

Managing Talent by Data Visualization

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Abstract

The internet highway is making the world highly digitized and interconnected. The dynamism of global markets are transforming the business landscape. The changing demographic trends, advances in the technology, fierce competition, and the changing customer are the factors forcing companies to alter their way of operations in every region of the world. Economies are becoming knowledge based. These structural changes are compelling companies to recruit and retain people with high skill sets. Human Resources Analytics is the new mantra of the current era for recruiting and retaining the right talent in the company. Today, the HR executive is considered to be a key strategic player who is proficient at using evidence based analysis to design HR strategies on identifying new business leaders, or promoting employees.

This paper reveals how data visualization can help to analyze the following in the simplest way.

- i. Identifying top and bottom performers in sales department (only one department is considered for study purpose)
- ii. Monitor the Organization's Talent Review (OTR) process
- iii. Monitor & compare the compensations with respect to performance & achievements of the employees(sales department)
- iv. Identify potential leaders and the cost of losing them
- v. Attrition

Keywords: HR Analytics, Dash Board, Talent Management, Data Visualization, OTR, Attrition

Managing Talent through Data Visualization

Introduction

Talent management gained prominence in the last decade of the twentieth century. The reasons for the importance can be [i] companies started recognizing Human Resource as a key player to developing competitive advantage and [ii] the changes brought in businesses around the world due to the disruption in the I.T. sector. The internet highway has paved way to huge amount of data. Many companies have started using these data for decision making. Information based decisions are the new mantra of today's business processes and talent management is no exception.

Companies are opting for innovative approaches that allow them to manage their talent challenges efficiently and proactively. These new approaches are essentially based on two major trends: a growing availability of data on internal and external talent pools, and the adoption of analytical and predictive analyses centred on business needs. These trends are driving a veritable evolution of competencies within human resources functions.

With the availability of hardware and the software, companies have a large pool of data containing basic information such as hire dates, job positions, and ages to more sophisticated data on personality traits, behaviour and competencies. This has enabled HR teams to use analytics and predictive talent management

to understand what is really happening in the organization, to identify the causes of the situations observed and to make projections on future scenarios about internal and the external talent pool. Analytical approach help to improve the quality of strategic decisions related to talent management.

Many models on talent management are proposed – Pocztowski’s Model for Talent Management and Heinen and C. O’Neill’s Talent Management Models. These models indicate that the talent management activities of an organization are the subset of organizational strategy. Talent management requirements can be identified by data analysis. The result of the analysis can include a diagnosis of shortcomings in processes with a view to set management priorities.

HR Analytics or People Analytics as some call it, can be a support system in finding solutions to challenges like recruitment of right talent, career development, internal mobility and talent retention. The use of big data and the application of analytics to company’s HR processes can provide better solutions to HR problems. Techniques like Natural Language Processing, Machine Learning, Predictive Analytics and Data Visualization can help to find the right talent for the organization, streamline the HR processes and reduce cost. The key is to apply new insights from big data and analytics to the organization’s HR processes. For instance, when a business need arises, the HR head would like to see whether the right person is available internally or there is a need to hire him from external sources. If the recruitment is from external source, a lot of data about the candidate can be collected from the candidate’s presence on social networks like Facebook, LinkedIn, Instagram or Tweeter. Psychologist Dr Michal Kosinski developed a method to analyse people in minute details based on their Facebook activities. Through his tireless work, Dr Kosinski designed a model in 2012 which could predict on the basis of the likes by a user on Facebook. With 68 likes Kosinski could predict the colour of the skin of the Facebook user with 95% accuracy, their sexual orientation with 88% accuracy. And it didn’t stop at this, the model could very well predict intelligence, religious affiliations, as well as alcohol, cigarette and drug use, could all be determined. Kosinski’s model can help understand human psychology based on “The Big Five Personality Traits” –

- i. Openness to Experience
- ii. Conscientiousness
- iii. Extraversion
- iv. Agreeableness
- v. Neuroticism

The above model is well known as The “OCEAN” model. 80% of the candidate’s personality can be determined with this kind of analytics which can enable the HR Head to look out for the right candidates for interviews. This can save time and money involved in the process.

Literature Review

Talent Management is a concept that emerged in 1990s and is been continuously adopted by companies across the globe. Eminent researchers like Ulrich (1989, 1996, 2005), Barner (2000), Michaels, Handfield- Jones and Axelrod (2001), Meisinger (2009), Berger and Berger (2004), Rothwell (2005), Lawler III (2008) and Cappelli (2008) have indicated the importance of talent management.

Talent management is an integrated strategies or systems designed to increase workspace productivity by developing processes to attract, develop, retain and utilize people with the required skills and aptitude to meet the current and future business needs (Mudoli 2008).

John Hopkins University define Talent Management as “a set of integrated organizational HR processes designed to attract, develop, motivate, and retain productive, engaged employees.” One can extend this definition to include – “Talent Management is a systematic attempt to identify key positions which contributes to the organization’s competitive advantage, and developing the talent pool of highly potential and high performing employees within the organization. Today, HR practitioners are contemplating on Talent

Analytics to identify talent, design an appropriate process to recruit and retain the right talent in the organization to build its competitive advantage. With the right talent injected in the business processes, organizations can bring in efficiency at the lowest cost possible. Practitioners of Talent Analytics are using some fundamental practices like reporting infrastructure, dash boards and employees' surveys (Jasmeet Kaur and Alexis Fink, 2017)

Talent Analytics is accepted by both the business houses and the HR community. Experts in Talent Analytics refers to the use of more sophisticated tools to analyse data to gain deep insights. For instance a strong correlation between HR data like salaries, promotion rate etc. may help build predictive models on employee retention and attrition. Lawler, Levenson and Boudreau (2004) suggested that Talent Analytics involves "statistical techniques and experimental approaches" to show the impact of HR activities on organization's performance. Bassi (2011) reported that "Talent Analytics is an evidence based approach of taking better decisions, it consist of a number of tools and technologies ranging from simple reporting to developing predictive models.

Talent management practices are aimed at reducing attrition, improving employee benefits, employee engagement and employee productivity (Mudoli, 2008). Talent management is a win-win situation to both the organization and the employees.

Research Gap

Today's business pressures are forcing the organizations to get the best talent on board. Human Resources managers are facing challenges like high attrition, absenteeism, recruiting right people and forecasting the future requirements of the talent. On the other hand, understanding of employees' psychology plays an important role in talent retention. It is difficult to quantify certain variables like job satisfaction and attitudes of the employees towards organization's work culture. But these factors are so important that one cannot ignore them. Hence one must find a way to quantify them and analyse. Data Visualization can help to quantify such data.

A lot of literature is available on talent management which also informs the use of high end analytics like predictive modelling. Organizations are using tools of Statistics and Data Mining for obtaining insights from the data which can be a complex affair. This complexity can be turned into simplicity by using techniques of Data Visualization. For instance, if you want to compare performance of, say, about hundred employees of a department, you can imagine the quantum of numerical one has to go through for such comparison. Data Visualization tools like

Visual Analytics can help simplify the situation. Through such tools, complicated statistical models are constructed in the background and the output can be measured in pictorial format in the shortest possible time.

Objectives of Study

1. To demonstrate the use of Data Visualization to HR managers.
2. To gain valuable insights from HR data in quick time while avoiding the use of complicated statistical models.
3. To demonstrate the depth of analysis that Data Visualization can provide to HR managers to take quick decisions.

Data Analysis

The Model

This paper is an attempt to simplify decision making process in Talent Management. It explains how data visualization can help HR managers to get quick insights into the data and take timely decisions and control HR cost. The model used in this analysis is mentioned in the fig. 1 below.

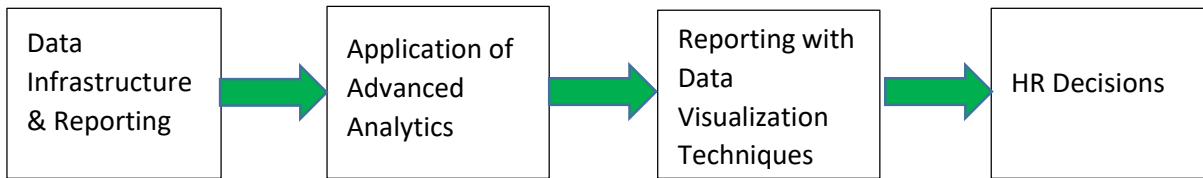


Figure 1: The HR Model

Steps in Analysis

Data Infrastructure and Reporting

The step involves data collection. Four data sets were used in the analysis

- a. Employees Records comprising of 29 variables
- b. Employees Training Details comprising of 6 variables
- c. Employees Engagement Survey comprising of 38 variables.
- d. Employees of Sales Department with 19 variables
- e. Employees Attrition Details with 15 variables

Application of Advanced Analytics

Three types of advanced analytics were used in designing the dash boards.

a. Descriptive

The descriptive analytics will reveal and describe the relationships and current and historical data patterns. It includes dash boards and score cards, workforce segmentation, data mining for basic patterns and periodic reports

b. Predictive

Predictive analytics cover statistical modelling and data mining that use historical facts to make predictions about the future. It calculates probabilities and their potential impact. It can create models that calculate the probabilities of selecting the right people to hire, train and promote.

c. Prescriptive

This analysis shall help HR in providing decision options and workforce optimization.

Reporting and Data Visualization

The outcome of the above analysis is represented in the form of dash boards. These enables to get quick insights of data and help avoid going through large chunks of numbers.

HR Decisions

The dash boards provide a clear picture of patterns underlying the data. For example, on the dash board of “Organization’s Talent Review” (OTR), one can clearly identify the risk of retention of an employee. Or you can compare performance of all the employees of a department at a single point of time.

Talent Analytics can be defined as “Data and Analytics applied to HR business needs and the analytical objectives and initiatives aligning to the organization’s HR Vision.” Talent Analytics provide answers to four categories of questions under (i) Talent Acquisition, (ii) Talent Retention and Development (iii) Performance Management and (iv) Employee Satisfaction

Talent Acquisition

- i. Can you predict the talent needs?
- ii. Is the company hiring the right talent?
- iii. What makes an employee successful in my organization?
- iv. What makes an employee successful in a particular division?
- v. What makes an employee successful within a particular job function?

Talent Retention and Development

- i. Who is at the risk to leave the organization?
- ii. When?
- iii. What leadership development is needed?

- iv. What is the value of a high performer?
- v. How do you invest in them?

Performance Management

- i. How do you motivate an under-performer?
- ii. Who are the top performers?
- iii. What makes a good manager?

Employee Satisfaction

- i. What makes an employee feel valued?
- ii. How to enhance employee satisfaction?
- iii. What services and incentives should be offered?

With the latest technology, organizations can build better Talent Acquisition process. The technology can help HR to use the data available on social media like Facebook, Instagram, or Tweeter. For instance Dr Michal Kosinski developed a method to analyse people in minute details based on their Facebook activities. . Through his tireless work, Dr Kosinski designed a model in 2012 which could predict on the basis of the likes of a user on Facebook. With 68 likes Kosinski could predict the colour of the skin of the Facebook user with 95% accuracy, their sexual orientation with 88% accuracy. And it didn't stop at this, the model could very well predict intelligence, religious affiliations, as well as alcohol, cigarette and drug use, could all be determined. Kosinski's model can help understand human psychology based on "The Big Five Personality Traits" –

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The Human Capital Dash Board



Figure 2: Actual Dash Board for Talent Management

A dashboard is an application or browser-based interface that helps measure organizational performance in terms of organizational units, business processes, and individuals. It offers different types of visualization &

interfaces such as: Line-Charts, Bar-Charts, Gauges, Word-Cloud, Cross-Tables, etc., to view the information which assist users for the decision making or performance-related tasks.

Human capital dashboard is workforce analytics tools. Simply collecting data isn't helpful, data is only valuable when it tells a story. That's where this modern dashboard and analytics comes in, which in turn lets your business make data driven decisions.

With the Human Capital Dashboard you can identify:

- The difference in skill level between top and bottom performers in the company and identify gaps in employees' skills and suggest appropriate training programs to improve the skills.
- One can identify high potential leaders and calculate the cost of losing them
- One can monitor the Origination's Talent Review (OTR) based on talent grid position in the organization.
- One can monitor & compare the compensations with respect to performance & achievements of the employees.

The dash board in figure 1 covers a number of analyses required for talent management. Figure 2 is the sketch of figure 1 given for clarity. The dash board contains the following analyses.

- i. Compensation (Opportunity to Earn, OTE)
- ii. Performance
- iii. Attrition Analysis
- iv. Organization Talent Review (OTR)
- v. Employee Training

SAS Visual Analytics software was used for data analysis and designing the dash board. For organizations having a large number of employees, analyzing the HR related data can be time consuming, Data Visualization techniques can be used for quick and accurate analysis and decision making.

Data Analysis

Effective HR strategies come out of rigorous analysis of the business related human capital issues and their fundamental causes. Till recently, such analysis was based on qualitative approaches. For instance employee surveys, focus groups and interviews with managers were the main sources of data used for analyzing and determining talent management strategies. These qualitative approaches have the following limitations.

- i. There is a possibility of substantial discrepancy between the perceptions obtained from the interviews or surveys and actual facts observed by analyzing the data.
- ii. Data obtained from such sources may be biased

Today, analysis of talent issues can be often based on the examination of human capital indicators like performance rating, promotions, and salary progressions.

Several companies have started using analytics and predictive approaches for talent management. For instance, through analytics, it is possible to anticipate changes in the internal and external talent pools using workforce demographics. The demographic characteristics like age, experience, and career paths can be analyzed to understand the talent pool in the organization. The first module on the dash board that is discussed below is compensation.

- i. **Compensation**

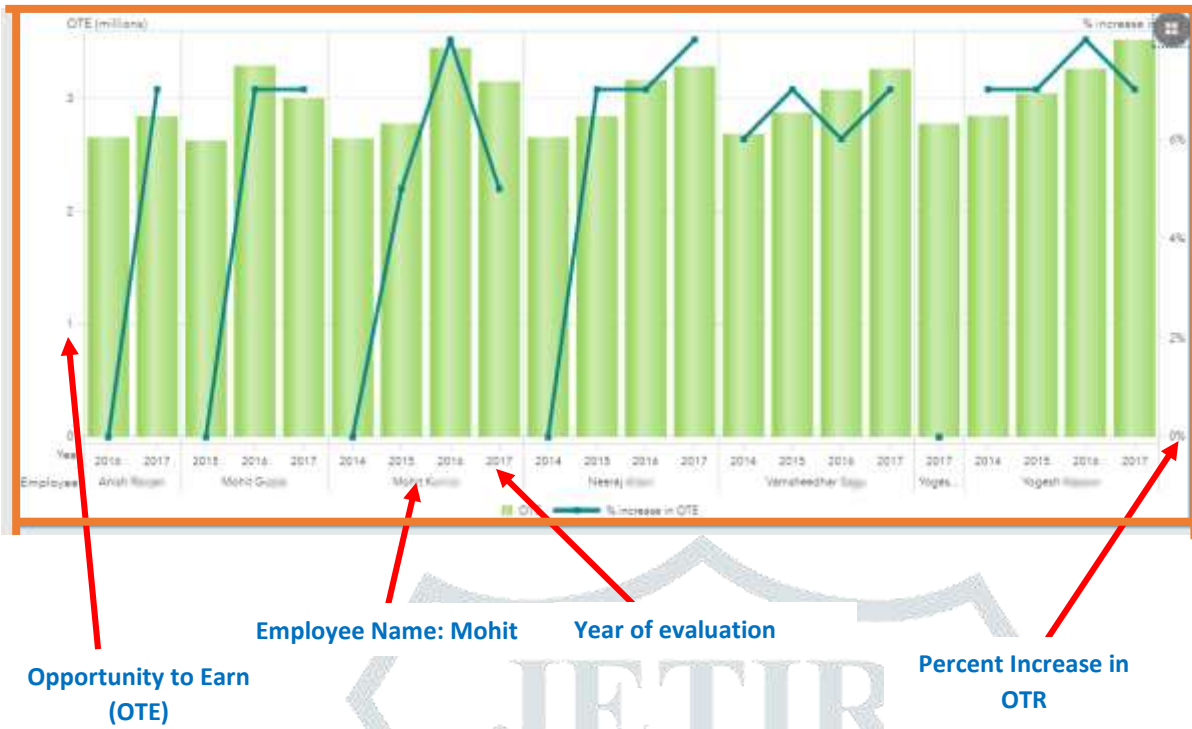


Figure 3: Dash Board for comparing OTE and employee performance

This dash board is a two dimension graphic with X axis representing employees of a particular department and the year of evaluation. The left Y axis plots the Opportunity to Earn (OTR) in millions of Indian rupees and the right Y axis represent % increase/decrease in the earnings. The vertical green color bars represent year wise opportunity to earn for the employees which is an aggregate of fixed salary and incentives. Let’s consider an employee, Mr Mohit, Sales Representative, whose four year data are available, from 2014 to 2017. Mohit joined the organization on 10th March 2014 with the OTE standing at rupees 2,640,000 in his first year of operation. Figures of Mohit are given in the table below.

Employee Code	Name of Employee	Date of Joining	OTE	% increase in OTE	Year
E079	Mohit	1-Mar-14	2,640,000	0.00%	1/Apr/2014
E079	Mohit	1-Mar-14	2,772,000	5.00%	1/Apr/2015
E079	Mohit	1-Mar-14	3,440,900	8.00%	1/Apr/2016
E079	Mohit	1-Mar-14	3,143,448	5.00%	1/Apr/2017

Table: 3 Opportunity to Earn (OTE)

The superimposed green color lines indicate the earnings of Mohit which also informs that he underperformed in 2015 (on his sales target), did well in 2016, and again fell short of his sales target in 2017. A direct comparison of performance can be done of all the employees of the department without getting into complicated numerical analysis.

The second dash board is a bubble chart, highlighting a direct relation between compensation and performance of an employee. The following scale is used to measure the performance of an employee.

Performance Rating	Title	Explanation
1	Off - Track	Meet some expectation / Need improvement
2	Progressing	Key Contributor
3	On Track Achievement	Excellent Performer
4	On Track Exceeding	Distinguished

Table: 4 – Performance Ratings (1 – Lowest, 4 – Highest)

The X axis represent year and achievement of the employee in percent. Y axis plots the performance rating and the color bubbles indicate the percent increase in OTR for an employee. The size of the bubble indicates the percent increase in the OTR of an employee. Mohit’s achievements are highlighted by the blue color bubble.

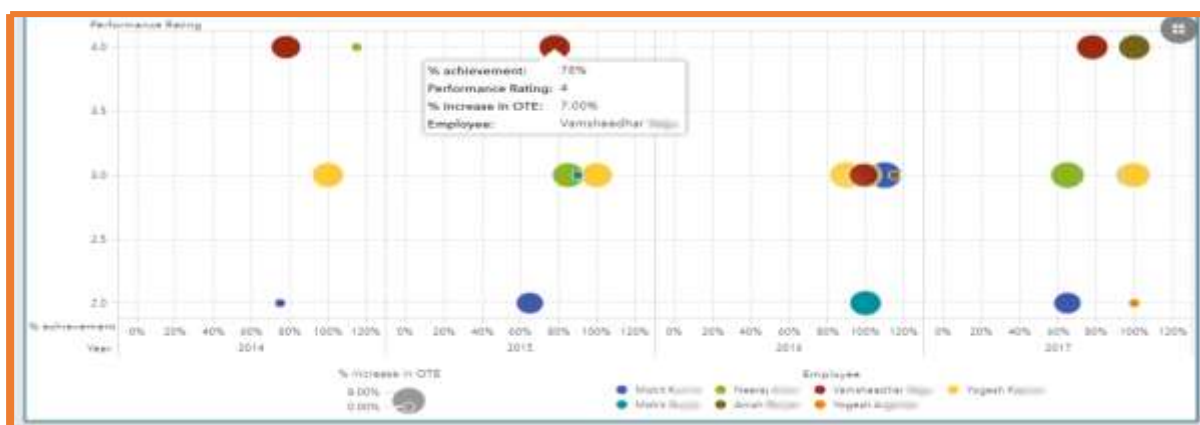


Figure 4: Performance Rating and Achievement of an employee

In 2014, Mohit’s performance rating was 2.0 with an achievement of 78%. In 2015, the blue color bubble shows an increase in size, indicating a rise of 5% in the OTR but his rating continued to be at 2.0. In 2015, his performance shot up at 3.0 and again declined in 2017. The bubble sizes can also be matched with the percent increase in OTR as shown in Table: 1.

Placing the cursor on the bubble gives all the details of employee’s performance at a glance. Reports on all employees’ performances can be generated by a single click.

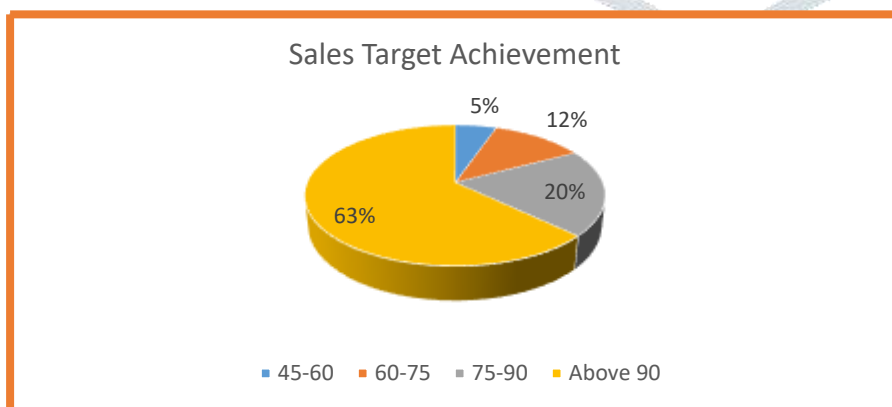


Figure 5: Pie diagram for Sales Target Achievement

ii. Recruitment – Talent Acquisition

Every organization take initiatives to attract the best of the talent available in the market. Today attracting talent has become a challenge. Employer’s branding can be a good way of attracting talent. Branding is a

systematic way of by which an organization can distinguish itself from others that it provides a great place to its employees to work in the best of the environment. Chhabra and Sharma (2014) find positive relationship between employer’s brand and the likelihood of applying.

Studer (2006) believes that there are three steps for selecting talent: (1) use pre-screening to select for organizational fit, (2) use behavioural-based interview to ensure job and skill set fit and (3) use peer interviews to ensure cultural fit. The first step ensures that the candidate is willing to support the values of the organization, hence the attitude is important. Information about the personality traits of the candidate can be collected from his/her presence on the social networks. The second step helps to understand whether the candidate is having the necessary job skills. The third step involves having a few high performing managers to engage in the selection process of new employee. This step will ensure that the new employee can fit in the culture of the organization.

The HR team will try to locate potential candidates from various channels like Executive Search, Employee Referral, Social Media Hiring or Win-Back Employees. The recruitment dash board offers you the facility of viewing the past history on recruitment from the above mentioned channels.

Position Level	Executive Search	Employee Referral	SocialMedia Hiring	Win-Back employees
Sr. Management	2	9	7	0
Management	12	3	4	3
Middle Management	27	8	11	1
Individual contributor	43	3	9	4
Contractual Staffing	9	3	3	9
Total	93	26	34	17
%	55%	15%	20%	10%

Table 5 – Talent Acquired Through Various Media

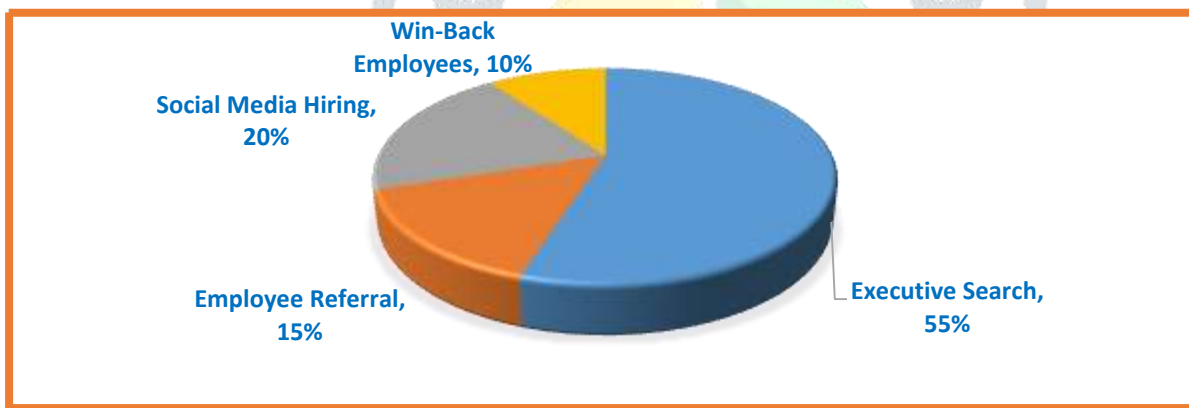


Figure 6: Pie Chart Showing Talent Acquired from Various Media

iii. Attrition

Attrition can be defined as “a reduction in the number of employees through retirement, death or resignation”. It is the shrinkage in the number of employees. Attrition in a limited sense is desirable for influx of new ideas in an organization. It brings in new talent, people with different ideas, and open up avenues for change, development and improvement in the organizational processes. In a limited sense, attrition can bring in gains to the organization. However, if attrition increases beyond a certain level, it may create problems as good talent may go elsewhere in search of green pastures. A substantial investment of time and money is needed to acquire and develop good talent. With attrition going high, no organization shall be able to transform these investment into profits.

Sagar et al (1998) referred to turnover cognitions as mental decisions intervening between an individual’s attitudes regarding the job and the stay, or leave, decision. Intention to leave has a behavioural implication as it entails one’s attachment to the organization (Iverson and Roy, 1994) or the degree of likelihood of an employee forfeiting membership in an organization (Bosh off et al., 2002; Currivan, 1999).

The problem of Attrition becomes intense when some companies encounter difficulties in retaining their best of the talent, particularly in the context of volatile labour market. With high attrition, not only the organizations suffer talent loss but the direct and the indirect cost of labour turnover can be substantial.

A thorough analysis on attrition can be obtained from the Attrition Dash Board as shown below.

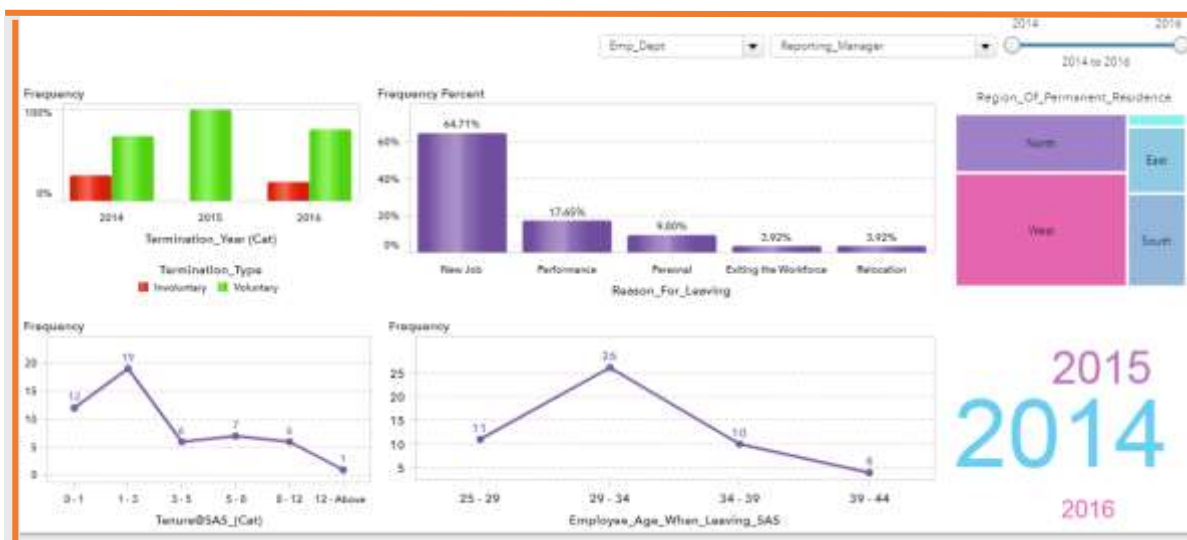


Figure 7: Attrition Dash Board

The attrition analysis can be started by analyzing the reasons for leaving the organization.



Figure 8: Reasons for Leaving Dash Board

Reason for Leaving	Percent
New Job	64.80%
Personal Reason	9.80%
Performance	17.60%
Other	7.80%

Table 6 - Attrition Analysis Reason for Leaving

The above table gives a clear idea of the dominating reason for employees to leave this organization. The next graphic indicate the percentage of two categories leaving the organization. (i) Percent of males and females leaving and (ii) percent of married and unmarried leaving.

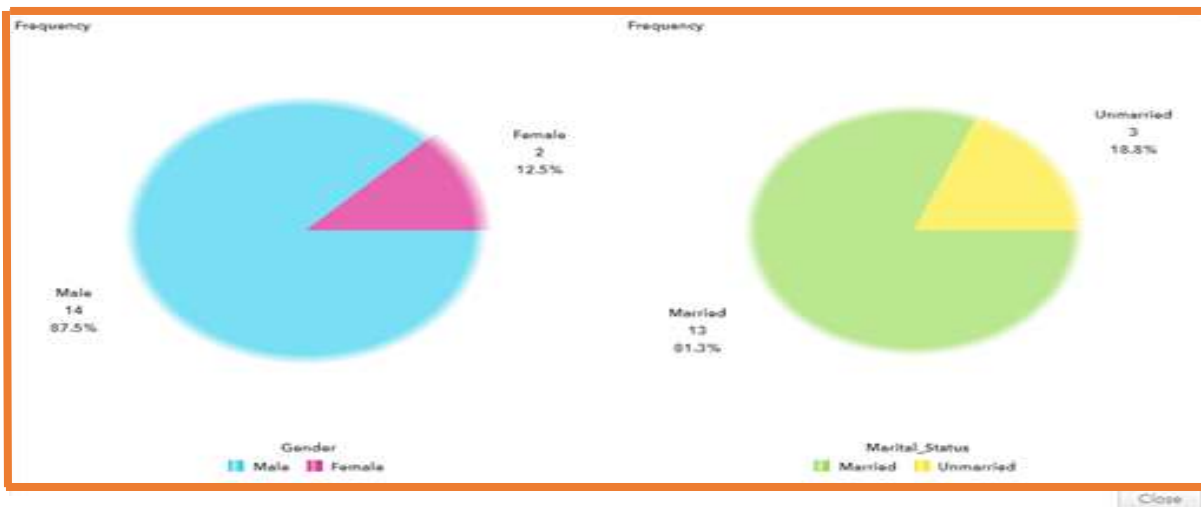


Figure 9: Percentage of Males/Females and Married/Unmarried Leaving

Category	Percent	Total
Males	87.50%	
Females	12.50%	100%
Married	81.25%	
Unmarried	18.75%	100%

Table 7 - Percentage of Males/Females and Married/Unmarried Leaving

Region-wise/Department-wise analysis for reasons for leaving
The dash board enables region-wise reasons for leaving the organization.

Area	Percent of Employees left
Mumbai	78.80%
Delhi	15.10%
Bangaluru	6.10%

Table 8 - Area Wise Attrition

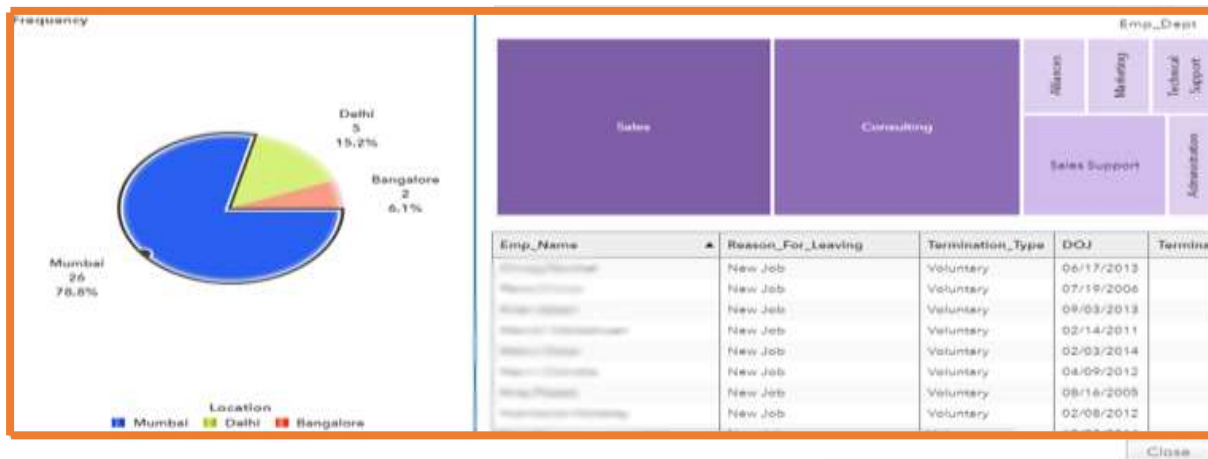


Figure 10: Region-wise Details of Leaving the Organization

The purple and blue colour rectangles in the right hand top corner indicate the proportion of attrition in various departments of the organization with sales department having the highest attrition. The dimensions of the rectangle indicate the size of attrition.

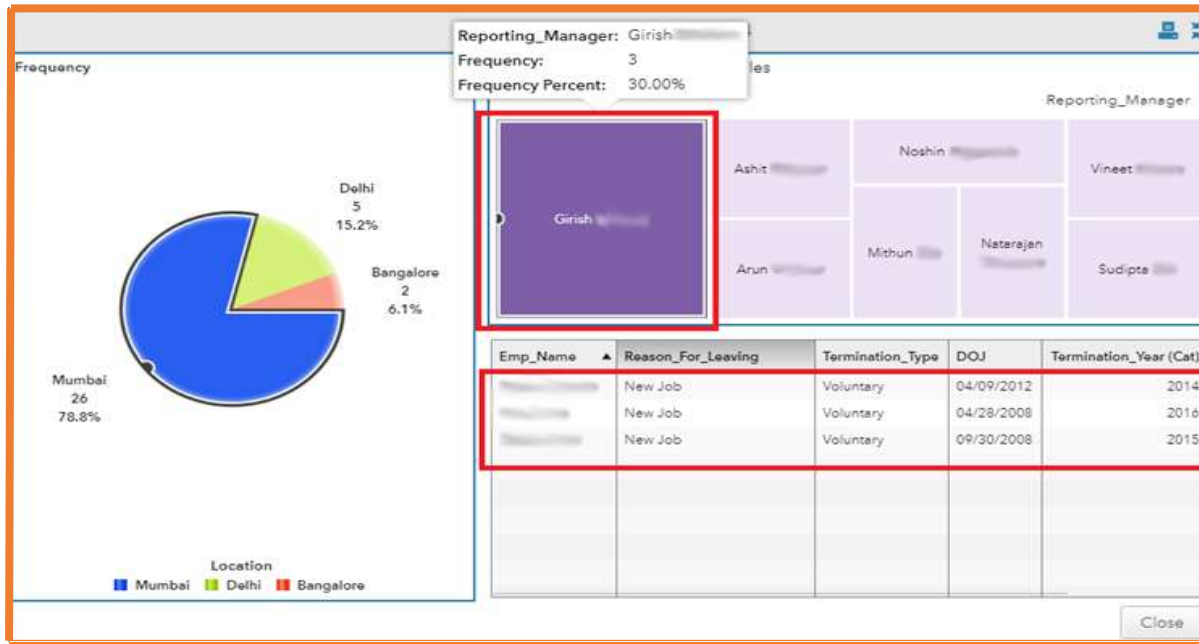


Figure 11: Attrition on the basis of Reporting

The above dash board informs manager wise attrition rate, with reasons assigned in the bottom right side of the above table. The dash board is also capable of providing information like tenure of the employee in the current organization, his/her previous experience, number of promotions received in this organization, number of managers under whom he/she worked with, and the number of jobs changed. The blue colour band on the dash board indicate that an employee detail is selected and the graphics below gives the details of the employee.



Figure 12: Past History of the Employee who has left the organization

The bar graph in the left hand top corner provide information whether the termination of employees was voluntary or involuntary.



Figure 13: Dash Board for Attrition

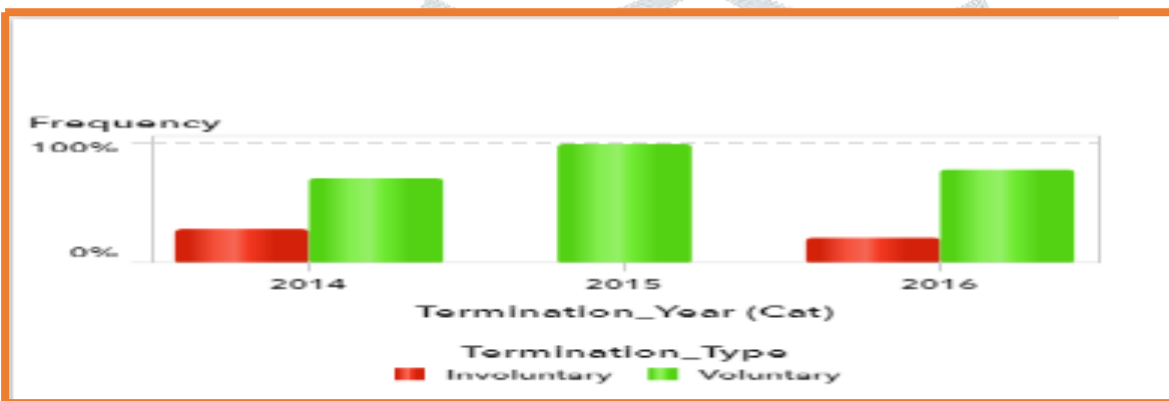


Figure 14: Attrition – Voluntary / Involuntary

The next bar diagram indicates statistics on reasons for leaving the organization. 64.71% of the employees left for better opportunities elsewhere. 17.65% were forced to leave due to bad performance.

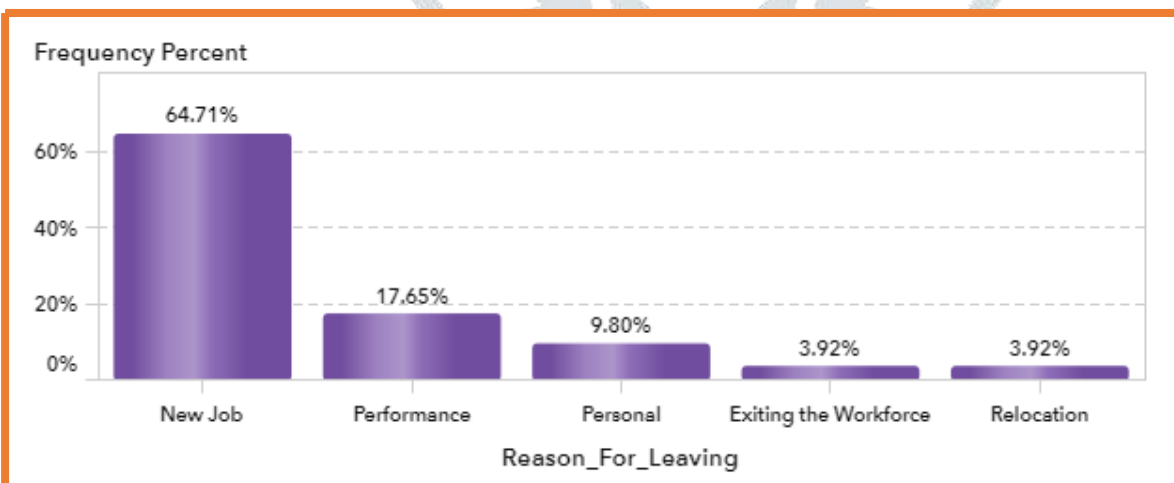


Figure 15: Reasons for Leaving

You can also figure out data on the trend of tenure of employment in this organization. The graph below indicates maximum attrition is in the band of 1 – 3 years tenure. Attrition goes down as the tenure of employees’ increases.

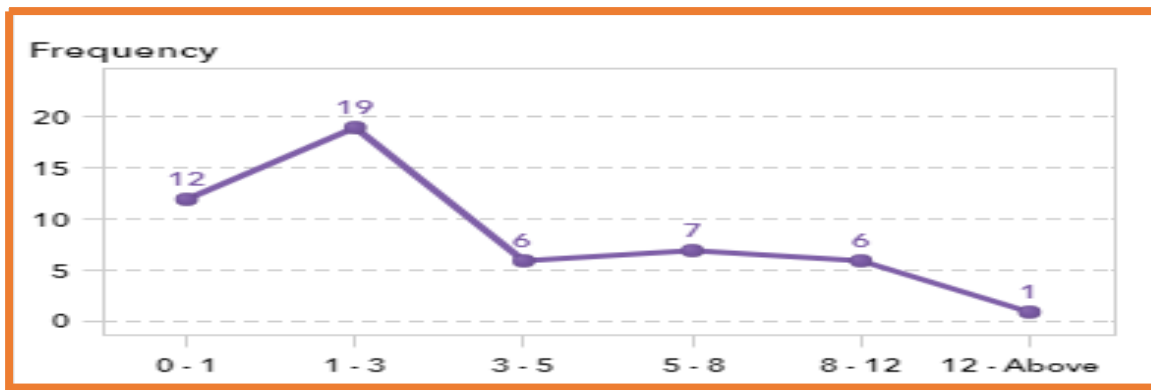


Figure 16: Tenure of Employees when Left

Studying the age factor on attrition indicate that younger people are more anxious to move out of the organization as indicated by the following trend.

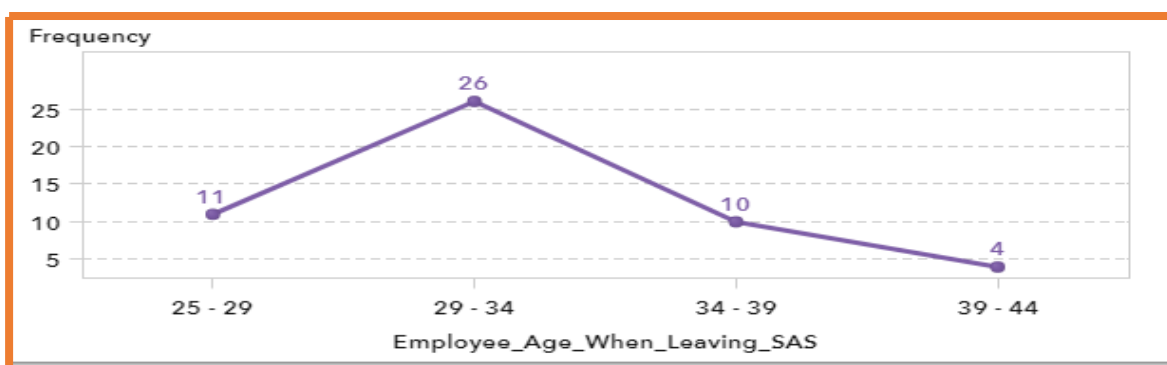


Figure 17: Age of Employees When Left

Here, there is a need for the organization to understand why younger employees in the age group of 29 – 39 years, and those who work for a period of 1 to 3 years leave and go elsewhere. The following graphics is known as “Word Cloud” and is useful to understand patterns like employees recruited from which previous organizations are more prone to attrition, or fresher recruited from which colleges/institutes contribute more to the attrition rate. The information on the graphics was masked as the researcher was not allowed to disclose the details. Once you know the information, you can design your strategies more cautiously to recruit people from such organizations.

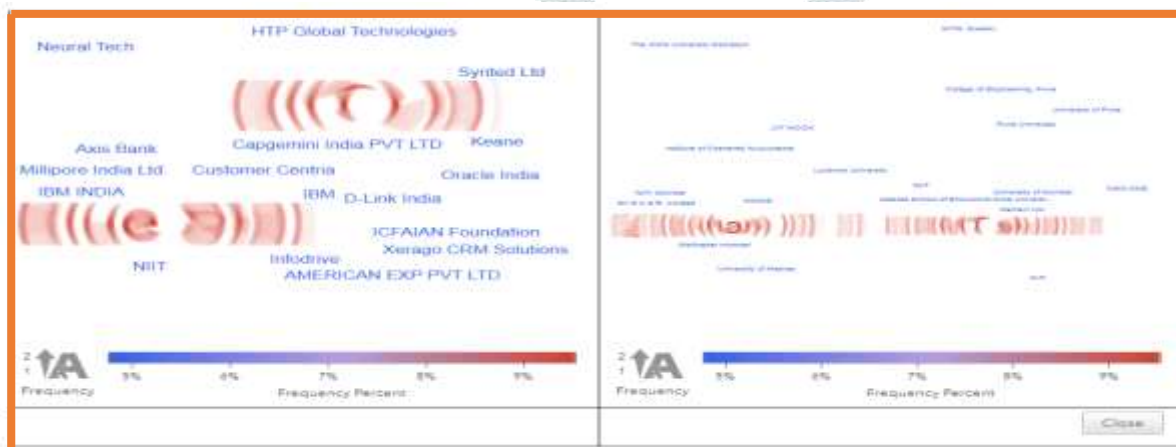


Figure 18: Word Cloud

Looking at the next graph, you will find the font size of the three years differ which indicates that in the year 2014, the attrition rate was the highest.



Figure 19: Highest Attrition Was in the Year 2014

iv. Organizational Talent Review (OTR)

OTR has become the fastest growing talent management practice in recent years. According to Eric Hanson, Talent review process makes sense when

- i. The management want to gauge the health of organization’s pipeline of leadership.
- ii. Take inventory of talent on an individual basis to identify performance gap.
- iii. Align individual’s career interests with opportunities for growth and development.
- iv. Identify high potentials for accelerated assessment and development in the preparation for more senior level roles.

Most of the approaches to talent review include identification of high-potential identification. High potentials is referred to as “top talent” in the organization. A pool of high potential involves critical investment of time and resources. The decision to nominate individuals in high potential list in not easy as it requires due diligence, clear criteria, accurate data and proper decision making. However, most organizations face a number of problems in talent review process.

- i. For large organizations, too much time is wasted on rating too many
- ii. Many times potential is vaguely defined
- iii. Potential is confused with readiness.

(Source: TALENT REVIEWS AND HIGH-POTENTIAL IDENTIFICATION, by Eric Hanson.)

The dash board, also called The Heat Map, of OTR below indicates the risk of an employee’s retention. The red band indicates that the risk of an employee retention is very high, with yellow band indicating “medium risk” and green band “low risk”. Employees with high risk of leaving

should be evaluated further to know the cost, the organization will have to bear on his/her loss and accordingly frame strategy for his/her retention.

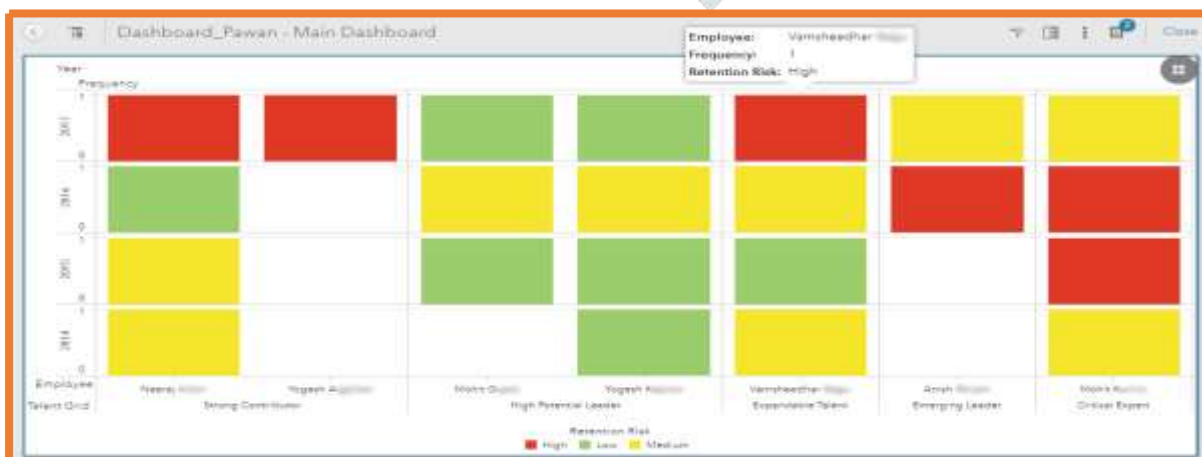


Figure 20: Dash Board for OTR Analysis

Conclusion

The above data visualization analysis indicate the simplicity in understanding the patterns hidden under data. Data visualization in HR Analytics demonstrated in this paper is not confined to the dash boards created, but one can use his/her own creativity to get more insights for better decision making.

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