CHAPTER 4

RESEARCH METHODOLOGY

4.1 SCOPE OF THE STUDY

The total analytics market in India in the year 2007 has been one third of the global market which stands at $17 billion, the number of data and analytics companies have increased significantly in the last ten years since 2007. Despite such a phenomenal growth, adoption of analytics for decision making has still not taken off. Retail companies with their CRM and ERP applications are able to accumulate large data. But, the exact use of this data for decision making purposes has still not found light.

Analytics is a term which is still not understood fully and not used universally by all corporates. The usage of the terms like ‘metrics’, ‘quantitative’ for the term ‘analytics’ are still in practice.

This study attempts to find the familiarity of the corporate with the term ‘analytics’, its adoption, the extent of adoption, adoption of analytics in the functional areas of business, functional areas of human resource management where analytics is adopted and if analytics is used, is it helping them in making decisions, is there a suitable data environment for adoption of analytics and the challenges for use of analytics for the purpose of decision making.

The study covers three sectors, namely IT, Retail and Manufacturing. Since, analytics has a close association.

In the IT value chain which starts with basic data entry and other basic support services, moves up the ladder to provide programmed IT products and applications. At the highest level in the value chain of IT business, IT strategic consulting, business intelligence and analytics comprise the major part. Hence to understand adoption of analytics, it is very important to study the IT sector.

The growth of online organized retailing through companies like flipkart, amazon, snapdeal, etc in which the customer movement and their behavior is becoming more crucial with a huge surge in online buying. Retail analytics and web analytics enables companies to recognize and track customer behavior through the click streams. BI that
is Business Intelligence and data mining tools are used by offline retailers in customer relationship management. Retailers have to build key organization/infrastructure focusing on data structure, organizational systems, technology structure, and data accessibility. Retailers have their set objectives, on which the strategies will be designed, giving major importance on sales & marketing, understanding customer needs and exploring better markets and sustaining in such markets and creating immense brand loyalty, all this would be possible with appropriate data collection and analysis of which can happen through data analytics. Hence retail sector is an important sector to study the adoption of analytics for decision making.

There are major global competition faced by the manufacturing sector, that in turn leading towards effective and efficient manufacturing process, which is the crucial factor for success. Usage of various analytical methods are leading towards continuous improvement process in the field of manufacturing.

The process and implementation of data analytics will help to integrate operational and process manufacturing data. However, in Indian scenario, there is a need to explore to what extent, analytics and business intelligence is adopted and the purpose for which it is adopted. Hence there is a need to study analytics in these sectors namely IT, Retail and manufacturing.

4.2 STATEMENT OF THE PROBLEM

The boom of the dotcom companies in 1990s showed a positive trend, however over a period of time, it became nonexistent. In the last few years, boutique analytics companies have emerged showing a very progressive development. The Indian analytics industry is getting recognized as a sector which is expected to contribute majorly to India’s GDP. The data generated at the individual and organization levels is pushing corporate to adopt analytics in their organizations. Digitization of transactions, virtual dealings and online retailing and ecommerce is making it critical for businesses to adopt analytics with the increased awareness and use of analytics tools, Indian corporate are slowly creating data environment leading to analytics. In this context, it is imperative to study the adoption level of analytics in Indian corporate.
4.3 RESEARCH OBJECTIVES

- To understand the adoption of HR Analytics in organizations across different sectors.
- To study the extent and usage of adoption of HR Analytics in different HR functions in organizations.
- To assess the level of analytics adopted in organizations.
- To study data environment for adoption of analytics in the organizations across different sectors.
- To study the impact of adoption of HR analytics on decision making in the organizations.
- To explore the challenges faced by organizations in adoption of HR Analytics across different sectors.

4.4 RESEARCH HYPOTHESES

BASED ON OBJECTIVE 1

Hypothesis No 1

Ho: There is no difference in adoption of data analytics in organizations across different sectors.
H1: There is difference in adoption of data analytics in organizations across different sectors.

Hypothesis No 1a

Ho: There is no difference in adoption of HR analytics in organizations across different sectors.
H1: There is difference in adoption of HR analytics in organizations across different sectors.
BASED ON OBJECTIVE 2

Hypothesis No 2a

Ho There is no difference in adoption of HR analytics in Recruitment as HR function in organizations across different sectors.

H1 There is difference in adoption of HR analytics in Recruitment as HR function in organizations across different sectors.

Hypothesis No 2b

Ho There is no difference in adoption of HR analytics in Human Resource Planning as HR function in organizations across different sectors.

H1 There is difference in adoption of HR analytics in Human Resource Planning as HR function in organizations across different sectors.

Hypothesis No 2C

Ho There is no difference in adoption of HR analytics in Employee Relations as HR function in organizations across different sectors.

H1 There is difference in adoption of HR analytics in Employee Relations as HR function in organizations across different sectors.

Hypothesis No 2d

Ho There is no difference in adoption of HR analytics in HR functions in organizations across different sectors.

H1 There is no difference in adoption of HR analytics in HR functions in organizations across different sectors.

Hypothesis No 2e

Ho There is no difference in adoption of HR analytics in HR functions in organizations across different sectors.

H1 There is difference in adoption of HR analytics in HR functions in organizations across different sectors.

Hypothesis No 2F

Ho There is no difference in adoption of HR analytics in HR functions in organizations across different sectors.
H1 There is no difference in adoption of HR analytics in HR functions in organizations across different sectors.

**Hypothesis No 2G**

Ho There is no difference in adoption of HR analytics in HR functions in organizations across different sectors.

H1 There is no difference in adoption of HR analytics in HR functions in organizations across different sectors.

**BASED ON OBJECTIVE 3**

**Hypothesis No 3a**

Ho: There is no difference in adoption of basic levels of analytics across sectors.

H1: There is difference in adoption of basic levels of analytics across sectors.

**Hypothesis No 3b**

Ho: There is no difference in adoption of intermediate levels of analytics across sectors.

H1: There is difference in adoption of intermediate levels of analytics across sectors.

**Hypothesis No 3c**

Ho: There is no difference in adoption of basic multivariate levels of analytics across sectors

H1: There is difference in adoption of basic multivariate levels of analytics across sectors

**Hypothesis No 3d**

Ho: There is no difference in adoption of advanced multivariate levels of analytics across sectors.

H1: There is difference in adoption of advanced multivariate levels of analytics across sectors.
BASED ON OBJECTIVE 4

Hypothesis No 5a

Ho  There is no relationship between adoption of HR analytics and environment in organizations across different sectors.
H1  There is relationship between adoption of HR analytics and environment in organizations across different sectors.

Hypothesis No 5a

Ho  There is no difference between environmental factors supporting adoption of HR analytics in organizations across sectors.
H1  There is difference between environmental factors supporting adoption of HR analytics in organizations across sectors.

Hypothesis No 5b

Ho  There is no difference between environmental factors supporting adoption of HR analytics in organizations across sectors.
H1  There is difference between environmental factors supporting adoption of HR analytics in organizations across sectors.

BASED ON OBJECTIVE 5

Hypothesis No 6

Ho  There is no relationship between adoption of HR analytics and perceived benefits in organizations across sectors.
H1  There is relationship between adoption of HR analytics and perceived benefits in organizations across sectors.

Hypothesis No 7

HO  The adoption of HR Analytics does not have an impact on improving company’s efficiency and productivity.
H1 The adoption of HR Analytics does have an impact on improving company’s efficiency and productivity.

**Hypothesis No 7a**

H0 The adoption of HR Analytics does not have an impact on the company’s decision making process.

H1 The adoption of HR Analytics does have an impact on the company’s decision making process

**Hypothesis No 7b**

H0 The adoption of HR Analytics does not have an impact on the company’s decision making process.

H1 The adoption of HR Analytics does have an impact on the company’s decision making process

**BASED ON OBJECTIVE 6**

**Hypothesis No 8**

H0 There is no relationship between organizational challenges and HR analytics in organizations across different sectors.

H1 There is relationship between organizational challenges and HR analytics in organizations across different sectors.

**Hypothesis No 9**

H0 There is no difference between organizational challenges and extent of usage of HR analytics.

H1 There is difference between organizational challenges and extent of usage of HR analytics.
Hypothesis No 9a

Ho  There is no difference between organizational challenges and extent of usage of HR analytics in organizations across sectors.

H1  There is difference between organizational challenges and extent of usage of HR analytics in organizations across sectors.

Hypothesis No 9b

Ho  There is no difference between organizational challenges and extent of usage of HR analytics in organizations across sectors.

H1  There is difference between organizational challenges and extent of usage of HR analytics in organizations across sectors.

4.5 RESEARCH METHODOLOGY

Research methodology represents the research approach and research design for this particular study. This particular section clearly justifies the mode of research design adopted towards the problem of research. It clearly indicates the data collection procedure along with the various techniques of analysis of data collected for further interpretation. The main purpose of methodology is to give a connectivity between research problem and the process by which this problem can be solved. This chapter gives a clear understanding in two parts. Initially it explains about the types of data, methods of sampling, ways of analyzing the collected data. The next part gives us the relevance of accuracy of the same. This chapter on research methodology clearly explains about the research design, data collection, methods of sampling, sampling population, sampling frame, data collection instrument, hypotheses framed and statistical tools used to prove the hypotheses.

Descriptive Research is adopted to know the Level of Adoption of HR Analytics in organizations across different sectors. Descriptive research analysis as been adopted in the present study. Population ideologies illustrated is what we understand in the descriptive approach Kothari (2005), it is not something which is in a poetry form, but still it brings in the originality illustration. The data collected from the population is further tested through quantitative techniques and are interpreted through various
numbers and graphs and other statistical tools, while others are qualitative with why and how elements and a case study has been considered and from each sector one organization has been chosen by the researcher under case study methodology. Identification of practical conditions will occur by descriptive research. Gregory (2002) states that the data collected will be compared and assessed. Descriptive research helps in understanding the actual situation, practical problems, instances and process and further they are analysed using statistical tools and further interpreted with the results. Further based on the results analysed the further relationships can be drawn and used by the organizations for further decision making process Kumar(2005). The present study considers the descriptive research and studies in detail the adoption of HR analytics in Indian Corporate.

4.6 DATA COLLECTION

4.6.1 METHODS OF SAMPLING: Under the probability sampling method, stratified random sampling is one where the researcher divides the entire population into homogeneous groups known as Strata and the members for final analysis will be chosen randomly from various strata for research which further helps in reduction of cost and efficiency is increased. Distinctness among individuals is needed so that each one can get an opportunity to be selected as a sample. It can also be called as “Random Quota Sampling”.

The initial identification of target audience was been made by the researcher and that is HR executives/HR managers/Senior managers. Various stratification variables were identified and the number of strata to be used was also identified as three different sectors, based on the research objective. Not more than six strata will be considered for the study, inflation in stratification leads to cancellation of some variables. Based on the stratification variable, sampling frame was created.

Accordingly, interview schedules were administered to seventy five such organizations. The fifty one interview schedules received from the HR managers, duly completed, were considered for the study. The researcher selected organizations with an experience of at least ten years. This criterion, according to the researcher, is the most appropriate one for the present study. Those organizations, where respondents gave the complete
information are considered. Some of the respondents have not given clear information and the data which could not be validated are removed.

**4.6.2 SAMPLING POPULATION**: We have considered those organizations were respondents have given the complete information. Some of the respondents have not given clear information, which were not validating for contribution were removed.

<table>
<thead>
<tr>
<th>No of Organizations</th>
<th>Retail Sector</th>
<th>Manufacturing sector</th>
<th>IT sector</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of Organizations Responded</td>
<td>20</td>
<td>15</td>
<td>25</td>
<td>60</td>
</tr>
<tr>
<td>No of Organizations considered for final analysis</td>
<td>16</td>
<td>10</td>
<td>25</td>
<td>51</td>
</tr>
</tbody>
</table>

Out of 60 organizations, **51** organizations are chosen from three different Sectors, (IT, Retail, Manufacturing Sectors). 16 organizations from Retail sector, 10 organizations from Manufacturing sector and 25 organizations from IT sector are chosen.

**4.6.3 PILOT STUDY**

There was a pilot study which was conducted using questionnaire among twelve respondents being HR managers from organizations existing for more than ten years and managers experienced for at least two years in an organization. Before distributing the questionnaire to the actual respondents for the pilot study, the questionnaire was circulated among selected senior HR managers and experts from academics. They have rated the statements, those rated statements were further calculated with mean scores, the scores more than three were taken into consideration, if weight age was less, the researcher has deleted such statements. From twelve respondents the data collected was analysed and the extent of responses variation was identified.

Propotional to the level of variation and level of error, the sample size was stated of the population under the study. As many as 16 statements grouped separately based on HR functions, environmental factors, contribution to organization based on adoption of analytics and organizational challenges relating to adoption of HR analytics in
organizations across sectors were used for determining the sample size. At 5% level of error these responses variances was identified under the pilot study and sample size was obtained based on individual response.

Of the data collection both qualitative and quantitative methods were made by the researcher, case study methodology was adopted under qualitative methods. Three organization, each one from one of the sectors, that is IT, retail and manufacturing were taken into consideration and a detailed study was conducted by the researcher to understand the adoption of analytics in human resources in the respective organizations. The concept of human resource analytics though it is well implemented in western organizations, depth of adoption is relatively to a less extent in Indian organizations in comparison to western countries due less awareness and perceived risk is more. Based on all this background study, the researcher has made an attempt to identify fifty one organizations from IT, retail and manufacturing sector who have adopted human resource analytics and has tried understanding the extent of level of adoption of analytics and the environmental factors affecting the respective organization across sectors along with the organizational challenges and the perceived benefits.

4.6.4 METHODOLOGY

Descriptive study as been considered in the study with fact finding survey method. For collecting primary data, interview schedules were prepared. Being a structured / directive interview, the interview was conducted with a detailed standardized schedule.

4.6.5 SOURCES OF DATA COLLECTION

Both primary and secondary sources of data collection was made in the present research

- Primary Data: Primary data has been collected from organizational HR executives from three different sectors that is Retail, manufacturing & IT in Bangalore city by using a interview schedule. Primary data involved gathering of first hand information by the researcher.

- Secondary Data: Secondary data has been collected from the offices and web sites of entities like Deloitte, IBM, reports from NASSCOM, ministries as well as the various departments of human resources and corporate affairs of the
government of India. Since secondary data is sourced from authorised and reliable agencies/entities.

4.6.6 DATA COLLECTION INSTRUMENTS

With pre testing, the possible weaknesses in the instrument was recognised. Revision and finalization was made with the feedback system and further it was produced to the individual respondents for data collection through primary source of data collection. Few open questions were given to understand the concept of analytics and its usage in different sectors. With open questions the depthness of individuals responses can be captured (Krishnaswamy & Ranganatham, 2005). Further tools like Likert scale is considered for marking the respondents response.

Several HR analytics angles were probed and different dimensions were identified by the researcher, like suitable data environment for adoption of analytics, challenges faced by organization in such adoptions, different levels of adoption of analytics, impact on decision making by such adoptions and also the various functional areas in which data analytics are being adopted and in particular the extent of adoption of HR analytics in different HR functions.

The secondary data is based on reputed journals, books, official websites of organizations, various official reports from NASSCOM, MOSPI, various organizations website like Deloitte, IBM was also extensively used to get the details of various HR analytics & metrics.

Table 4.2 Reliability Test of Questionnaire

<table>
<thead>
<tr>
<th>Extent of adoption of HR Analytics in organizations across sectors</th>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental factors</td>
<td>0.960</td>
<td>10</td>
</tr>
<tr>
<td>HR metrics</td>
<td>0.920</td>
<td>14</td>
</tr>
<tr>
<td>Analytical Reporting</td>
<td>0.965</td>
<td>13</td>
</tr>
<tr>
<td>Perceived Benefits</td>
<td>0.971</td>
<td>16</td>
</tr>
<tr>
<td>Organizational Challenges</td>
<td>0.948</td>
<td>10</td>
</tr>
</tbody>
</table>
The questionnaire which was designed based on the literature review and discussions with the experts from corporate and academics, was put to reliability test of cronbach’s Alpha. Depending upon the factors that the various constructs and statements were grouped under different factors and table 1 depicts the results that are good enough to conduct a study based on the questionnaire constructed for the research.

Questionnaire was divided into three parts, part A comprised Respondents profile, part B comprised Analytics profile of the organization and part C comprised Extent of usage and implementation of human resource analytics in the organization. Extent of environmental factors present, extent of HR functions implemented, extent of HR metrics implemented, extent of preparation of HR analytical reports implemented in organization, extent to which analytics has contributed in the organization, extent to which analytics challenges faced by organization. The extent was measured through Likert Scale as mentioned in the following table.

<table>
<thead>
<tr>
<th>To a very large extent</th>
<th>To large extent</th>
<th>To some extent</th>
<th>To a small extent</th>
<th>To least extent</th>
</tr>
</thead>
</table>

### 4.6.7 FIELD WORK

The respondents were contacted personally through various sources and were requested to give their views about the related information, further the questionnaires were given to them and the responses were collected. The researcher faced as many issues while getting the response, because the information needed being strategic decision, some of the companies were not ready to reveal information. Further it took some efforts by the researcher to convince them in the right way and to assure that the researcher is not appointed from any competitors.

### 4.6.8 POPULATION

The population for the study analyzed the HR departmental heads, executives and senior level managers in Bangalore city of Karnataka.
4.7 HYPOTHESES DIRECTIONS

Chart 4.1 Showing Hypotheses Directions

4.8 CONSTRUCT & ITEMS OF THE SURVEY

Table 4.4 Construct & Items Of The Survey

<table>
<thead>
<tr>
<th>CONSTRUCT</th>
<th>MEASUREMENT ITEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizations Across Sectors</td>
<td>IT sector&lt;br&gt;Retail sector&lt;br&gt;Manufacturing sector</td>
</tr>
<tr>
<td>Levels of analytics</td>
<td>Basic Analytics&lt;br&gt;Intermediate Analytics&lt;br&gt;Basic Multivariate&lt;br&gt;Advanced Multivariate</td>
</tr>
<tr>
<td>Suitable Environment</td>
<td>Management support&lt;br&gt;Training in Analytics&lt;br&gt;Qualified staff&lt;br&gt;Data model development&lt;br&gt;Suitable Data Environment&lt;br&gt;Awareness about analytics&lt;br&gt;Sufficient knowledge about analytics&lt;br&gt;Increase in HR analytics&lt;br&gt;Data concern</td>
</tr>
</tbody>
</table>
| Functional Areas in HR Dept | Recruitment  
Human Resource Planning  
Employee Relations  
Compensation and Benefits  
Compliance  
Training and Development  
Performance appraisal review and processing  
Awards review and processing  
Calculation of Attrition rates  
Absence of Employees  
Succession Planning  
Personnel data entry and record maintenance  
Career Planning |
|---------------------------------|---------------------------------------------------------------|
| Organizational Challenges | Budget Constraint  
Time consuming  
Lack of Training  
Lack of data  
Complications in procedure  
Comfort with the present system  
Unaware of the Usage  
Limited knowledge on the benefits  
Lack of Transparency in decision making  
Manager's Judgmental decision |
| Decision Making | Enabled focus on business results  
Developing data driven organization  
Contributed towards effective change management  
Assessing and improving HR department operations  
Enabled Managerial Judgments  
It has contributed in taking routine decisions  
It has contributed in taking strategic decisions  
Increase in Productivity of the organization  
It has reduced Risk  
It has reduced cost  
Improved Financial Performance  
Finding New ways to approach business issues  
Helps in Retention of high performing talent  
Developing existing talent for future leadership or scarce skill roles  
Managing labor and skills to ensure business continuity and operations |
We rarely use data to inform workforce decisions.
Increase in return on investment over employees
Serves as a source of competitive advantage for organizations
Track the developments and the trends
Administers the assigned functions

4.9 LIMITATIONS OF THE STUDY

It is possible that a certain degree of subjectivity, albeit negligible, has found its way in. In addition, one has to admit that the respondents could err. Hence, the researcher would admit that the findings from the thesis, which draw equally heavily with the discussions the researcher held with said respondents, may have affected, albeit to negligible extent. In the circumstances, it will not affect the accuracy of the findings of the study. The study is based only on horizontal section of Indian Industry. The study is concentrated only on organizations located in Bangalore.

4.10 CHAPTER SCHEME

CHAPTER 1: INTRODUCTION

This chapter presents the framework of the study. It gives us the clear understanding of advancement of technology and its impact on organizations. This chapter brings out the importance of the present study and the relevance of human resources analytics.

CHAPTER 2: GROWTH AND TRENDS IN HUMAN RESOURCE ANALYTICS

This chapter focuses on theoretical framework for human resources analytics, importance of analytics, history of HR metrics and workforce and various concepts relating to human resources analytics has been studied in this chapter.
CHAPTER 3: REVIEW OF LITERATURE

Chapter three reviews the relevant literature on human resource analytics gap both in India and foreign countries. An attempt as been made to understand the linkage between the present study and other related works. This chapter focuses on studies related to workforce stress, decision making and its effectiveness, review from retail, manufacturing and IT firms are also considered. In this chapter an attempt is made to identify the gap existing in the literature to find out the necessity of the study.

CHAPTER 4: RESEARCH METHODOLOGY

The present chapter explains about the scope of the study, need for the study, problem statements, objectives & hypotheses of the study. It also includes detailed section on research methodology such as methods of sampling adopted, sampling population, sources of data collection, data collection instruments and limitations of the study.

CHAPTER 5: INDUSTRY PROFILE

In this fifth chapter, an attempt is made to explain the importance of study of three different sectors, that is IT, retail and manufacturing and its relevance with human resource analytics.

CHAPTER 6: ANALYSIS & INTERPRETATION

This chapter deals with the analysis of field survey undertaken for the study. The analysis is based on the adoption of human resource analytics and its challenges in organizations across different sectors. This chapter is divided into four parts, that is part A which deals with the respondents profile analysis, part B deals with the mean score analysis, part C deals with hypothesis analysis and part D deals with case study analysis.

CHAPTER 7: SUMMARY OF FINDINGS, CONCLUSIONS & RECOMMENDATIONS

This chapter presents the findings and suggestions based on data analysis and interpretation, interviews and observations made during research. Conclusion is given based on the overall research experience.