ANALYSIS of DATA ON EMPLOYEE PERFORMANCE AND RESIGNATION

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ABSTRACT

Employability satisfaction have been susceptible in increased risk and challenges in the highly vulnerable and ambiguous business environment where string employee relation management is at stage with poor connectivity thereby leading to poor decision-making within the organisation. Insufficiency in time in managing the replacement of personnel and lack of effective learning and investment in human resource management process may result in poor employability that will result in higher level of dissatisfaction within the organisation. Employee resignation is increasing which in accelerating the burden and cost of companies. Quality acceleration of employees has direct positive impact, but effective business continuity and strategic growth requires motivation and employee retention strategy helping in reduction if the detrimental impact of high rate of attrition and employee turnover.

CHAPTER 1: INTRODUCTION

1.1. Research background

The contemporary business environment has radically changed with the complex integration of procedures, forces of globalization stringent regulation and competition pressure shaping the overall real of the business environment. This has encouraged continuous growth and competency development by optimally leveraging resources helping in addressing the strategic objectives of the organisation. High quality employees with talent and ability in contributing effective acumen within organization. are considered as valuable resources to the company. Quality acceleration of employees has direct positive impact, but effective business continuity and strategic growth requires motivation and employee retention strategy helping in reduction if the detrimental impact of high rate of attrition and employee turnover (Stone et al. 2020). The corporate values need to connect the employer needs helping in develop long-term commitment as an important approach of addressing high-performing learning organisation. However, there are an array of reason which has increase the rate turnover and large number of employees are leaving and are searching for viable alternatives in different sectors.

The advent of the current pandemic has radically changed the workforce scenario in different industry including sector like mining and related sector (Petrova et al. 2020). Mining is one of the most important sectors with

effective contribution to national output and there is relational connectivity with other manufacturing sectors within the business environment. High end technology integration, of capability development in operating in cloud based virtual environment and increase workload has demotivated a section of employees in making effective commitment to remain integrated within the organization (Claus, 2019). There is negative influence of the employability which has resulted researcher in developing research evaluation in analysing employee performance and resignation supporting the assessment of empirical evidence evaluation to assess the relation between them.

1.2 Problem statement

Employee resignation leads to the most pressing issue on organisational issue of high attrition and turnover which has direct impact on the productivity of the organisation. Measuring performance and resignation with effective analysis is necessary that will help in taking comprehensive action in migrating the   issue with focus on gaining employee engagement and motivation (Baiyere et al. 2020). Employability satisfaction have been susceptible in increased risk and challenges in the highly vulnerable and ambiguous business environment w ere string employee relation management is at stage with poor connectivity thereby leading to poor decision-making within the organisation. Insufficiency in time in managing the replacement of personnel and lack of effective learning and investment in human resource management process may result in poor employability that will result in higher level of dissatisfaction within the organisation. Employee resignation in increasing which in accelerating the burden and cost

of companies (Petrova et al. 2020). There is direct impact on the overall training, development, recruitment, and selection of the employees leading to poor optimisation of the resources integrated to address overall benefit of the organisation.

1.3 Aims and objectives

1.3.1 Aim

The research aims to understand the analysis of data on employee performance and resignation. This will help in broadening the spectrum of knowledge about employee turnover amid its relationship with employability satisfaction that are necessary driven in managing growth capability in organization operating in different business sectors.

1.3.2 Objectives

The research objectives that will justify the overall study includes

- To analyse and collect the employability performance in the organization
- To improve the workforce environment by defining talent analytics, workforce analysis and people analytics
- To measure the evidence of the employee skills and knowledge for contributing the organizational strategies and goals

The fulfilment of these research question will help in developing understanding of the importance of analysing data of employee performance and rate of resignation determining the level of commitment and engagement in fulfilling the broader goals and mission.

1.4 Research questions

The research will address the objectives and aim to answer the following questions which will help in the effective justification of the research objectives designed to validate the overall study.

What is the relation between employability performance and the level of employee engagement within the organisation?

How can the organisational culture be improved by taking advantage of talent analytics, workforce analysis and people analytics?

How are the evidence of the employee skills and knowledge measured for the contribution of organizational strategies and goals

1.5 Research rationale

Employees form the core of any organisation because the performance in an organisation is dependent upon the contribution of the employees. In heavy industries such as the Mining industry that employs a huge workforce, the contribution of individual employees as an important role to play in the performance of the daily functions. However, in recent times there had been several concerns associated with employee absenteeism and resignation in heavy industry like the Mining industry. There might be various reasons for the employee resignation that can be understood based on the data collected on the employee performance, issues faced by the employees in this industry (Zaman et al. 2019). Addressing the concerns of employee resignation in the Mining industry, the research study in this research investigation will analyse data on the employee performance and resignation to understand the core reason for such challenges to employee management in the Mining industry. Without adequate strategies for employee retention the overall efficiency in employee management is affected that often leads to the problem of employee resignation (Willard-Grace et al. 2019).

However, to understand the key reasons for employee resignation it is important to gather data on their issues and performance. With significant advancements in technology there is use of analytics for data gathering and data analysis in organisation with respect to employees that can be helpful in predicting the risks to employee retention (Reyes et al. 2019). In recent times data analytics had come to the rescue of employee management yet the area of research on the use of analysis of data on employee performance and resignation by using analytics remains at a nascent stage. People analytics and walk analytics have been used to analyse data on people in organisations. This use of analytics is addressing the problem of data gathering an employee that is accurate reflection of their role and contribution as well as their intention to remain in their workplace (de Jesus et al. 2018). The use of analytics for analysing raw data can provide a large spreadsheet of data on employees that can be analysed and compared. Data on the characteristics of employee performance; statistics on employee retention; absenteeism; predictive analysis of staff members likely to leave the company are important data that can be gathered for employee management.

1.6 Research significance: theoretical and practical contribution

The research to be conducted holds great significance from the theoretical viewpoint for informing the future studies and developing theoretical framework for employee management in organisations. The research study will help to understand the theories of employee management and address the concerns of employee resignation and employee performance management in the future studies focusing on the data gathered on employees. From the practical viewpoint the study is significant because it can help to reduce the risks of employee resignation in in organisations that are struggling with huge employee turnover (Darmawan et al. 2020). Such organisations can collect data using advanced technologies and analytics and the regular data on employee performance, absenteeism, use of predictive analytics to predict resignation risks to reduce the risk of employee resignation. Resignation of employees leads to huge costs for organisations that can be controlled if the organisations in know which kind of data to be analysed and used analytics and advanced data sets to assess employee information (Follmer et al. 2018). Employee management can be enhanced in big organisations that face challenge in retaining organisations by accessing and using data on them to develop strategies for employee retention and performance management.

1.7 Structure of thesis

The thesis is divided into the following sequential and connected chapters:

Chapter 1: INTRODUCTION	**The chapter discusses the objectives and purposes of the research with evaluation of the rational and problem statement helping in analysing the main aspects and contribution of the research**
Chapter 2: LITERATURE REVIEW	The chapter will discuss the existing literary sources that have explored the concept of employee performance and satisfaction. The section will discuss the insight of different scholars with assessment of the loopholes that the existing research have and how our research will be utilising in fulfilling the literature gap.
Chapter 3: RESEARCH METHODOLOGY	The different tools and techniques that are applied in developing the overall study is discussed in this chapter. This includes the identification of the research design, research philosophy, research approach that will help in developing understanding about the data collection and data analysis technique thaw will be most feasible in the overall validation of the research.
Chapter 4: DATA PRESENTATION, ANALYSIS AND DISCUSSION	The chapter highlights the findings of the research, from collection and analysis of information pertaining to the study objectives. The discussion of the findings is developed helping in addressing inferential insights from the study that are presented to justify the research
Chapter 5: SUMMARY AND CONCLUSIONS	The chapter summarises concerned study by linking with the findings and the objectives. The section further depicts the research scope, limitations with highlighting of recommendations

Table 1: Structure of the Thesis

(Source: Created by author)

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter represents the literature about the concerned topic, which is the analysis of the data on employee performance and resignation. In recent times as the generation of data has become huge and the technologies for assessing the data have emerged, so businesses are using data analysis approaches for providing evidence-based decisions. Thus, in this chapter, the literature will be highlighted, in which the role of data analysis will be given for detecting employee performances and the reasons for the employees' resignations from the organisation. Moreover, from the concept of data analysis to the recommended usages of the data analysis one manager can come to know the employees' performance and the environment of the organisations. This literature review will also reveal the relationship between employability performance and the level of employee engagement for that matter. For improving the workforce environment of an organisation, they need to analyse the talent, workforce, and people to know the stakeholders from starting to the end. The research review will also discuss the analysis of the employee's skills and knowledge through

which the performances of employees can be understood. Therefore, the analysis of the data can help one organisation to take valuable decisions for its growth.

2.2 Concept of the Data analysis

Data analysis is the process, in which one can apply statistics or other logical techniques for describing, illustrating, and evaluating any data set. In general, data analysis has some tools through which they can analyse the past or future to make decisions based on that. It is opined by Hillier (2022) that some of the tools for the data analysis are Tableau, RapidMiner, SAS and Apache Spark. Hence, with all these tools, the data sets can be assessed, and the data visualisation can be developed to help one organisation to take valuable decisions for that matter. Moreover, some detailed functions of the data analysis are that of business intelligence, statistical analysis, SQL console and the automation of the operations. In the opinion of Ham and Park (2020), seven steps are needed for the development of the data analysis such as defining the question, collecting the data, cleansing the data, analysing the data, sharing the results, embracing the failures, and making a summary of those results so far. Each step is required for the understanding of any raw data and the fruitful results from it.
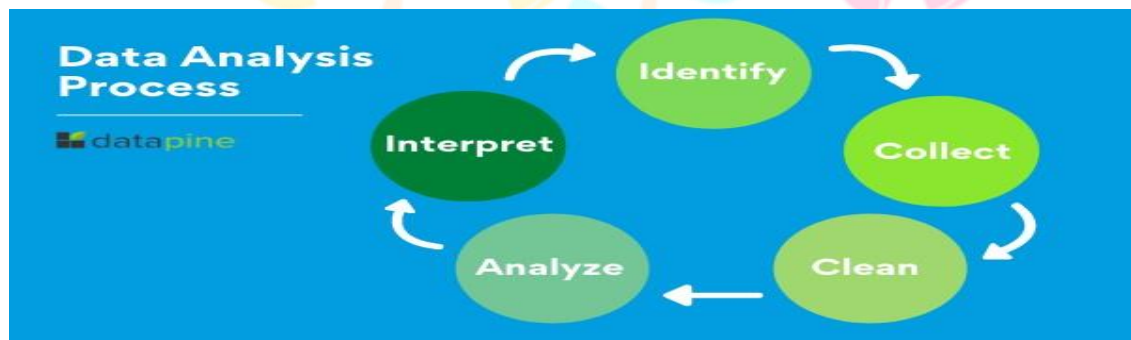

Figure 1: Data Analysis Process

(Source: Antunes *et al.,* 2019)

At the very beginning by asking questions, the objectives of the data engineers can be cleaned, and they can step over the desired goals. According to Statista Research Department (2022), from the global perspective, big data analytics was valued at $168.8 billion in the year of 2018. On the other hand, in the year 2029, it is expected that the value can go up to that of the $655 billion big data analytics market. Thus, by clearing the objectives the data set can be collected that could help to reach the objectives so far. Hence, the numeric data to the descriptive data can be collected for analysing the data-driven approaches so far. It is opined by Antunes *et al.* (2019) that the cleaning up of the data is the utmost important task for any data analysis approach. Hence, as the raw data do not come with the sequence it is necessary to clean up the data in such a way that the right kind of results could emerge from it. Some of the functions of cleaning the data are removing duplicates, and unwanted data points, structuring the data and filling up the major gaps so far. In the end, they analyse the data according to the objectives of the customers.

2.3 Importance of the Data analysis to evaluate the performance of the employability

The metrics of the data-driven approaches for understanding the performance of employability require a high level of management and evidence-based decisions to be taken from the very beginning. In the below, some of the advice on the performances of employability of the candidates are given based on the data.

Optimise Onboarding: It is the first opportunity for an organisation to take on the performance baseline for the new employees so far. In the opinion of Young (2022), the best way the management the onboarding is that of building the low stakes testing into the onboarding processes for that matter. The test data would not do their job but their professional development of them can be enhanced through the process of learning and development.

Measurable Goals and accountability: It is better to have to set the organisational goals with the employees and they must be measurable, actionable, and time bound for that matter. It is opined by Mezhoudi *et al.* (2021) that for developing better goals and the supercharge performance, it needs to use the data that can help to define the objectives with the employees. With the shared drive, each employee must have to know each other's goals and can help them at different time intervals, as they need.

Measure the soft skills objectively: Measuring soft skills have become a valuable entity for a contemporary organisation. As opined by Hazelzet *et al.* (2019), recent research has shown that soft skill training has led to up to 250% of the return on investment based on higher retention and higher productivity so far. For getting the most out of soft skills, training there is the need to measure the performances like resilience and communication objectively. Digital training can deliver highly valued interactive soft skill training in this contemporary situation.

Data to deliver feedback: Using the data could help employers for having better decisionmaking in the management of the employees. According to Lice and Sloka (2019), in a survey, it is found that 28% of the employees are dissatisfied with the frequency of the feedback they receive from the managers so far. However, with databased decision-making, managers could make constructive feedback to the employees. In the meeting with the employees, one manager can take the objective data for the improvement of the performances of the employees so far. Moreover, using technology difficult feedback can become constructive for both parties (Līce, 2018).

Gather Feedback: One of the easiest ways in changing the performances through the data would be a regular survey of the workforce within an organisation. With the following training sessions and the big meeting strategies, smart feedback platforms could be generated for the development of the measurement of the performance of the employees so far. As opined by Young (2022), the best way the leveraging the team's performance is to the tech tools and the data insights at their disposal.

2.4 Evaluations of the relationship between the employability performance and the level of the employee engagement

It is most important to have a strong relationship between employability performance and the level of employee engagement for the success of the organisation. According to Singh (2022), with increases in work management, cognitive and forward-looking behaviours and emotional approaches towards the employees' job performance can be increased. Furthermore, today's world is that of a technological world and with the implications of technological tools, one organisation can understand the employees' working culture and make the environment according to that. Yao *et al.* (2022) argued that the human resource management of organisations must have to take notice of the employees' activities through technologically advanced remote-control software. The active carrying out of the skills and the knowledge training are the factors for the employee's work efficiency improvement and they can make the innovation. Therefore, with training and skills development the employees could understand the strengths and the weaknesses so the employers. On the other hand, the employees' engagement can be increased with the help of the total amount of the complete business for maintaining the performance so far. It is opined by Bolli *et al.* (2018) that in total five factors can make an impact on employee engagement such as attitude, management, health, technology and culture so far. Thus, in the management of employability performance, the leaders within the organisation must have to set the tone for the company's culture. According to Statista Research Department (2022), in a survey in 2021, it is found that 51% of them favoured the work-

life balance as the most valuable factor for work engagement so far. In the earlier career, opportunities and employer ethics were the leading valuable parameters but in the postpandemic, the work-life balance has become one of the leading factors.
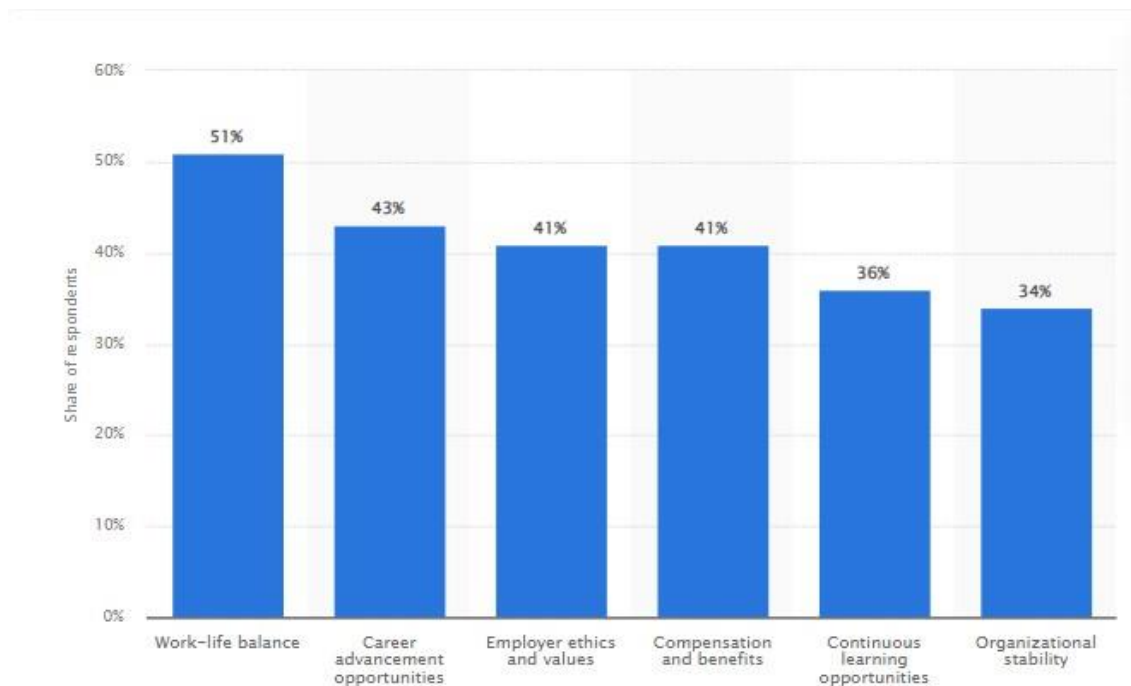

Figure 2: organizational attributes do employees think are most important

(Source: Statista Research Department, 2022)

It is the responsibility of the management to create a suitable employability environment for the employees' engagement for that matter. Each factor of the employees and the working environments must be documented for analysing with the suitable approaches so far. With the right kind of data analysis, suitable employability performance for any particular organisation regarding the employees' engagement could be obtained. In the opinion of Arifin *et al.* (2019), eight factors can affect employee performance so far such as employee well-being, social recognition, environmental design, autonomy, communication, and the perception of the meaning. Commonly, employees want security and rewards regarding their performances. Therefore, in the management of the workplace to a better aspect the goals of the employability environment must be clear for that. Hence, the rewards for the employees must be given based on their performances and the retention rate of the organisation must be high to take on better employee engagement for that matter. Lai *et al.* (2020) argued that motivation must be high among the employees so HR managers should give goals to the employees so that they can try to achieve those goals within the stipulated time. Furthermore, after the setting of the goals, the tracking against the goals must be there for highlighting and identifying the correct employees for having the engagement to the workplaces for that matter. On the other hand, with the development of employees, tracing the problems and the issues of the employees could be understood and the required steps for that employee can be taken by the authorities of any organisation. Therefore, with the implications of the above strategies the employees' engagement in the work of the organisation can be increased so far.

2.5 Improvement of the workforce environment by talent, workforce, and the people analytics

Workforce analytics and planning is the most valuable strategic approach, which defines the process to determine the correct talent, and skilled people for the organisation's work and set the long-range business plan for the firm. Using statistical models and analyse techniques by measuring worker-related data and information to improve the people-related decision and is improved the overall organisation business. As per the research of Tursunbayeva *et al.* (2018), 4 important

ways has been found to improve the workforces planning and people analytics in the workplace such as analysing the performances data to spot talent, making the staffing schedule base on real-time updating, solving the long-term labour and recurring issues and ensure the employees' engagement and satisfaction. Identifying the capability gap among the employees' requirements, up skilling the employees by analysing their individual performances and focusing on training the existing talents will help the workforce for raising the business effectiveness. Improvement of the workforce environment based on the application of people analytics and talent analytics is helping the workforce to improve the recruitment and talent acquisition process in HR management, boosting learning experiences, re skilling and up skilling the employees and improving the employees' retention. It is the opinion of Olsen (2019) that the targeting of sufficient talents for the further planning of workforces, improving the level of productivity and quality of outputs, and identifying the relevant strategies for focusing on people's development could reduce the gap among organisations and employees' performances. Constituting the people analytics defined by the goals set of the organisation through focusing on some domains like multi-source people analytics platforms, organisational network analysis (ONA), pay equity analysis and integrated talent management analysis. From the theoretical learning, it could be analysed that people analytics is the new frontier function to be applied for including the variety in the HR activity and assisting the succession planning for the operations. Workforces will adopt people analytics to provide potential support to the HR managers to isolate the talent for demand and supply dynamic services for setting the benefits and compensation and mapping the talent with business functions. The practice of people analytics and talent analytics in the workforce drive the strategic level creates a better view of cost centres and begins changes in the functions and production of the firm. Gal *et al.* (2020) argue that talent acquisition identifies the attribute to produce a long-term performing employee, selects the candidates who are willing to offer quality work based on saving time and removes bias. Accessing real-time data, improving the employee experiences, which can be inclined to enhance customer satisfaction, gathering vast amounts of information to use the feedback forms, and generating positive performance reviews in the various social media platforms? People analytics is the analysis process of data to manage the employees' performances and reduce the resignation of the employees.

According to Claus (2019), to improve the workforce environment, the firms focus on preventing turnover, saving money by hiring adequate talented employees in the position and supporting internal mobility for the further betterment of the firm. Uncovering trends is one of the important analytics strategies that spot the pattern of easily identifying the talents and utilising the machine learning approaches to produce reports of the overlooked areas. Moreover, that process is associated with recruitment, performance, behaviour, and commute times that provide the sources of quality to reflect in the organisation. Current stages of an organisation focus on the combination of the rates of data availability, talent availability and large players competing in the acquisition. People analytics support the DEIB goals of the organisation by the development of a higher market valuation, producing higher quality intellectual property and greater cultural diversity in the workplace. It is the opinion of Tursunbayeva *et al.* (2018) that following the ethnically diverse outperform process in data analytics will help to track the diversity at all levels of the organisation and maintain the level of management activities by ensuring the progress of the workforce. The improvement of the people analytics and talent acquisition process will allow the company to be more proactive in their business, adding value to the business and enabling them to retain the top performance analytics while maintaining an accurate record of progress in the business. By supporting the internal mobility making impact on the bottom line of innovations, improving diversity, and mapping the internal career of the employees of the firm. Recommended data and information generation will help the employers to inform the decision to every level of employees and reduce the attrition rates of the work by achieving the rate of productivity of the firm.

2.6 Measuring of the employees' skills and knowledge for betterment of organizational goals and strategies

Measuring the effectiveness of the employees through their skills and knowledge, the organisations have adopted some strategies like setting the SMART goals, determining the critical measure, and implementing the changes to find better

outcomes. Comparing the actual achievement against setting the goals, measuring the efficiency of the business areas, functions, and process, and balancing the expenditures against the returns are some significant measuring strategies that the firm uses to measure their firms' effectiveness. It is the opinion of Werdhiastutie *et al.* (2020) that analysing the performance metrics by understanding the process of employees performing their roles, achieving goals, and critical analysis of the potentiality of each of the employees to implement the tasks are important to express the goals success of the organisation. Strategies like being purposeful when the managers communicate effectively to lead the employees, experiencing the concussion of disengagement roles and providing purposeful information to the actionable description to the employees about their responsibilities are important strategies of analytics. For the betterment of the firm, staying goaloriented, establishing explicit goals, and creating a beneficial workflow map for creating a clear vision about the goals are important for the achievement of success. Abbas (2020) pointed out that managing the expectations of the organisation through clear specific objective designing, directions and realistic perspectives will help to generate appropriate success by producing high-quality products through the employees. Measuring the skills and knowledge using tools, providing training sessions for further improvement, and making accountability of priority to keeping the team accountable and meeting the specific standards of improvement of the employees' performances. By providing positive feedback to the employees, the leaders and managers can encourage them to more associate with the work and support them toward better outcomes. Obtainable guidance, receiving a clear vision and working together can make progress in the workplace.

Taouab and Issor (2019) argue that most modern organisations are offering incentives, increments, and promotions to employees for improving their skills and knowledge in the workplace. Measuring the employee's skills and knowledge, most of the HR managers started to gather information, evaluate the work products, and conduct hard skills tests in the workplace every month. Those tactics help the managers and firms to identify necessary skills training and effectiveness of the individual employees. Self-evaluations and quality metrics are two significant measurement processes of employees' skills and knowledge, which invite members of the firms to conduct evaluations of their personal performances and provide perspectives and thoughts on their work. Making conversation and benefits in terms of the employee's development and understanding of the workforce based on a combination of the objective appraisal to give a more comprehensive view among the employees to raise their performance quality based on the discrepancies and similarities among various accounts is important for the measurement. As per the research of Sabuhari *et al.* (2020), using quantity metrics companies measure the employees' performance and the nature of their role to get success in the marketplaces. Quantity matrices provide easy and clear understandable representations, which include using metrics like the number of sales calls made by the individual employee, the number of sales, the number of companies visiting percentage and the percentage of leading the target customer into the sales. Quantitative metrics also provide proof of using the most appropriate and useful business model in the organisation by developing the soft and hard skills and knowledge of the employees. Experts mention that 360-degree feedback is one of the important approaches to employees' skills and knowledge measurement tactics, which builds up the comprehensive picture and describes the process of the employees performing, helps to collect a range of quality feedback from colleagues, presenting direct reports, line managers and from the customers. The general attitude of collaboration and understanding of the strengths and weaknesses of the employees provide individual development programs (Taouab and Issor, 2019). Moreover, providing opportunities to develop and improve their performances based on the analytics will help the employees to be more associated with the organisational goals and strategies and evaluate their performance based on employees' needs and demands achievement. Putting the employees in a radical situation and playing the business game among the employees is another process to measure the employees' effectiveness and raise their skills and knowledge for the further improvement of the firm.

2.7 Recommended strategies of data analysis to know the employee performance and the reasons of resignations

The data-driven approach is the utmost important aspect for any organisation to know its employees from the inside out. Therefore, below some of the points are being given that can be utilised for using data analysis for knowing employee performance and the reason for the resignations.

360-Degree Feedback: It is one of the most essential parts for knowing the employees' performances and their demands from the organisations. Therefore, one organisation must have to think based on the 360-degree feedback from the employees and produce the graphical results of the overall employees' demands from the organisation and their performances as well. In the opinion of Berry (2020), the 360-degree feedback model can help in building up a comprehensive picture of the performances of the employees. Moreover, the collection of a wide range of data on an employee can be obtained from the person's colleagues, customers, and line managers so far. The ranges of the 360 data could help one manager to retain and release the valuable employees for the organisation.

Quantity Metrics: With the help of metrics in gauging, the employees' performances can measure the roles of the success of the organisation. The organisations must have to use descriptive metrics in the data analysis for understanding the employees' performances and the reasons for the resignations for that matter. For example, in some cases, the possible usages of qualitative metrics can provide easy and clear understandable representations of the employee's contributions to the business. According to Serenko (2022), some of the metrics are the number of sales, the number of company visits, the percentage of the leads in converting the sales and the number of sales calls that is being made by the employees. Hence, in this way, the situations of the employees can be understood, and the proper training and development of skills could be provided to the necessary candidates for that matter. Moreover, in this way, the retention rate of the organisation can also be increased so far. Furthermore, Jeffrey and Prasetya (2019) argued that the quantitative metrics could become useful if the business model is being situated based upon the making things and that so far. For example, the matter could be done based on anything from software development to physical products such as items of clothing and other cosmetics for that matter.

Quality Metrics: In the above, the quantity metrics are being developed but the quality metrics are also needed in the development of employee management and the overall structural development so far. Therefore, organisations should take the statistical value measurement in knowing the performance of the employee's productivity and the measurement of the quality, in which they can put output for the organisational growth. Khasasin (2021) argued that the quality metrics would help to introduce a dedicated process for measuring the number of impacts the key products and services could be observed. By doing the data analysis or the statistical approach the data, visualisation dashboards can be formed and from there one business can know about employee performance and the resignation rate within the organisation (Ramlawati *et al.,* 2021). Hence, if the rate of resignation is increasing and the performance of the employees is decreasing from the evidence approach the right causes of the problems must be identified.

Management Appraisal: In employee appraisal management, the line managers could make an impact on the workforce assessment of the landscape for that matter. Each organisation must have to make the reviews to become familiar with the workers. Furthermore, the regular review of the workers can help the HR managers to note down the deviation of the actual processes from the standard one and the risks of redundant and counterproductive measurement could be noted down (Nurdiana *et al.,* 2019). The management-led appraisals can be successful if the usages of the management can be made in the right and simple ways. The management-led decisions could make the value of the business interest and the professional and personal demands of the workforce. On the other hand, the most valuable steps for modernising the performance could be the appraisals of the forward-thinking approach linking with the processes of the organisational goals and the individual goals within the organisation (Reyes *et al.,* 2019).

Self-Evaluation: Encouragement of the evaluation of the performances of the employees by themselves could make valuable interesting insights for that matter. The HR managers and the higher authorities of the organisations should know the perspectives of the employees about themselves. It is opined by Jaillet *et al.* (2019) that it is observed that one employee can become more critical and analytical in evaluating the performances within the organisation. Therefore, the outcome of the self-assessment would provide valuable combinations of the results to the managers of the organisation that matter.

2.8 Literature Gap

The literature review has been conducted with the help of information acquired from the journals, articles and other secondary journal sources that could be collected by the researcher. It is important to understand that despite so many sources, there has been some gap in the literature review that prohibited the attainment of accurate outcomes for the dissertation. The study is about the data analysis of the employee performance and employee engagement in the workplace dealing with the relationship between the employees and their employers as well as the bond employees share with the customers. The gap has been identified in the area where lack of access to the documents led to the limitation of information that could be used for the research. The documents of specific organisations where data analysis has been performed for studying the relationships between employee engagement and satisfaction using effective algorithms are protected under the act of privacy and confidentiality. This area is not exposed much, which has made the information available to be used merely theoretical as access could not be obtained on the practical data analysis documents.

2.9 Conceptual Framework

The conceptual framework has been designed focusing on the aspects that have been covered in the literature review effectively. The framework has discussed about the need for data analysis to evaluate the employee engagement and employee performance in the organisations. Furthermore, the importance of data analysis of employee performance has led to the need for optimisation of onboarding to enhance learning methods and develop soft skills among the employees to improve their performance levels. Furthermore, the framework has discussed about the importance of attaining employee engagement based on the work life balance for engaging and retaining the employees along with providing them with effective benefits and compensation to recognise their talent in the workplace.
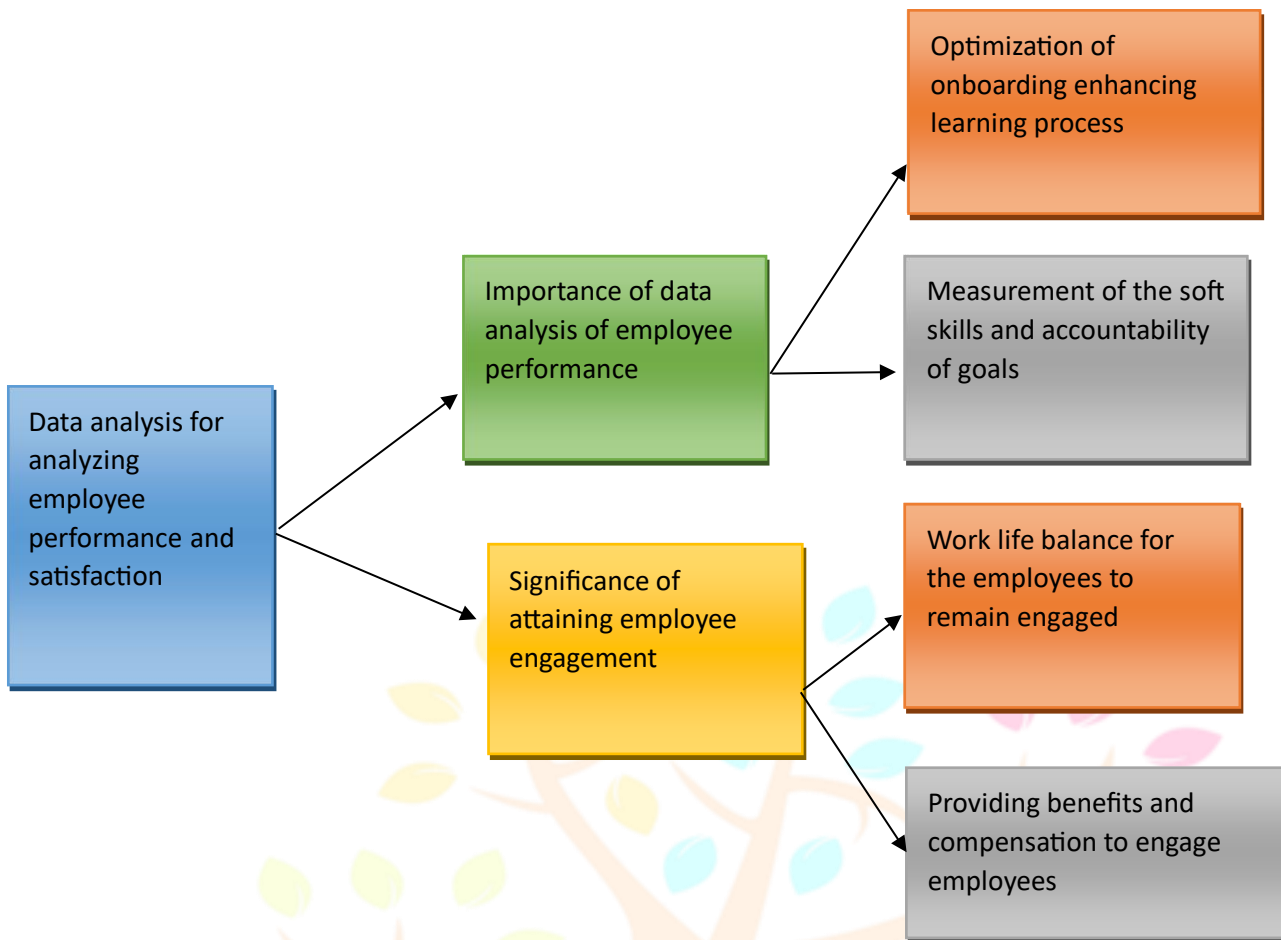
2.10 Summary

This chapter has summarised that it is the responsibility of the management to create a suitable employability environment for the employee engagement within the workplace. The factors have been discussed that help in making the employees working in the firm satisfied with the work environment and provide their hard work to achieve the business goals. The chapter has discussed about the eight factors that can affect employee performance so far such as employee well-being, social recognition, environmental design, autonomy, communication, and the perception of the meaning effectively. It has been discussed that the employees should be provided appropriate talent programs to improve their skills as that would help them in maintaining their performance in the organisation. The use of performance feedback machines would help in understanding the issues with the employees and the improvements needed in them. It has been discussed that the employees want security and rewards regarding their performances. The employees should be provided effective benefits and compensation for their hard work and performance to retain them in the company.

CHAPTER 3: METHODOLOGY AND RESULTS

In this project, we are going to conduct an analysis related to the attrition of employees from an organization. There are numerous feature variables present in the dataset and the target variable in the dataset is Attrition which helps us to understand whether a particular employee has left the organization or not. The machine learning algorithms which we are going to use to predict the Attrition of employees are K nearest neighbour ML algorithm, Logistic Regression ML algorithm, Gaussian Naive Bayes ML algorithm, Decision Tree ML algorithm, and Random Forest ML algorithm. The distribution of the target variable is drawn using a count plot which is shown below:
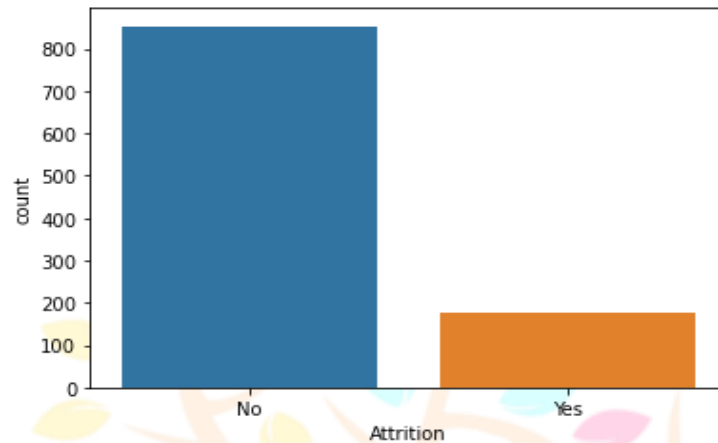
The above plot indicates that the number of employees for whom attrition has taken place is less compared to the number of employees for whom attrition has not taken place. The correlation plot of the dataset is given below:
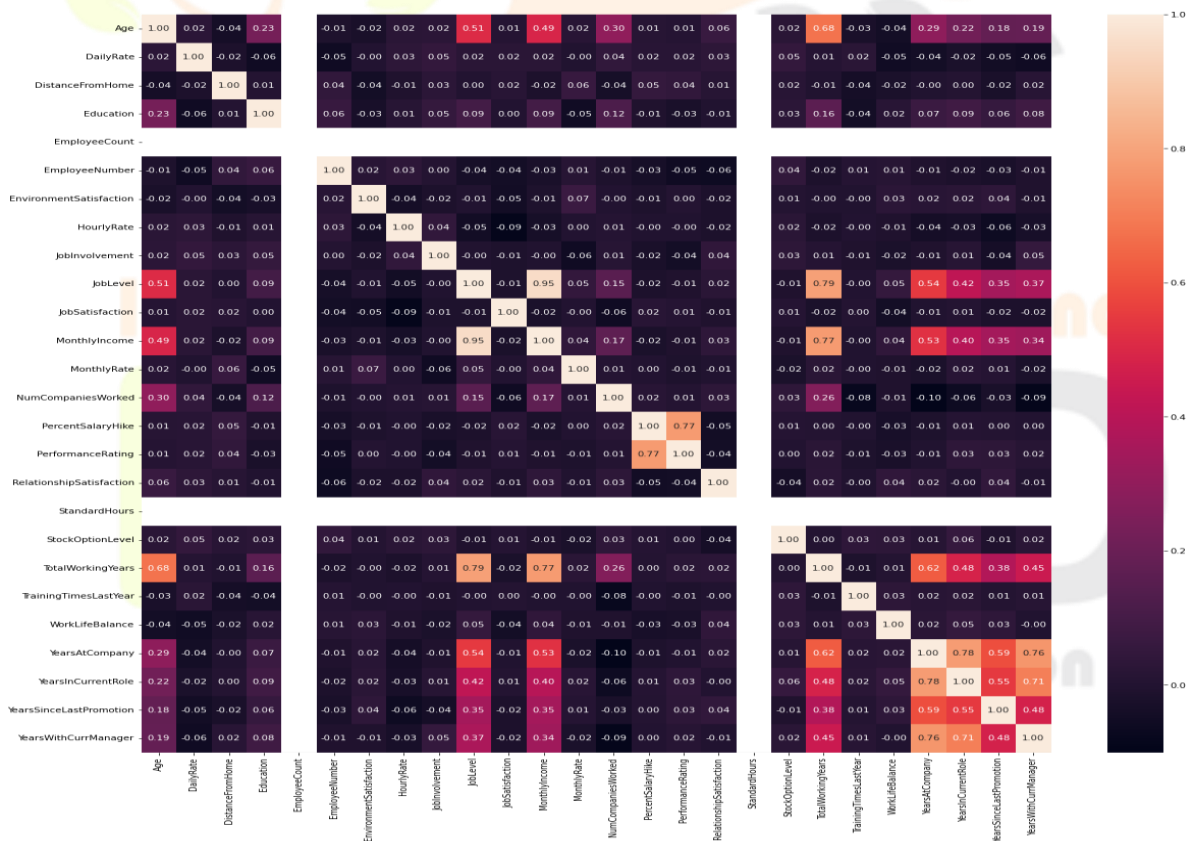
The variables which have a strong correlation between each other is shown using the dark coloured boxes and the light-coloured boxes indicated a weaker correlation between 2 variables. For proceeding with the analysis, we have converted the target variable from a categorical to a numeric variable. There were certain feature variables present in the dataset which were categorical in nature, and they cannot be directly implemented in the machine learning algorithms. We must convert these variables into dummy variable such that they can be implemented in the machine learning algorithms. The variables are Business Travel, Department, Education Field, Gender, Job Role, MaritalStatus,Over18,and Over Time.

In the next step, we would be splitting the values of the dataset using the feature and target variables into training data and test data respectively. The training data would be primarily used to train the different ML algorithms and the test data would be primarily used to check the strength of the different ML algorithms. We would replace the null values present in the dataset with a 0.

The first machine learning algorithm to be used is the K nearest neighbour ML algorithm. The output of this algorithm is shown below:

K nearest neighbour ML algorithm accuracy score equals: 0.810077519379845

K nearest neighbour ML algorithm Mean Absolute Error equals 0.18992248062015504

K nearest neighbour ML algorithm Root Mean Squared Error equals: 0.4358009644552832

K nearest neighbour ML algorithm R-squared value equals: -0.25416666666666643

The accuracy of a particular ML algorithm represents the capacity of that model to correctly forecast the value of the target variable. Using the employee attrition dataset, the K nearest neighbour ML algorithm can predict the target variable with an accuracy which is equal to 0.81. The error estimates of the K nearest neighbour ML algorithm given by the Mean Absolute Error and the Root Mean Squared Error represents the variance between the original values of the test data and the forecasted values of the target variable and these estimates should be lowered to train a more accurate model. The R-squared score which indicates the goodness of fit of a model should also be higher to train a more accurate model. The confusion matrix of this ML algorithm is shown below:

The confusion matrix makes it evident that the sum of True Negatives of this ML algorithm is equivalent to 205 and the sum of True Positives of this ML algorithm is equivalent to 4. The sum of False Positives which represents the Type I error is equivalent to 5 and the sum of False Negatives which represents the Type II error is equivalent to 44.

The second machine learning algorithm to be used is the Logistic Regression ML algorithm.
The output of this algorithm is shown below:

Logistic Regression ML algorithm accuracy score equals: 0.813953488372093
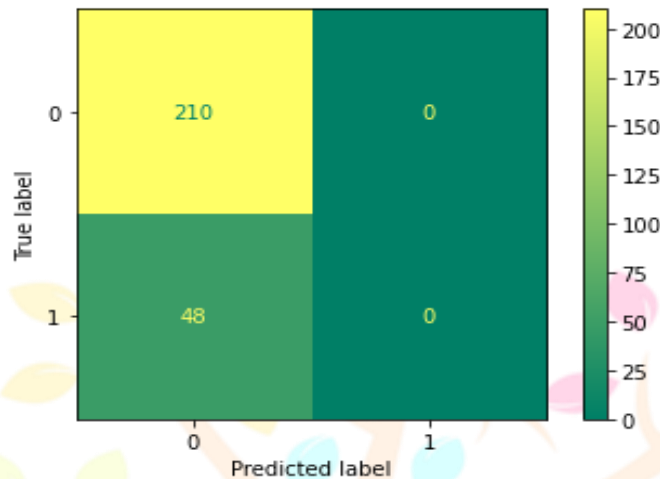
Logistic Regression ML algorithm Mean Absolute Error equals 0.18604651162790697

Logistic Regression ML algorithm Root Mean Squared Error equals: 0.43133109281375365

Logistic Regression ML algorithm R-squared value equals: -0.22857142857142843

The accuracy of a particular ML algorithm represents the capacity of that model to correctly forecast the value of the target variable. Using the employee attrition dataset, the Logistic Regression ML algorithm can predict the target variable with an accuracy which is equal to

0.8140. The error estimates of the Logistic Regression ML algorithm given by the Mean Absolute Error and the Root Mean Squared Error represents the variance between the original values of the test data and the forecasted values of the target variable and these estimates should be lowered to train a more accurate model. The R-squared score which indicates the goodness of fit of a model should also be higher to train a more accurate model. The confusion matrix of this ML algorithm is shown below:

The confusion matrix makes it evident that the sum of True Negatives of this ML algorithm is equivalent to 210 and the sum of True Positives of this ML algorithm is equivalent to 0. The sum of False Positives which represents the Type I error is equivalent to 0 and the sum of False Negatives which represents the Type II error is equivalent to 48.

The third machine learning algorithm to be used is the Gaussian Naive Bayes ML algorithm.
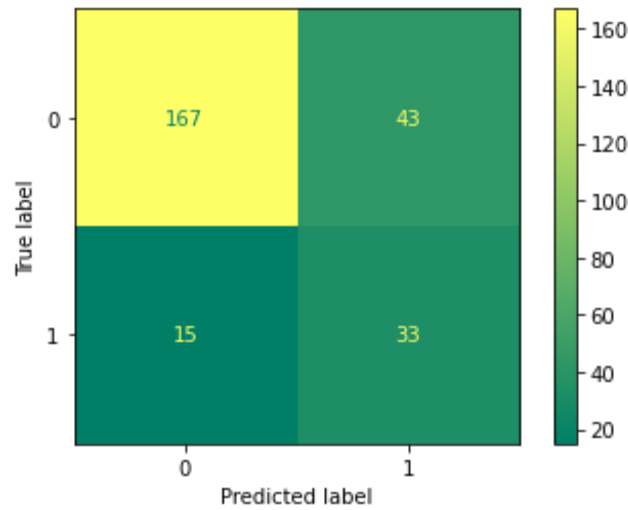The output of this algorithm is shown below:

Gaussian Naive Bayes ML algorithm accuracy score equals: 0.7751937984496124

Gaussian Naive Bayes ML algorithm Mean Absolute Error equals 0.2248062015503876

Gaussian Naive Bayes ML algorithm Root Mean Squared Error equals: 0.47413732351544274 Gaussian Naive Bayes

ML algorithm R-squared value equals: -0.48452380952380936

The accuracy of a particular ML algorithm represents the capacity of that model to correctly forecast the value of the target variable. Using the employee attrition dataset, the Gaussian Naive Bayes ML algorithm can predict the target variable with an accuracy which is equal to 0.7752. The error estimates of the Gaussian Naive Bayes ML algorithm given by the Mean Absolute Error and the Root Mean Squared Error represents the variance between the original values of the test data and the forecasted values of the target variable and these estimates should be lowered to train a more accurate model. The R-squared score which indicates the goodness of fit of a model should also be higher to train a more accurate model. The confusion matrix of this ML algorithm is shown below:

The confusion matrix makes it evident that the sum of True Negatives of this ML algorithm is equivalent to 167 and the sum of True Positives of this ML algorithm is equivalent to 33. The sum of False Positives which represents the Type I error is equivalent to 43 and the sum of False Negatives which represents the Type II error is equivalent to 15.

The fourth machine learning algorithm to be used is the Decision Tree ML algorithm. The output of this algorithm is shown below:
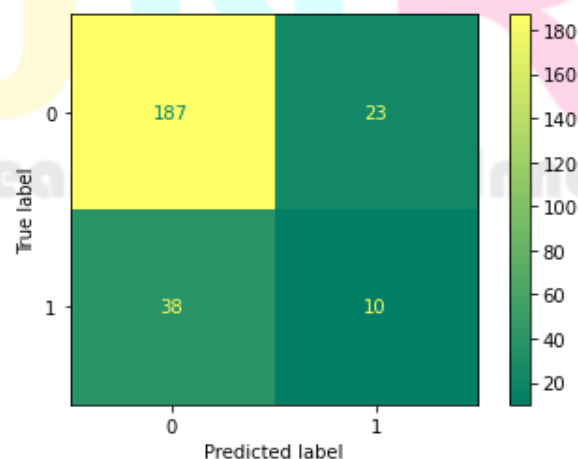
Decision Tree ML algorithm accuracy score equals: 0.7635658914728682

Decision Tree ML algorithm Mean Absolute Error equals 0.2364341085271318

Decision Tree ML algorithm Root Mean Squared Error equals: 0.4862449059138119

Decision Tree ML algorithm R-squared value equals: -0.5613095238095236

The accuracy of a particular ML algorithm represents the capacity of that model to correctly forecast the value of the target variable. Using the employee attrition dataset, the Decision Tree ML algorithm can predict the target variable with an accuracy which is equal to 0.7636. The error estimates of the Decision Tree ML algorithm given by the Mean Absolute Error and the Root Mean Squared Error represents the variance between the original values of the test data and the forecasted values of the target variable and these estimates should be lowered to train a more accurate model. The R-squared score which indicates the goodness of fit of a model should also be higher to train a more accurate model. The confusion matrix of this ML algorithm is shown below:

The confusion matrix makes it evident that the sum of True Negatives of this ML algorithm is equivalent to 187 and the sum of True Positives of this ML algorithm is equivalent to 10. The sum of False Positives which represents the Type I error is equivalent to 23 and the sum of False Negatives which represents the Type II error is equivalent to 38.

The fifth machine learning algorithm to be used is the Random Forest ML algorithm. The output of this algorithm is shown below:
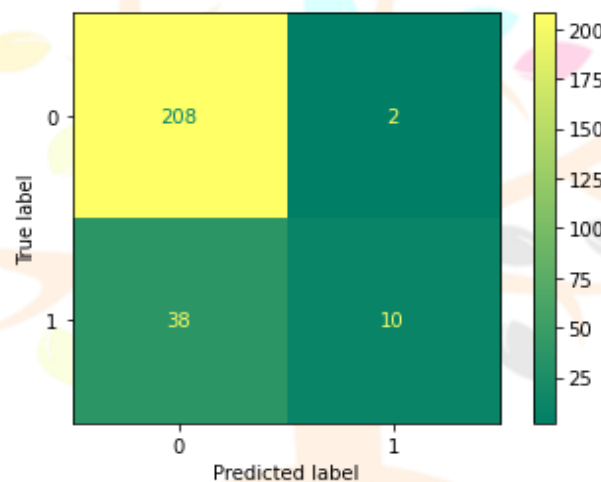
Random Forest ML algorithm accuracy score equals: 0.8449612403100775

Random Forest ML algorithm Mean Absolute Error equals 0.15503875968992248

Random Forest ML algorithm Root Mean Squared Error equals: 0.3937496154790789

Random Forest ML algorithm R-squared value equals: -0.023809523809523725

The accuracy of a particular ML algorithm represents the capacity of that model to correctly forecast the value of the target variable. Using the employee attrition dataset, the Random Forest ML algorithm can predict the target variable with an accuracy which is equal to 0.8450. The error estimates of the Random Forest ML algorithm given by the Mean Absolute Error and the Root Mean Squared Error represents the variance between the original values of the test data and the forecasted values of the target variable and these estimates should be lowered to train a more accurate model. The R-squared score which indicates the goodness of fit of a model should also be higher to train a more accurate model. The confusion matrix of this ML algorithm is shown below:

The confusion matrix makes it evident that the sum of True Negatives of this ML algorithm is equivalent to 208 and the sum of True Positives of this ML algorithm is equivalent to 10. The sum of False Positives which represents the Type I error is equivalent to 2 and the sum of False Negatives which represents the Type II error is equivalent to 38.

CHAPTER 4: ECONOMIC AND COMMERCIAL CONTEXT

4.1 Software tools and techniques used in the research

The research has used the Python programming language for developing the algorithms and acquiring the required outcomes. The NumPy is the library present in the Python programming language that adds support for the large and multidimensional matrices and arrays. It is responsible for supporting the large collection of high-level operations and functions of mathematics as well for operations on the arrays effectively. Furthermore, the Sklearn is considered as the most useful library for machine learning in the Python language. It comprises of the efficient tools important for the machine learning as well as the statistical modelling comprising of regression, classification, dimensionality reduction and clustering appropriately. Moreover, the Pandas is the software library developed in the Python programming language for the manipulation and analysis of the data. It has been offering the data structures and operations that are responsible for manipulation of the time series and numerical tables effectively. The Pandas are responsible for providing flexible, fast, and expressive data structures that have been designed focusing to work with labelled and relational data, which is easy and intuitive. Furthermore, the Matplotlib is the comprehensive library important to create animated, static, and interactive visualisations especially in Python. It is known for providing object-oriented API to embed the plots in the applications with the help of general-purpose GUI toolkits such as GTK.

4.2 Thematic Analysis

4.2.1 Employability performances in the organisation: Evidence from big international companies

Industrial data has been shown in the report, which has represented the designing of performances of the management based on the presentation of goal setting evaluations, incentives and rewards setting and steering the benefits of the top to the bottom position of the organisation. Based on the last 5 years' data and information it could be found that 79% of executives rate high priority on picking up their speed and 71% of executives are following the current trends to boost the performances of the employees (Deloitte, 2022). The collected data shows that the impact of the new performances praises the workplaces is very high. 90% of the companies are redesigning their performance management to direct the improvement and find 96% of the employee engagement in the firms. From the report of the performance management revolutions, it could be analysed that ongoing transformations and business strategy, revaluating the aspect of programs, and using the different software tools are raising more than 87% of the performance growth of the companies in the worldwide position. Based on the 2015 data set the global human capital trends research is showing better evolutionary strategies in the performance measurement that is mentioned among 82% of growth in the business firms. 45% of companies at the global level believe that the performance evaluation did not motivate the employees whereas 41% of companies are focusing on evaluating the individual employees' employability performances to raise the development of the business (Deloitte, 2022). The big IT companies are operating the network team process, shifting the strategic positions, and focusing on providing positive feedback to achieving the performance quality of the employees. In this digital era, 88% of companies are using regular discussion facilities to enhance the knowledge and skills of the employees and 72% of companies are focusing on the learning skills of the employees, which ensure the adopting nature and creating skills of the employees by improving the productivity and performance quality of the firm. Promotions of innovative discussion in the workplaces raise the efficiency of the employees across 79% of the big organisations such as Patagonia, IBM, GE Cisco and so many other companies empower their employees and build better quality relationships in the workplaces through the development of the data analysis process. From the data sources report Deloitte (2022), it can be found that the employability performances metrics have achieved business success by improving the efficiency rate and quality of each individual employee, associated with more improvement by using the significant applications and raising the keys of the analysing process for improving the employability performances.

4.2.2 Based on the evidence of intentional firms improving the workforce environment
by the definition of workforce analytics, talent analytics and people analytics

Based on the international industrial evidence and the annual report of the big international firms, the talent analytics approaches, workforce analytics process and people analytics process are important that increasing their companies' share and capital by more than $2.2 million in the year of 2016 to 2021. 26% of companies are focusing on the award promotions process, 28% of differentiation is based on compensation performances and 13% of companies share positive feedback with the other employees. Get in touch Marc Solow Managing Director (2021) report pointed out that focusing on the tactical technological analytics insights to action in DEI, big four accounting progress is helping the firms to realise the needs of the new journey based on making analysis among the employees which increases the productivity rate more than 78%. 2021 data showed that workforce analytics build 47% of trust among the employees and transparency in the workplace to handle the overall workloads and reduce the chances of failures among 67%. This data also mentioned that by adopting the talent analytics and people analytics process in the business model will help the organisation to participate in the active data-driven culture which raises the productivity and performance rate of the organisation by more than 77%.
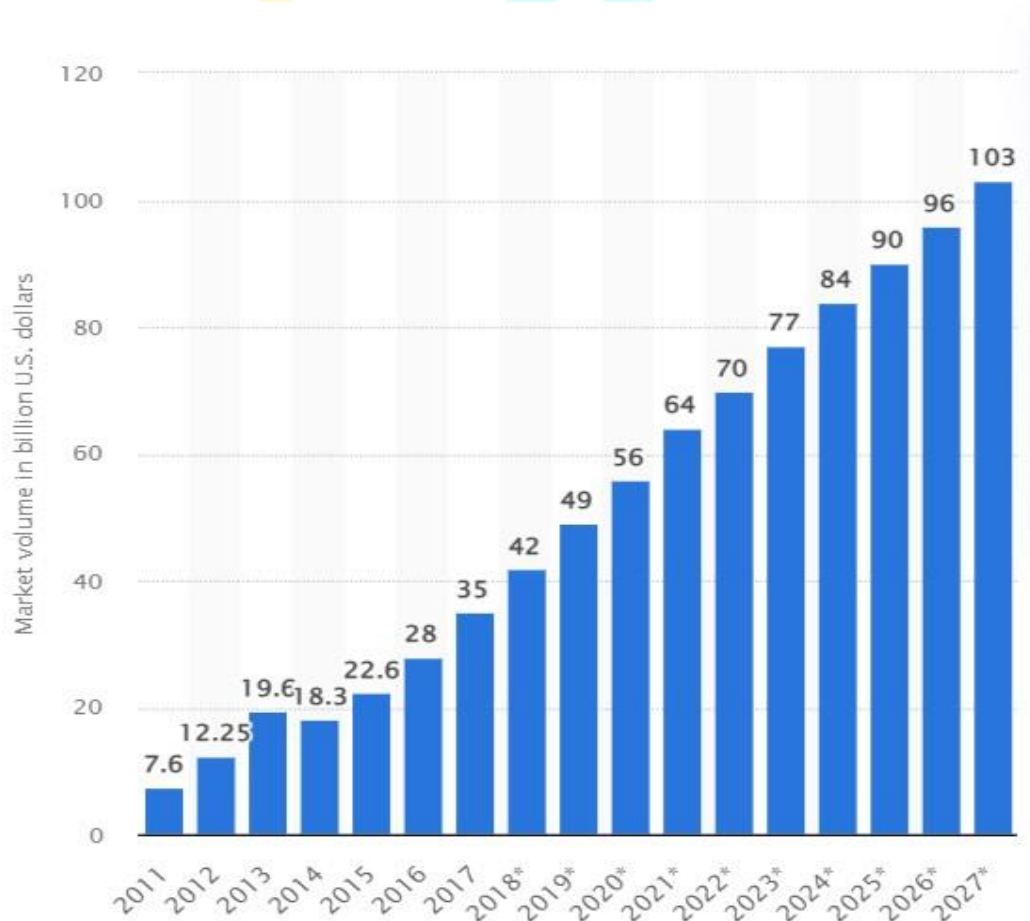

Figure 3: Big data market size based on the revenue forecasts worldwide from 2011 to 2027

(Source: Statista Research Department, 2022)

According to the report of Statista Research Department (2022), it has been found that the global big data market is forecast to grow up to 103 billion US dollars by 2027 by developing the workplaces and people analytic process in their business. This data also showed that the maximum companies are raising double revenue expectations in market size in 2018 than 2011. 45% of shares are depending on the software segment which would depend on the larger data market activities.

In the last 5 years, data and information of the big IT industry are showing significant growth in their operation due to the implementation of workforce analytics, people analytics and talent analytics process in their business. Accelerate using

innovative technology is evolving with rapid growth, offers the tantalising wealth of the ranging and capabilities of the modern firms across 67% and raises the investment by more than 70% by using several analytics tools and measurement techniques in the business (Get in touch Marc Solow Managing Director, 2021). People analytics software and tools are associated with 50% of the plans for higher performance and growth, driving insights into business values through the usage of the people analytics process and helping the company to achieve better business outcomes which can also provide meaningful changes in the firm. The practical evidence and data of the big IT institutions like Wipro, TSC and IBM have been shown that the robustness of the analytics of platforms will increase the well-being among 44% and generate more holistic insights in the business operations. Further data shows that the powerful workforce's analytics have developed 66% of the collaborations in the organisation, which creates a positive environment in the business corporations, identifying the optimal patterns of innovation, productivity, and team working and showing the best mix onsite view in the firm (Get in touch Marc Solow Managing Director, 2021). Analytics of the talent acquisition will provide better integration of analytics, find the richer sources in the business, and confirm the high-quality performance for the international synchronisation activist in the international firms.

4.2.3 Present the numerical data based on the measurement of employees' skills and knowledge for the betterment of the organisation's goals

HR managers of big IT or business organisations are using some significant metrics in their business to measure the employee's skills and individual knowledge about the work and ensure the success of the project. Statista Research Department (2022) reported that 82% of HR managers are said that measure the employees' engagement process, retention, and total turnover rate the firms measured the employees' skills which are mentioned in the 45% of rating in the organisations. 56% of HR managers are focused on the voluntary turnover rate and talent turnover rate to measure the effectiveness and measuring the performance of the employees. Out of 10 of managers, 5 of them are using the graphic rating scale approach to measure the employee's skills which focuses on raying the employee's relative performance areas, scaling the rate of understanding the tasks, behavioural scale, and frequency level of each of the individual employees. 38% of HR managers are focused on 360-degree feedback to account for the system tasks, measure the employees' skills and performances and look after the people circle that includes survivors, co-workers, and many other people. 56% of organisations at the international level that are in a better position of the worldwide rate are focusing on the selfevaluation process to identify the employees' particular skills and identify the changes that the employees need to develop their performance quality for the future. In this data, it could be found that comparing the objective of appraisal with the self-evaluations will help the big international organisations to generate $3.44 million in revenue in their business in 2021, where the companies are generating $2.41 billion in revenues in the year of 2017 (Hartford report, 2022). Further study of the measurement of numerical data and information on the employees' skills and performances level will be represented that in this modern era, 63% of companies are using the management by objectives (MBO) measurement process in their business to identify the core skills, expectations, participating quality and ensure the foster communication strategy in the business. Identifying the skills gap between theoretical applications and practical applications will help the organisations to provide the necessary training and arrange special development programs in the workplaces which are helping to maximise employability by more than 74% and helping the employees to understand the different types and roles of themselves.

Hartford report (2022) also presented a report which showed that the best approaches to measuring skills are providing performance reviews, tapping the current solutions, and using certain programming languages and software tools in the firms to scrape the employees' profiles. 34% of organisations are responding that conducting the hard skills test among the employees, evaluating their work products, and tricking the scale by building the work assessments by providing regular feedback the big firms are raising the capital investment strategies and business keys in the worldwide market.

4.2.4 Benefits of data analysis to analyse the performances of the big international organisation: Evidence of the last 10 years
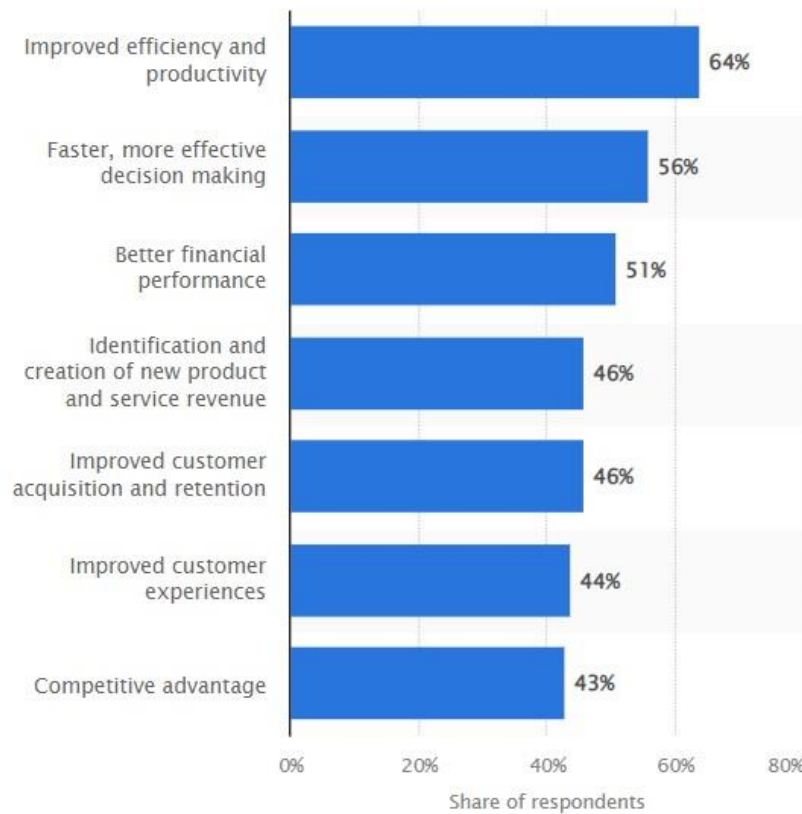

Figure 4: Top benefits for the companies through the application of analytics tools worldwide as 2019

(Source: Statista Research Department, 2022)

Statista Research Department (2022) reported that analytics processes improve the efficiency and productivity rate by 64%, faster and more effective decision-making process by 56% and provide better financial performances by 51% in 2019. This data also represents that people analytics workforce's analytics are helped international organisations to identify and create new product and service revenue across 46% in the last 5 years. By developing and improving the customer retention rate and acquisition by more than 46%, the firms ensure their market success and develop consistent growth in the outer world. Thus, the analytical approaches improved the customers' experiences by more than 44% by developing the skills and quality of each individual employee in the workplace. The efficiency rate and product quality are significant keys that depend on the development of the people analytics process and identifying the core skills and talented employees for the workplace. Columbus (2018) data showed that worldwide big data market revenues for services and software are projected to increase from $42 billion in 2018 to $103 billion in 2027. By attending and focusing on the usage of more analytics tools and process in the business model, the international big organisations are the compound annual growth rate of 10.55% according to Wikibon. According to Accenture information, it could be highlighted that the company's executives have agreed that the company is embracing the big data analytics process and raising the rate of their competitiveness across 79% and completing 83% of big data projects in the competitive edge which is improving the workplace loads. In the present day, the worldwide big data market revenue has been increasing and showing faster growth in the business. 14% of growth in the business and the software market is forecasting the worth among $628 billion and developing the research and development and operations management activities. The McKinney analytics study has presented that the overview of analytic technology is enabling an entirely new ecosystem in the business and the foundational technology will increase the valuable contribution of the business (Columbus, 2018). Nearly 50% of modern technological organisations are focusing on the adoption of the analysis process to mankind the fundamental changes in their business and measure their employees' effectiveness by identifying the strengths and weaknesses of each individual

employee through the analytic process. Tools and materials of the analytics process control the greater number of functions in the business model and develop the transformation system by getting a better number of returns in the business in the last 10 years.

4.2.5 Present the further improvement strategy of data analysis for the development of the big international firms within 2030

There is need for advancements in the use of data analysis by big firms for employee management. The existing use of Analytics need to be enhanced by the tying the performance metrics with the advanced analytics. One of the ways in which the strategy of using data analysis in employee performance management can be enhanced in future practices it is investment in automation. Automated system can be developed that will use the Data Analytics for analysing the employee performance. The analytics can be used for using existing data on various areas such as task completion for understanding the misalignment in the workflow (Partners, 2022). Moreover, software bots can be implemented for automation of data gathering on the simple task in which employees are engaged for daily monitoring of the employee performance.

Furthermore, according to recent studies there is growing significance of people analytics using advanced technologies for employee and performance management. People analytics can replace the Pacific employee data like the email pattern, keystroke capture, login hours and website visited. With the use of the People Analytics, it can be easier to detect the performance of the employees and to check if they are being overwhelmed with their allotted duties. This can be analysed by means of checking the regular work hours, work prioritisation, employees missing critical deadlines for failing to deliver the high value projects (Pattyrn, 2022). With the use of people analytics, it will be possible to use interventions for enhanced work processes like the manager scan label the high priority task for refocusing the workforce. According to a recent report, 71% companies have stated that they are considering people analytics as a high priority for data gathering on the employees and employee management (Fineman, 2017).

Digital Communications has been identified to be the present and future communication for employee engagement and performance management. The use of the secured group messaging system has been identified to be a tool for developing a full suite of tools of digital communication for running digital workplace. Such tools can anyone secure messaging and enhance the internal communication system. This will also enable communication in real time and all the employees will be communicated through operational and organisational communication features from the 1:1 the messaging to group chats (Duvigneau, 2022). This will facilitate collaboration among the employees and will also help to keep tab on the information being shared between the employees that can be a source of understanding the employee concerns based on the information shared. For the future improvement there can also be advancement in the use of AI algorithms such as in the form of workforce analytics. By using workforce analytics database Intelligence can be used for improving and handling decision-making on employees and can also enable hiring of top talent and align compensation with performance (Wallask, 2022). It can leverage big data for making informed decisions and predictions on the employees in the workplace. Workforce analytics can help to optimise the data available on the employees through data collection and arrange and transfer it for informing the HR decisions.

4.2.6 Data presentation for measuring the importance of analysis of data of employee performances and resignation in the big IT firms

Meaning of the big IT firms today are analysing the potential of Data Analytics and other advanced technologies to leverage the potential of big data and predictive analytics to measure the risk of employee resignation. For instance, IBM is one of such organisations that have used HR analytics and attrition dashboard to analyse employee performance and identify risks of resignation. The company had created a Tableau dashboard that suggests the use of descriptive, diagnostic, predictive and prescriptive Analytics irrespective of where the company falls on the maturity model analytics.

Figure 5: use of descriptive analytics for employee data gathering

(Source: Khan, 2022)

The descriptive HR analytics has been applied that has helped to uncover insights such as gathering information on the demographics and characteristics of the organisations (age, gender, number, and employee foreground). The KPI has revealed the number of employees that the organisation has and the average age of the employees being 37 and the attrition rate has been observed to be 16.12%. Results can also be understood from the recent survey regarding the department satisfaction that has revealed that the average satisfaction is 2.72/4 that is lower than the average.

Tech Giants such as HCL has resolved the attrition problem by using advanced technologies such as AI/ML tools and gamification for tracking and addressing the level of dissatisfaction among employees related to work (Gautam, 2022). This has helped the company to analyse the areas of focus for increasing employee retention freshers on boarding and training practices.
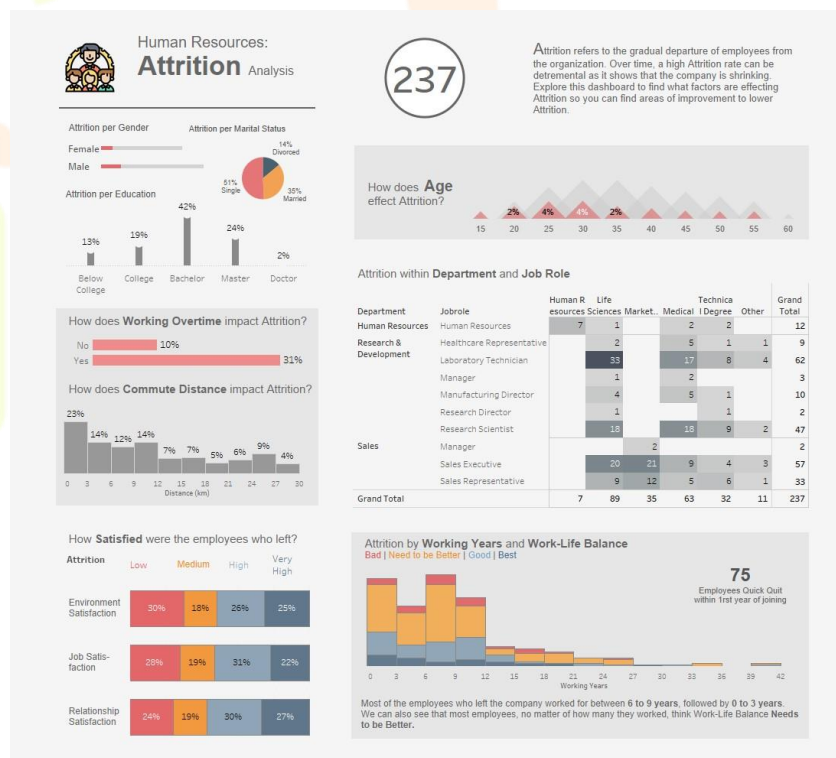

Figure 6: use of diagnostic analytics

(Source: Khan, 2022)

The performance of the diagnostic analytics on the attrition has revealed that there is high attrition rate in the organisation. The diagnostic model had also helped in identifying the highrisk employees that create the risk of high turnover in the organisation. By using the model, the attrition rate can be predicted on turnover can be prevented with 3 x efficiency and this can further help in saving the cost from attrition in the organisation. The model had been helpful in identifying the employees working overtime, job satisfaction in frequent travelling of the employees as key factors for the high employee turnover. The employees that are working overtime are 5 times more likely to quit the job. The actionable insights from such findings can be included for improving the moral of the employees in the HR department and create initiatives for improving work life balance and evaluating travel occupations.

Many IT firms are also using turnover calculator for calculating the probability of the potential turnover by giving statistical important information in employee as input in the calculator. By calculating the turnover using the turnover calculated there had been cost saving from high rate of attrition as the cause of attrition is identified and addressed.

CHAPTER 5: CONCLUSION

5.1 Summary

This chapter has discussed the analysis of data on employee performance and resignation appropriately. It has been summarised that the data analysis is the process, in which one can apply statistics or other logical techniques for describing, illustrating, and evaluating any data set. The data analysis has some tools through which they can analyse the past or future to make decisions effectively. It has been discussed that optimisation of onboarding is the first opportunity of the company for taking the performance baseline for the new employees. Furthermore, the best approach for management of the onboarding is the development of low stakes testing in the processes. The organisational goals should be set with the employees for super charging their performance. The presence of a strong relationship should be present between the level of employee engagement and the employability performance effectively. It has been discussed that human resource management of the companies should be taking the notice of the activities of the employees using advanced technological software for remote controlling. It has been evaluated that the workforce analytics and planning are important for making the valuable strategic approach defining the process for determining the correct talented and skilled workforce for the organisation.

It has been analysed that the identification of capability gap among the needs of the employees should be studied along with the discussion on the real time solving of long-term labour and recurrence of issues ensuring the engagement and satisfaction of the employees. It has been discussed that the uncovering of trends is considered as one of the important analytics strategies that spot the pattern of easily identifying the talents and utilising the machine learning approaches to produce reports of the overlooked areas. Moreover, that process is associated with recruitment, performance, behaviour, and commute times that provide the sources of quality to reflect in the organisation. The research has discussed about the current stages of an organisation focus on the combination of the rates of data availability, talent availability and large players competing in the acquisition. People analytics through the DEIB goals of the organisation by the development of a higher market valuation, producing higher quality intellectual property and greater cultural diversity in the workplace effectively. These data have been obtained from the analysis of secondary sources in the literature review chapter of the dissertation to obtain effective outcomes answering the research objectives.

5.2 Recent studies on the research topic

The current research available has focused on the ongoing trends of using advanced technologies in the business operations for obtaining effective outcomes. It has been discussed that employee engagement is important for an organisation to understand the role of the workforce in the organisation based on which the decisions are taken for the performances in the firm. Employee engagement is important for improving the feelings and emotional attachment of the employees with the organisations. Furthermore, it has been obtained from the current research that employees recruited

for the company should be talented and skilled to handle the complicated situations and deal with the conflicts taking place in the workplace. It has been obtained that employee engagement is important for the companies for having effective strategies that would help with the creation of better and more effective work culture, reduction in the staff turnover, increasing the productivity and building better work relationships with the customers affecting the organisational profit margins. Employee satisfaction is the need for making the employees working in the company content with the services and treatment of the employers. It is important to provide better opportunities to the employees and make them feel needed in the firm. The satisfaction levels of the employees should be monitored to help understand their skills in the company and retain them effectively.

5.3 Comparison of current study with project research

In this project, it has been discussed that the satisfaction level of the employees is important for understanding the level of contentment in the workplace. The employees should feel satisfied in the workplace to understand that their opinions and decisions matter in the organisation. Furthermore, this research has discussed about the big IT companies operating the network team process, shifting the strategic positions, and focusing on providing positive feedback to achieving the performance quality of the employees appropriately. The current studies have discussed about the HR managers of big IT or business organisations using some significant metrics in their business to measure the employee skills and individual knowledge about the work and ensure the success of the project. Comparatively, it has been discussed in the project that it is important to implement talent management programs for the employees working in the firm. These programs help in motivating the employees by polishing their existing skills and helping them learn new skills as well. These factors have played important role in recognising the efforts and work performance of the employees. The current studies have focused on the feedback programs that should be followed in the organisations for monitoring the employee performances in the firm. It has been discussed that the employees should be treated with dignity and respect their decisions to make them satisfied and content in the workplace effectively.

The research project has directed that employees should be taught new skills to help them improve their performance in the companies and in turn, influence the organisation's attainment of productivity. Comparatively, the current trends of research circle around the 360-degree feedback method that helps in monitoring the performance of the employees. The positive and negative side of the employees are analysed based on which their performance is judged in the company. It has been obtained from the current studies comparatively that the best approaches to measuring skills are providing performance reviews, tapping the current solutions, and using certain programming languages and software tools in the firms to scrape the employee profiles. This project has discussed about the McKinney analytics study that presented the overview of analytic technology enabling an entirely new ecosystem in the business and the foundational technology is considered to increase the valuable contribution of the business appropriately.

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APPENDICES
[2] In

```python
#Importing libraries
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.naive_bayes import GaussianNB
import matplotlib.pyplot as plt
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import classification_report, confusion_matrix,accuracy_scor
import plotly.graph_objects as go
from plotly.subplots import make_subplots
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestClassifier
from sklearn.tree import DecisionTreeClassifier
import seaborn as sns
from sklearn.neighbors import KNeighborsClassifier
```

In [71]

```python
#Importing data
attrition_data=pd.read_csv(r"C:\\Remin\Employee_Attrition.csv")
```

In [72]

```python
#Information about the dataset
attrition_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1029 entries, 0 to 1028
Data columns (total 35 columns):
 #   Column                   Non-Null Count   Dtype
---  ------                   --------------   -----
 0   Age                      893 non-null     float64
 1   Attrition                1029 non-null    object
 2   BusinessTravel           1024 non-null    object
 3   DailyRate                1002 non-null    float64
 4   Department               1029 non-null    object
 5   DistanceFromHome         934 non-null     float64
 6   Education                1029 non-null    int64
 7   EducationField           1029 non-null    object
 8   EmployeeCount            1029 non-null    int64
 9   EmployeeNumber           1029 non-null    int64
 10  EnvironmentSatisfaction  1029 non-null    int64
 11  Gender                   1029 non-null    object
 12  HourlyRate               1029 non-null    int64
 13  JobInvolvement           1029 non-null    int64
 14  JobLevel                 1029 non-null    int64
 15  JobRole                  1029 non-null    object
```

```
16   JobSatisfaction            1029 non-null    int64
17   MaritalStatus              1024 non-null    object
18   MonthlyIncome              1029 non-null    int64
19   MonthlyRate                1029 non-null    int64
20   NumCompaniesWorked         1029 non-null    int64
21   Over18                     1029 non-null    object
22   OverTime                   1029 non-null    object
23   PercentSalaryHike          1029 non-null    int64
24   PerformanceRating          1029 non-null    int64
25   RelationshipSatisfaction   1029 non-null    int64
26   StandardHours              1029 non-null    int64
27   StockOptionLevel           1029 non-null    int64
28   TotalWorkingYears          1029 non-null    int64
29   TrainingTimesLastYear      1029 non-null    int64
30   WorkLifeBalance            1029 non-null    int64

31   YearsAtCompany             1029 non-null    int64
32   YearsInCurrentRole         1029 non-null    int64
33   YearsSinceLastPromotion    1029 non-null    int64
34   YearsWithCurrManager       1029 non-null    int64
dtypes: float64(3), int64(23), object(9)
memory usage: 281.5+ KB
```
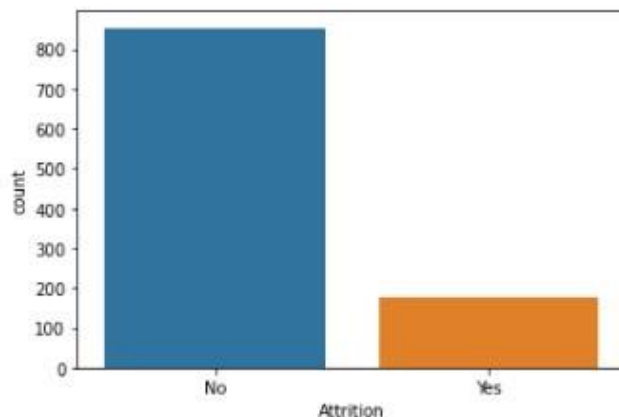
```
In [73]:  #Distribution of target variables
          sns.countplot(data = attrition_data, x = attrition_data['Attrition'])

Out[73]:  <AxesSubplot:xlabel='Attrition', ylabel='count'>
```
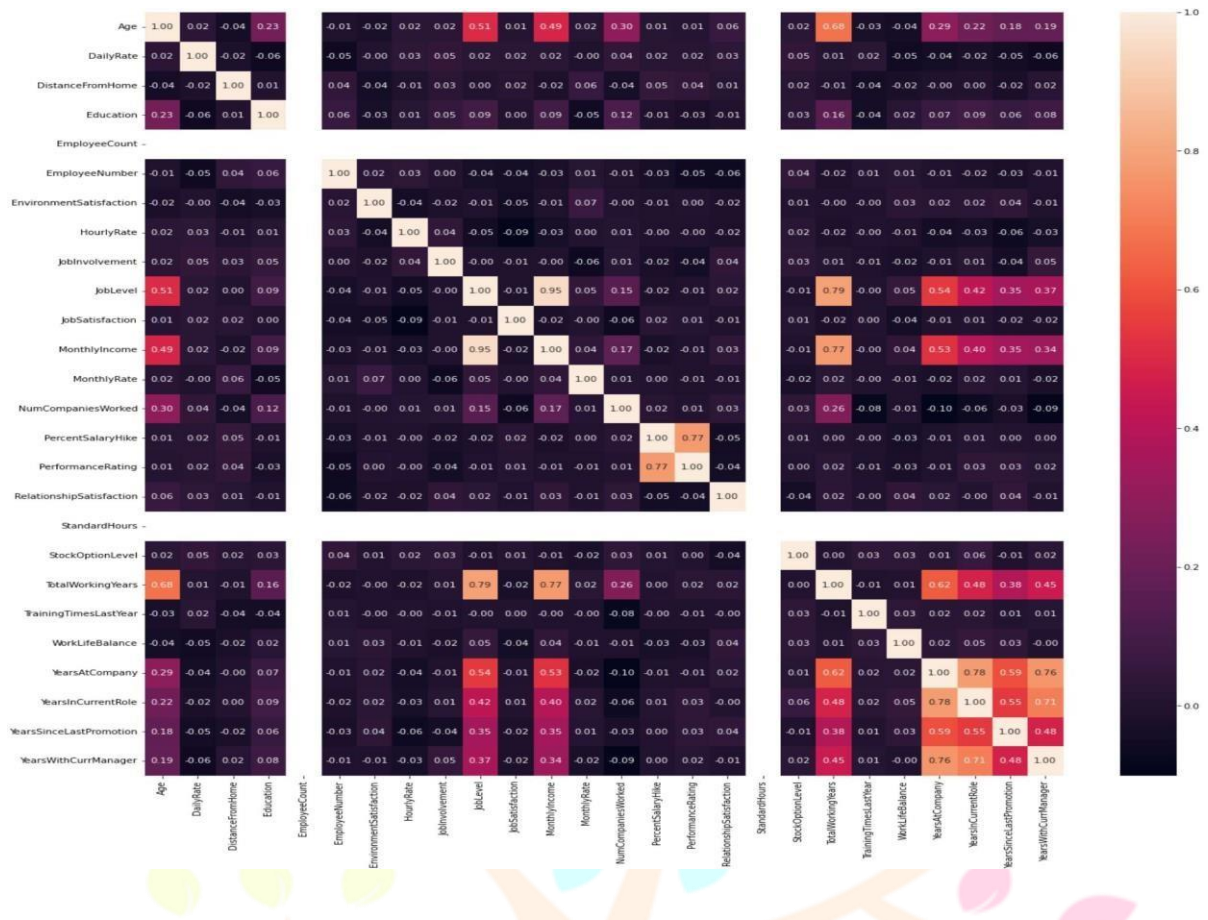

In[74]

```
#Correlation plot
f,axs = plt.subplots(figsize=(20, 20))
sns.heatmap(attrition_data.corr(), annot = True, fmt= '.2f')
plt.show()
```

```
In [75]:   #Converting the categorical target variable to numeric form
           opt=[]
           for row in attrition_data['Attrition']:
               if(row=="No"):
                   opt.append(0)
               elif(row=="Yes"):
                   opt.append(1)
           attrition_data['opt']=opt
```

```
In [76]:   # Categorising the feature and the target variables
           feature = attrition_data.drop(['Attrition','opt'],axis=1)
           target = attrition_data.loc[:,'opt']
```

```
In [77]:   #Transforming categorical variables to dummy variables
           BusinessTravel = pd.get_dummies(feature['BusinessTravel'],drop_first=True)
           Department=pd.get_dummies(feature['Department'],drop_first=True)
           EducationField=pd.get_dummies(feature['EducationField'],drop_first=True)
           Gender=pd.get_dummies(feature['Gender'],drop_first=True)
           JobRole=pd.get_dummies(feature['JobRole'],drop_first=True)
           MaritalStatus=pd.get_dummies(feature['MaritalStatus'],drop_first=True)
           Over18=pd.get_dummies(feature['Over18'],drop_first=True)
           OverTime=pd.get_dummies(feature['OverTime'],drop_first=True)
```

```
In [78]:   #Eliminating the variables which are not required
           feature.drop(['BusinessTravel','Department','EducationField','Gender','JobRole',
```

```
In [79]:   #Concating the dummy variables to form the original feature variable
           feature = pd.concat([feature,BusinessTravel,Department,EducationField,Gender,JobR
```

```
In [80]:   #Dataset split into test and training
           X_train,X_test,Y_train,Y_test = train_test_split(feature, target ,test_size=0.25,
```

```
In [81]:   #Replacing null values with 0
           X_train=X_train.fillna(0)
           X_test=X_test.fillna(0)
```

```
K nearest neighbour ML algorithm accuracy score equals: 0.810077519379845
K nearest neighbour ML algorithm Mean Absolute Error equals 0.18992248062015504
K nearest neighbour ML algorithm Root Mean Squared Error equals: 0.435800964455
2832
K nearest neighbour ML algorithm R-squared value equals: -0.2541666666666643
```
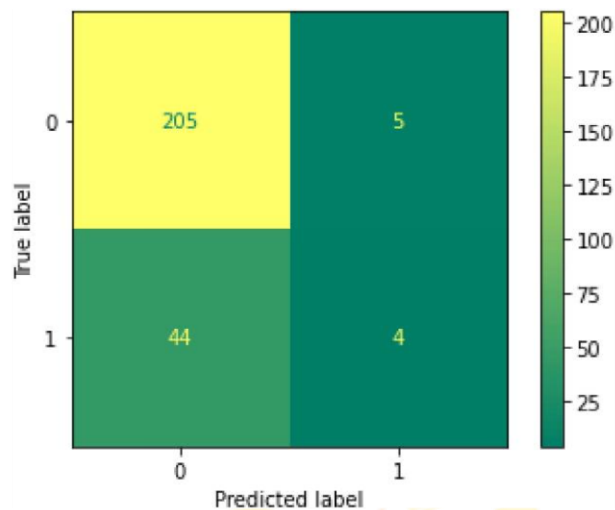

In [83]

```python
#K nearest neighbour ML algorithm
import warnings
with warnings.catch_warnings(record=True):
    k_near = KNeighborsClassifier(n_neighbors = 5, metric = 'minkowski', p = 2)
    k_near.fit(X_train, Y_train)
    Y_predct = k_near.predict(X_test)
    print('K nearest neighbour ML algorithm accuracy score equals:', accuracy_sc
    print('K nearest neighbour ML algorithm Mean Absolute Error equals', mean_ab
    print('K nearest neighbour ML algorithm Root Mean Squared Error equals:', np.
    print('K nearest neighbour ML algorithm R-squared value equals:',r2_score(Y_
    plot_confusion_matrix(k_near, X_test, Y_test,cmap='summer')
    plt.show()
```
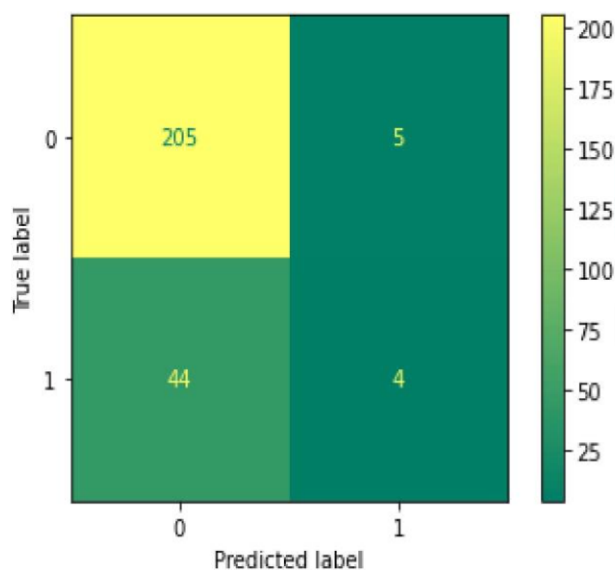
```
In [85]: #Logistic Regression ML algorithm
         import warnings
         with warnings.catch_warnings(record=True):
             logis_reg = LogisticRegression()
             logis_reg.fit(X_train, Y_train)
             Y_predct1 = logis_reg.predict(X_test)
             print('Logistic Regression ML algorithm accuracy score equals:', accuracy_sco
             print('Logistic Regression ML algorithm Mean Absolute Error equals', mean_abs
             print('Logistic Regression ML algorithm Root Mean Squared Error equals:', np.
             print('Logistic Regression ML algorithm R-squared value equals:',r2_score(Y_t
             plot_confusion_matrix(logis_reg, X_test, Y_test,cmap='summer')
             plt.show()
```

```
Logistic Regression ML algorithm accuracy score equals: 0.813953488372093
Logistic Regression ML algorithm Mean Absolute Error equals 0.18604651162790697
Logistic Regression ML algorithm Root Mean Squared Error equals: 0.431331092813
75365
Logistic Regression ML algorithm R-squared value equals: -0.22857142857142843
```
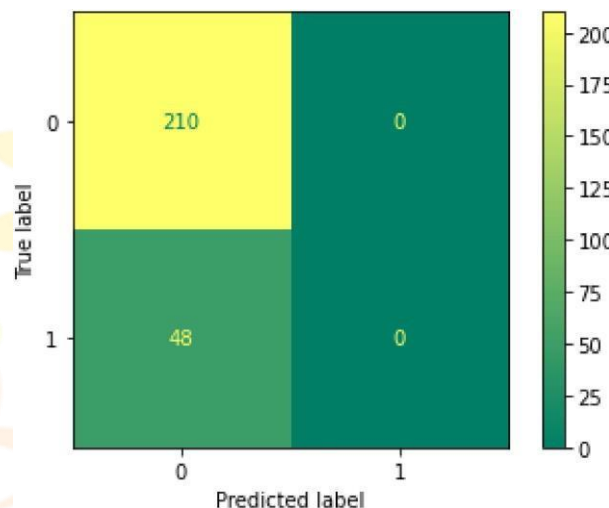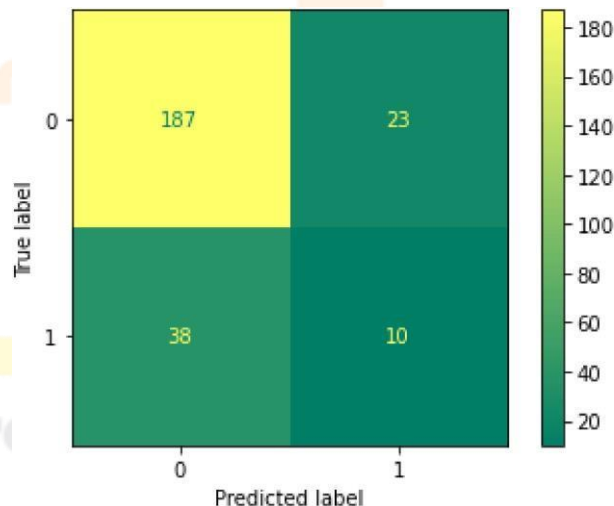


```
In [86]: #Gaussian Naive Bayes ML algorithm
         import warnings
         with warnings.catch_warnings(record=True):
             gaus_nb = GaussianNB()
             gaus_nb.fit(X_train, Y_train)
             Y_predct2 = gaus_nb.predict(X_test)
             print('Gaussian Naive Bayes ML algorithm accuracy score equals:', accuracy_sc
             print('Gaussian Naive Bayes ML algorithm Mean Absolute Error equals', mean_ab
             print('Gaussian Naive Bayes ML algorithm Root Mean Squared Error equals:', np
             print('Gaussian Naive Bayes ML algorithm R-squared value equals:',r2_score(Y_
             plot_confusion_matrix(gaus_nb, X_test, Y_test,cmap='summer')
             plt.show()
```

```
Gaussian Naive Bayes ML algorithm accuracy score equals: 0.7751937984496124
Gaussian Naive Bayes ML algorithm Mean Absolute Error equals 0.2248062015503876
Gaussian Naive Bayes ML algorithm Root Mean Squared Error equals: 0.47413732351
544274
Gaussian Naive Bayes ML algorithm R-squared value equals: -0.48452380952380936
```
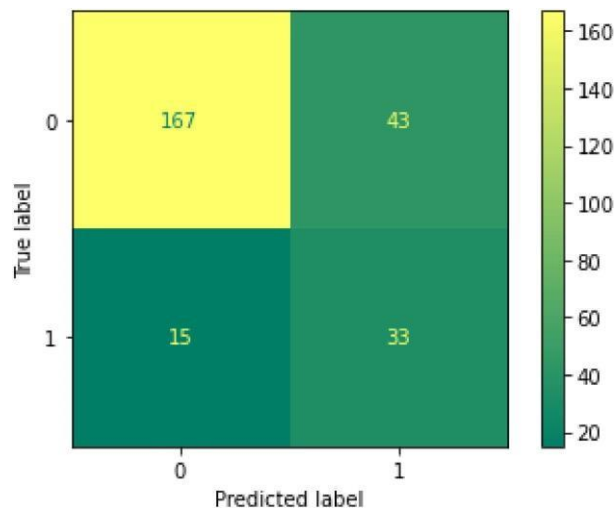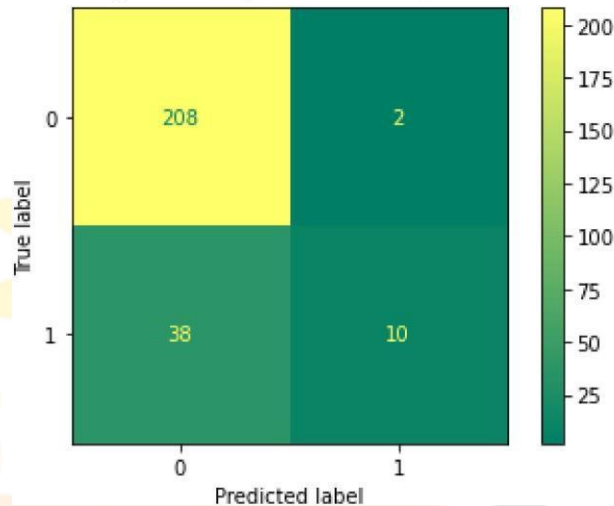
```
In [87]: #Decision Tree ML algorithm
         import warnings
         with warnings.catch_warnings(record=True):
             decsn_tree = DecisionTreeClassifier()
             decsn_tree.fit(X_train, Y_train)
             Y_predct3 = decsn_tree.predict(X_test)
             print('Decision Tree ML algorithm accuracy score equals:', accuracy_score(Y_t
             print('Decision Tree ML algorithm Mean Absolute Error equals', mean_absolute_
             print('Decision Tree ML algorithm Root Mean Squared Error equals:', np.sqrt(m
             print('Decision Tree ML algorithm R-squared value equals:',r2_score(Y_test, Y
             plot_confusion_matrix(decsn_tree, X_test, Y_test,cmap='summer')
             plt.show()
```

```
Decision Tree ML algorithm accuracy score equals: 0.7635658914728682
Decision Tree ML algorithm Mean Absolute Error equals 0.2364341085271318
Decision Tree ML algorithm Root Mean Squared Error equals: 0.4862449059138119
Decision Tree ML algorithm R-squared value equals: -0.5613095238095236
```

```
In [88]: #Random Forest ML algorithm
         import warnings
         with warnings.catch_warnings(record=True):
             rand_forst = RandomForestClassifier()
             rand_forst.fit(X_train, Y_train)
             Y_predct4 = rand_forst.predict(X_test)
             print('Random Forest ML algorithm accuracy score equals:', accuracy_score(Y_
             print('Random Forest ML algorithm Mean Absolute Error equals', mean_absolute_
             print('Random Forest ML algorithm Root Mean Squared Error equals:', np.sqrt(m
             print('Random Forest ML algorithm R-squared value equals:',r2_score(Y_test, Y
             plot_confusion_matrix(rand_forst, X_test, Y_test,cmap='summer')
             plt.show()
```

```
Random Forest ML algorithm accuracy score equals: 0.8449612403100775
Random Forest ML algorithm Mean Absolute Error equals 0.15503875968992248
Random Forest ML algorithm Root Mean Squared Error equals: 0.3937496154790789
Random Forest ML algorithm R-squared value equals: -0.023809523809523725
```