

Attrition Prediction- Need of the Hour for Companies

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Abstract— In today's world many industries and specially IT (Information Technology) are experiencing high attrition rate. Managers and HR department are aware of some common causes of attrition in their organization. The impact of employee leaving voluntarily is not good for organization or to project in which they are working. Hence HR and senior managers and the policy makers of any industry are working together to reduce this voluntary exit. A good leader senses and understands employee needs and work with them and HR to fix the issues. However not all attrition causes are known to managers and when it actually happens it turns out as a surprise to managers, then they are not able to do much. In spite of many efforts taken attrition is still a problem in many industries. Some amount of attrition is certain and bound to happen like employee retiring or death of employee hence the scope of this work is only restricted to voluntary exit.

On many occasion HR department has felt that if they would have known earlier, or they could have picked the sign of exit, they might have prevented good employees leaving. With vast amount of historical data available within the organization, and through analytics & machine learning it is possible to predict attrition. These tools not only predict but also show some clear pattern in attrition. Many organizations today uses COTS attrition prediction tool or build their own in-house prediction tool. The scope of this work is to discuss clearly attrition, its impact and how to predict the sign of dissatisfaction in employees. It also gives the factors or common cause of attrition. These factors then are effectively used by managers to design a retention strategy for the employee or find his replacement. Keeping in mind that the hiring cost for new employee is very high, attrition prediction tool automatically becomes the need of the hour. At the same time management becomes aware of the situation and are in position to predict how much new backup recruitment can be done in future.

Index Terms— Attrition, COTS, Domain, Model, Machine learning, Notice period, Retention.

1 INTRODUCTION

Attrition is “the normal reduction of the employees caused by leaving the organization for reasons of retirement, death, or resignation” (National Performance Review, 1997) [3]. Certain attrition cannot be avoided like death or retirement; hence the scope of this work is only restricted to voluntary exit. Shortage of employee is another problem which becomes a concern when attrition is high. A Harvard business school study shows there is 35% of shortage of employee to fill new job requirement [1] which is huge. Shortage of employee for new assignment adds to the pain when attrition is high. However in this paper we mostly deal with attrition problem and how organization can predict and avoid them wherever possible. Having said that shortage of new skilled employee still remains a concern.

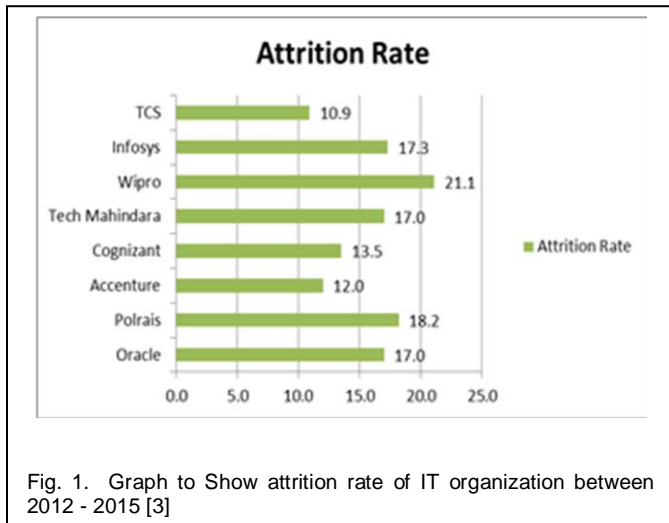
1.1 ATTRITION PROBLEM

Today, the problem of attrition is not only faced by information technology (IT) organizations but many organization where skilled manpower is required. However the attrition rate in IT organizations is higher than the attrition rate in any

other organization which are not IT. This trend is same in India or in global scenario where IT industry has high attrition rate. The new generation of employees comprises mostly knowledge employees and are closely connected with social media for information. They are tech-savvy, aware of market requirement, materially focused and these are the people at higher risk of changing job. Skilled employees are the main assets of any IT sector. These employees gained their skill both technical and domain with the years of work experience. And hence they add value to their organizations through their skills. These are built across months of training and work experience and time and cost is involved. Like other asset of organization these employees are one of the biggest assets of IT organizations. Hence the most challenging issue faced by HR departments in IT organizations is to retain these skilled asset. Retention is a procedure in which the employees are inspired to remain with the organization [3].

Attrition rate in IT organization is highest at 23.5%, more than the normal average of any organization [3]. The below Fig 1. graph image is taken from survey conducted by a Setareh Shokat Sadry, where the attrition rate of few organization in India is shown during 2012 to 2014. The survey results clearly shows IT organization are mostly affected. Hence during this study we mostly speak of IT companies however this can apply to any organization which employs skilled people.

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1.2 ATTRITION COST

It is common knowledge in the HR domain that losing good people is expensive, because of high costs (and long time waiting) involved in finding appropriate people to replace lost employees. Here is a hypothetical example to get a rough idea of the attrition costs: Assuming an average cost of INR 10 thousand to replace an employee and assuming 1000 cases of attrition per year leads to a total attrition-related expenditure of INR 1 Crore per annum. Reducing attrition by 25% will lead to a saving of about INR 25 lakh, in addition to improved levels of customer satisfaction and project success rates [2]. Similarly cost can also be calculated with respect to any of the world's organization by just knowing the cost of per employee hiring in their own currency.

2 ATTRITION EFFECT

Employees are the most important asset of an IT company or to any organization. Attrition means employee leaving his organization to pursue another job, projects etc. Losing an employee has various effects on the organization which cannot be ignored. Few are listed below

- Difficult to find suitable replacement to backfill the position, even though the average notice period of many organization in India is 2 months.
- Time, cost is involved to recruit train the new employee.
- Cannot expect the new employee to be at par with the exiting employee even after ample of handholding and training.
- Customers/clients are dissatisfied with this situation all of sudden if their project/work is affected.
- The above list is case for common skill employee; the situation is tougher for special skill employee.

- Loss of good employee can diminish competitive advantage.
- Peers are affected by this behaviors and triggers scope for few more employees leaving.

A considerable amount of attrition is common and bound to happen. However excess employees leaving the job can trigger a snowball effect. This is surely a concern to organization and some thoughts have to be given here. Human Resource department is working to figure out solution for this critical issue, by introducing connect programs with company is one way. A good manager is aware and understands employee needs and work with them regularly to fix few problem. But the above mentioned solution; does not eliminate the issue to considerable amount and attrition still remains perturb in many organization.

Hence many organization are looking for an early warning system tool for HR and manager to predict attrition or atleast provide sufficient hint.

3 ATTRITION CAUSES

HR of the most company is aware of the main few common causes of the attrition in the organization. These causes are known to them by their experience in the field and during the exit interview. Few main causes/response are stated below

i) *Individual*: This cause category is mainly due to individual (employee) personal issue. Few sub causes in this category are; employee not happy with current compensation, Medical or family needs, Marriage, further study. Although in this category we try to find the exact causes but on few occasion HR is not able to know the exact reason for eg. employee has family dispute and he may inform HR that due to personal reason. hence we categorize them to others.

ii) *Work Related*: This cause mainly comprise of; demand of skillset in current market (more opportunity), tough working condition like often working late night and working in shifts, onsite travel opportunity, desired role, no growth, technology shift, career growth, commutation and transport.

iii) *Managers*: This is very important cause as it deals mainly with the relationship of employee with the manager and with organization. Few causes are; conflict with peer /supervisor, appraisal issue, lack of appreciation, autocratic leader, company brand image and culture, Facility.

4 ATTRITION PREDICTION A COMPARATIVE STUDY

We have chosen 2 case studies from various organization and survey papers, to show how they have used attrition prediction tool for their need.

Case 1: This was published in Bloomberg business on 30 Dec 2014, written by Jack Clark. The title was "Big Data Knows

When You're Going to Quit Your Job before You Do" [4].

Here VMware an American company is using prediction tool developed by Workday. Currently this tool is in testing phase of VMware. Workday Inc. sells mainly cloud based finance and HR software. The main goal of this prediction tool is to find any patterns in behavior of current employee. Patterns are employee activity like his last appraisal date, whether a promotion was given, his health condition, skillset requirement in current market. Once the pattern is predicted, this is used by HR to train the system again. VMware's senior director for worldwide human resources information systems, Amy Gannaway has confirmed that this tool does a very accurate prediction.

Workday's tool is able to identify which employees is leaving very precisely; is due to reason they have developed the tool with time and with experiences of their staff. It is based on machine learning and advance statistical method which predicts complex pattern. Their chief data officer Mohammad Sabah uses all his experience from Netflix and Facebook to build this tool. He used the same techniques Netflix uses to recommend movies. With the movie watching pattern of customer, and his friends pattern, the recommendation given was very accurate. Sabah later clarified and said that although the domain is so different one is movie watching behavior and other is employee attrition prediction, however the algorithm remains close and similar.

By combining company historical data on employee recruitment, appraisal, transfer, compensation, feedback, company policy with external factor of region like standard of living and market demand for special skills, Workday can pick patterns. In one case, Workday with its tool processed more than 1 million data of 1 lakh employees for around 25 years of records and provided suggestions. As you can see that if this software is trained in right way its prediction are very accurate. Its ability to learn over time is similar to experienced HR employee, who can pick vibes from employee when he is ready to exit or even thinking of exiting.

Case 2: This case study paper is a survey paper to find out the most influencing factor to quit job. Considering a high attrition rate in IT industry this is conducted on IT industry [3]. Survey results and conclusion are presented here.

Survey scope: 120 people with different roles and designation were asked set of questionnaire and data was collected. These people belong to 6 IT firm in pune city. For ease of the survey this questionnaire was divided into various Sections, like general information of the employee. The second section consisted of the factors related to attrition. Below Table 1 shows sample of 120 employees of various designation. Similarly the age group of sample employees is presented in Table 2. Speaking of education qualification of the employees then 64.2 % of employees were graduate while 35.8% of employees were post graduate. While 61 % of employees were males and 39% were females. This shows that sample data was spread across different segments of employees.

TABLE 1
DESIGNATION OF SELECTED EMPLOYEE [3]

Sr. no.	Designation	No of Employee	%
1	Manager	23	19.2
2	Sr. System Analyst/Associate Manager	37	30.8
3	System Analyst/Team Lead	25	20.8
4	Senior Software / System Engineer/Associate	26	21.7
5	Software/System Engineer / Associate	9	7.5
	Total	120	100

TABLE 2
AGE GROUP OF EMPLOYEES [3]

Sr. no.	Age group (yrs.)	No of Employee	%
1	21-25	33	27.5
2	26-30	48	40.0
3	> 30	39	32.5
	Total	120	100

The result of the survey is shown in Fig 2, comparing mean of all six factors, it is found that "Dissatisfaction with monetary compensation" is top most factor for employee to leave the current job, which then is followed by "Lack of Recognition" then "Dissatisfaction with other facilities" is the least influencing factor.

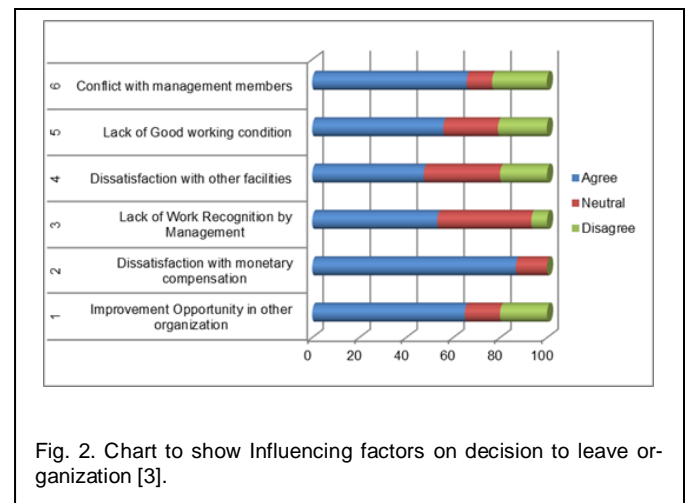


Fig. 2. Chart to show Influencing factors on decision to leave organization [3].

Comparing both the case study presented in this section we can say that both have successfully achieved their desired goal. First case used COTS product for attrition prediction and were happy with the results. Second case was a survey conducted to find out the most influencing factor to leave the current job.

5 ATTRITION PREDICTION SOLUTION

There is vast amount data available in every organization. Its Ability to collect and analyze data and then make appropriate decisions based on the data has grown enormously of late. with the kind of knowledge, software's available, domain expertis and data scientist in every organization today we are able to make a right predictive analysis. We have seen this in few case study presented above. Therefore we suggest a novel data driven model, supported with domain knowledge and expertise which will predict attrition through machine learning algorithm. This system will also predict what is the major root cause of employee being unhappy with the organization. This is highly useful to HR where they can focus only on the main root cause/causes when dealing with the employee.

Below are solution steps which can be used to predict attrition.

- First identify the features (variables / attributes) within data available which is likely to impact attrition.
- Select a model to predict employee attrition using the feature identified.
- Detect the most high contributor/factor for employee attrition.
- HR/Manager needs to work on the factor to reduce attrition or decide on backfill depending on the cost factor.
- HR/Manager's domain knowledge skill is leveraged to provide feedback to model for improvement in future prediction. This is how the model learns to increase the accuracy.

This solution currently suggested above is in theory. The future scope of this work is to actually make a working tool based on the above solution.

6 RETENTION STRATEGY

Once the high risk employees are identified then is next step starts on how to retain those employees. There are two ways to do this first is target entire organization as whole, Like an apt HR who devices the policy which motivates employee. Time to time they initiate a connect program with the organization which creates a bind relationship between employee and the organization. Ease some of the policies, announce bonuses when the company is doing well. Build the brand value of the organization as this attracts employees. Create leaders who are role model. Reward high performer.

The second strategy starts when we actually know that the employee is leaving or at-least when we get the hints from the tool which we build, that employee has intention to leave. Then HR comes into picture and in line with his current manager, together they strategize retention plan for that employee depending on the factor which is most important to the employee predicted from the tool. Few are stated below.

- Increase in the compensation.
- Role change
- Onsite opportunity.
- Choice location transfer.
- Project/client change.
- Training, Skill development.
- Addressing personal grievance.

These are good amount of retention strategy, however there is still few employees who will leave. A good and apt manager will always have to mitigate this risk by identifying a backup resource training these resource and slowly giving him the responsibility. First step is to prepare a comprehensive domain and technical knowledge transfer plan. Next, making sure that these knowledge are transferred to the new employee within time and new employee is able to work on his own.

7 CONCLUSION

In conclusion, we would like to say that we have achieved the goal of defining the problem of attrition clearly, and its adverse impact. With help of case study we have shown how attrition prediction tool is useful to organization. In line with most common attrition prediction tool we have devised a solution where our solution will not only predict attrition but will also give the factor or most common causes why the employee is ready to quit. At the end we have given very common retention strategy which is in line with the factors predicted through prediction tool.

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