

ANALYSING ATTRITION IN OUTSOURCED SOFTWARE PROJECT

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ABSTRACT

Information systems (IS) outsourcing has grown as a major business phenomenon, and widely accepted as a business tool. Software outsourcing companies provide expertise, knowledge and capabilities to their clients by taking up the projects both onsite and offsite. These companies face numerous challenges including attrition of project members. Attrition is a major challenge experienced by the outsourcing companies as it has severe impact on business, revenues and profitability. In this paper, attrition data of a major software outsourcing company was analysed and an attempt to find the reason for attrition is also made. The data analysis was based on the data collected by an outsourcing company over a period of two years for a major client. The results show that the client initiated attrition can have an impact on project and the members quit the outsourcing company due to client initiated ramp down without revealing the reason.

KEYWORDS

Software engineering, Project Management, Attrition, Software Outsourcing, Software Project.

1. INTRODUCTION

A successful software project can be attributed to rightly managing three critical factors – people, process and technology [1]. While the process and technology used largely influences the schedule, the quality and the productivity of the project, the people factor directly impacts the revenue and profitability of the project [2]. People leave the project for various reasons and every project member leaving the project will result in ‘attrition’. As people develop skills and gain knowledge when they work through the different life cycle stages of the project, the attrition in the project will result in loss of skills and knowledge [3]. It takes a great deal of effort and time to rebuild that skills and knowledge to ensure that the project keeps running smoothly. Hence many project managers will maintain a small buffer of people who will pitch in whenever there is attrition in the project so that the project schedule, quality and productivity will not get impacted. However, the buffer of people will bring down the profitability of the project.

The attrition process in a software project is common and needs to be carefully managed [1]. In large size projects (both in terms of the number of people and the duration), the attrition manifests itself in two forms – one is the attrition initiated by the client due to budget constraints or non-performance of employees, and the other is the attrition initiated by the project members themselves either because they want to move out of the current project or they want to leave the company he/she is working for. In either of the cases, it is important to understand the nature of attrition and its impact on the project [4].

The project schedule and quality of project work largely depends on the stability of the project team members. If attrition in the project increases, there will be transference of knowledge from the outgoing project member to the incoming project member. This will introduce a delay in the project and if the transition is incomplete, the quality of the project work greatly suffers. Hence, the attrition factor in outsourced software project should be carefully considered while planning for a project.

The aim of this study is an attempt to understand whether there is any relationship between the client initiated attrition and the project member initiated attrition. It is also an attempt to understand whether the HR personnel are correctly capturing the reasons for any employee quitting the company during the exit interview. A large outsourcing organization of India was considered for the study from which a sample of 120 records over a period of 14 months was analysed.

2. LITERATURE REVIEW

According to Gopal et al. (2003), attrition largely impacts the profitability of a software project and hugely depends on the nature of the project contract signed. A project with a fixed price contract will impact the profitability due to higher attrition than a project with a time and material contract. The role of a person in the project also impacts profitability. A project manager leaving in the middle of a project with a fixed price contract will create more damage than a mere project member leaving the project. In a project with time and material contract, key software developers/leads can create more damage to the projects than the project manager himself.

According to Reel (1993) any of the key people leaving the project is a loss, as some of the crucial knowledge that has been gained till then is lost. If the project analysts quit the project, then the business requirement knowledge is lost. Similarly, if the project managers leave the project, the project process knowledge is lost. If the programmers quit, the pace of development will slow down. The best practices and lessons learnt during the project execution are largely held with the project team members. Unless all the knowledge that is gained during project execution is documented, this knowledge will be lost along with the people and takes a similar time period to be re-built [7].

According to Sundararajan et al. (2013) IT skills are very critical to the success of software projects. Companies spend a lot of money and time to build IT skills among its staff to prepare them to deliver successful software projects. Investing in FTEs (Full Time Employees) will bring stability to workforce and hence better quality of delivery. However, Jones (1994) highlights that the higher rate of attrition higher the risks associated with a project. Some companies choose to outsource a part of the project work to contractors or vendors. While outsourcing is one of the strategies for mitigating the risk related to attrition, the outsourced work will not automatically guarantee good quality of work. Accountability for the work done becomes a bigger issue to handle in such situations.

Knowledge management (KM) is one of the key aspects of handling the continuity of business, in wake of growing attrition in the software industry. It is one of the solutions to the problem arising out of the staff attrition. It also helps in improving re-usability and hence the productivity of the staff. Companies can also use KM to improve their profitability. But KM calls for huge investments in infrastructure and a continuous push by the management to ensure that people contribute to the KM repository [10].

Staffing decisions in software projects is quite complex and needs to go through a structured process. Software projects will have to be delivered within budget, within schedule and with very high quality [11]. Sharm et al. (2010) in their paper states that a staffing model should be defined

for each type of software project and 'what if' scenarios should be analyzed to cover possible risks due to staff attritions throughout the life cycle of the project. The most estimation models consider staff allocation as one of the key ingredients to arrive at the right effort estimation and hence the total cost of the project. Before the start of any project, the staff profile, their experience levels, roles and productivity of each staff should be analyzed in detail to cover the attrition risk in projects.

In their work by Lacity and Hirschheim (1993) have found that factors like cultural differences, time zone differences, the quality of the staff, their knowledge retention and reuse impacting the productivity of outsourced work. In fact, many organizations feel that they have not achieved the real benefits of true outsourcing due to the above factors.

3. RESEACRH QUESTION

All the above studies are based on small samples, single cases, specific industries and project types, generalization might not be possible. In this study, 'attrition' is defined as any project member leaving / quitting the client project. The reasons for leaving the project may be on account of client initiation or by the project member's desire to quit. The client can ask the outsourcing company to reduce the project members in a team due to financial budget constraints or non-performance of the team members. In such cases, the outsourcing company takes the members out of the project and deploys the engineers in some other project. From the outsourcing company perspective, this may not be considered as attrition. However, the company has to make a decision whether to retain these members in the same project, without billing the client or deploy them into other projects. This has an impact on the overall profitability of the project. In other cases, the project members working at the client site quit the company altogether due to better opportunities or some other reasons. This is considered as a true attrition for the outsourcing company.

The objective of the research is to analyse the reasons for leaving a project, whether client initiated or employee initiated, are similar in nature or not. In addition, an analysis is done on the reasons given by the project members while quitting the company are same or different. Since attrition in a large project can impact the revenues and profitability of the project, this analysis helps companies in proper resource planning and retention.

Hypothesis 1 (H10): There is no difference between the sample mean of attrition caused due to the client initiation and the project member initiation.

The objective was to statistically test the significance of attrition data. T-tests were performed to confirm that the means of attrition in client initiated data were similar to the means of the attrition in members initiated data.

Hypothesis 2 (H20): There is no difference between the sample mean of attrition of employees joining another company and for personal reasons.

The objective was to statistically test the significance of attrition data. T-tests were performed to confirm that the means of attrition in client initiated data were similar to means of the attrition of members initiated data.

4. METHODOLOGY

In this study, the attrition dataset from a major outsourcing company from India was analyzed. The company is a global leader in consulting, technology, and outsourcing solutions. It has a

client base with more than 250 clients across 30 countries and with an employee base of more than 100000. For the study, the attrition data from one client was analysed. The outsourcing company had deployed more than 300 engineers at the client's site for a project. Whenever an employee left the project, the reason for leaving was recorded and collated on a monthly basis. A total of 120 records were available in the dataset. Out of the 120 records, after some data cleaning, a total of 106 employee records were analysed. The data was collected over a period of 14 months. The project members who left the project were programmers, programmer analysts, project managers, translators and UI designers. Every month, the attrition data was captured by entering the pertinent information regarding the project member, including whether the member was ramped down by the client, or the member had resigned from the outsourcing company. If the member had resigned, then further data from the exit interview was also recorded. In this dataset, only one reason was recorded – whether the exit was for personal reasons or for joining another company. In this study, as per the outsourcing company norms, any member leaving the project before 18 month is considered as attrition.

The descriptive data was analyzed using Statistical Package for Social Science (SPSS) Version 17, the statistical software package by IBM. SPSS is commonly used in the Social Science and in the business world [14]. IBM SPSS allows in-depth data analysis and preparation, analytical reporting, graphics and modelling (ibm.com). It is a Windows based program that can be used to perform data analysis, create tables, graphs and statistical data analysis. It is capable of handling large amounts of data and can perform visualization, ANOVA, t-test, Chi-square tests, F-test, and other statistical analyses.

Further, in order to analyze the data at a micro level and test the difference between two groups at a time, t-tests were conducted. The null hypothesis assumes that there is no significant difference in the means of the two groups, in other words, the sample mean of attrition initiated either by the client or the project members is the same.

5. RESULTS

The results of descriptive data on the study of attrition are important for the following reasons:

- 1). It enables a company to determine the compatibility of client initiated attrition and project member initiated attrition.
- 2). It enables to determine the reasons for attrition by members are the same or different.

The first part of the analysis is to identify whether the attrition of client initiation and project members' initiation are the same or different. The analysis was performed between two groups of data – client initiated attrition and project members' initiated attrition. The following Table 1 presents the descriptive data analysis:

Table 1. Attrition Statistics: Client and Members Initiated

	<i>Client Initiated</i>	<i>Member Initiated</i>
Mean	3.285714286	2.571428571
Standard Error	0.834875601	0.561730898
Median	2	1.5
Standard Deviation	3.123818458	2.101804562
Sample Variance	9.758241758	4.417582418
Pearson Coefficient	0.63	0.63

From the Table 1, it can be noted that the mean of client initiated is 3.25 persons per month with a standard deviation of 3.12 whereas the members initiated is 2.57 persons per month with a

standard deviation of 2.10 and both the groups are independent. Further, t-tests were conducted to compare the behaviour between the two groups, whether they are same or different. Whether the reasons for client initiated attrition and member initiated attrition are the same or they are different. Further, correlation coefficient was found to be 0.63.

Table 2. T-test: Client and Members Initiated Attrition

Groups	M	SD	t-value	p-value (two tailed)	Null Hypothesis
Client Initiated	3.28	3.12	1.099	0.29*	Fail to Reject
Member Initiated	2.57	2.10			

*Significance level = 0.05

A paired-samples t-test was conducted to compare client initiated attrition and members initiated attrition conditions. As shown in the Table 2, there was no significant difference in the scores for client initiated (M=3.28, SD=3.12) and members initiated (M=2.57,SD=2.10) conditions with t-value of 1.099 and p = 0.29. These suggest that there is not enough evidence to show that the attrition due to client initiated and attrition due to members initiated are different.

The second part of the analysis is to identify the reasons given by the members who resign (attrition) was to join the other company or some other reasons which is unknown. The analysis was performed between the two sets of data – reasons joining the other company and reasons that is unknown. The following Table 3 presents the descriptive data analysis:

Table 3. Attrition reasons: Joining other company and Unknown

	<i>Joining Other Company</i>	<i>Unknown</i>
Mean	0.92	1.64
Standard Error	0.304	0.487
Median	0.5	1
Standard Deviation	1.141	1.823
Sample Variance	1.302	3.324

From the Table 3, it can be noted that the mean of Joining Other Company is 0.92 persons per month with a standard deviation of 1.14 whereas the Unknown is 1.64 persons per month with a standard deviation of 1.82 and both the groups are independent. Further, t-tests, as shown in Table 4, were conducted to compare the behaviour between the two groups are same or different. Whether reasons for Joining Other Company and Unknown are same or they are different.

Table 4: T-test: Joining Other Company and Unknown

Groups	M	SD	t-value	p-value (two tailed)	Null Hypothesis
Joining Other Company	0.92	1.14	1.21	0.24	Fail to Reject
Unknown	1.64	1.82			

*Significance level = 0.05

A paired-samples t-test was conducted to compare Joining Other Company and Unknown conditions. As shown in the Table 4, there was no significant difference in the scores for Joining Other Company ($M=0.92$, $SD=1.14$) and Unknown ($M=1.64$, $SD=1.82$) conditions with t-value of 1.21 and $p = 0.24$. These suggest that there is not enough evidence to show that the reasons for Joining Other Company and reasons for Unknown attrition by members initiated are different.

6. DISCUSSION

The results indicate that there is no significant difference in the sample mean of client initiated and members initiated attrition. It can be inferred from the results that the client initiated ramp down can have significant impact on team members working on the project. Client initiated ramp down can result in demotivating the team as the other team members do not feel secure about their places in the project and hence not contribute to the best of their ability to the project and on the personal side, not gain proper experience or skills which would help in their career. From the results, it can be also inferred that the reasons given by the employees when they quit the company is not properly captured. T-test shows that there is no significant difference in the sample means of reasons for leaving the company.

Employees normally tend to quote 'pursuing higher education' as one of the main reasons for members initiated attrition. The companies tend to go soft on this aspect and do not insist on serving sufficient notice before relieving them from their duty. In other cases, employees quote 'personal reasons' which cannot be drilled down further as it would mean intruding in their privacy. In case of client initiated attrition, some employees will treat it as an opportunity to move on to new projects. But many employees will feel demotivated as their learning opportunity in their current project got terminated due to ramp down in the account.

Hypothesis 1 (H10): There is no difference between the sample mean of attrition caused due to the client initiation and the project member initiation.

Fail to reject as there is not enough evidence to show that the attrition due to client initiated and attrition due to members initiated are different.

Hypothesis 2 (H20): There is no difference between the sample mean of attrition of employees joining another company and for personal reasons.

Fail to reject as there is not enough evidence to show that the reasons for Joining Other Company and reasons for Unknown attrition by members initiated are different.

6.1 Managerial Implications

From project management perspective, the impact of attrition on the project profitability will remain the same irrespective of whether the attrition was initiated by the client or the project member. The project manager will have to factor in the risk associated with the attrition on the project output and accordingly handle his staffing plan to mitigate the risk. In case of client initiated attrition, the project member has the option to come out of the current project and move on to another project. Hence this attrition will not impact the attrition of the company. In case of project member initiated attrition, both the project and the company will suffer and the cost of mitigating the risk will be very high and hence will impact the profitability both the company and its client.

7. CONCLUSIONS

The study analyses the attrition in a project from an outsourcing company's point of view and the reasons behind the attrition. Further, the study shows that there is no significant difference between the client initiated and members initiated attrition. Similarly, in the case of the members initiated attrition, the reasons for leaving the company is not extensively captured by the company and all these could have an impact on the overall project. The study was limited to only one client because of data availability. This can be further extended to data from multiple clients and multiple projects. Also in the next stage of the study, detail analysis of exit interview answers will be analysed once there is a significant amount of data.

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