Post COVID Management Strategies: Recovery, Resilience & Adaptation IIM BODHGAYA</i>	HR Analytics: A Study on Implementation Challenges in Software Companies”
	3rd International Conference on Sustainable Developmental Goals and Management Practices-2022	Artificial Intelligence In HR Analytics – Way Forward

LIST OF COURSES/WORKSHOPS

Appendix No.	Certificate	Course Name
6	Certificate of Participation from LPU HRDC	Refresher Course on Mixed Methods
	Amity University workshop	Research Project Writing and Data Analysis
	Certificate of Participation From Lovely Professional University	Intellectual Property Rights and Atmanirbhar Bharat
	Certificate of Participation from IIM BODHGAYA	Research Methodology
	Certificate of Participation from LPU HRDC	Refresher Course On Research Methodology And Data Analysis