

Expectations of Software Engineers in Sri Lanka With Reference to Software Industry

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Abstract: *The worldwide shortage in software engineers has created a serious economic situation. It is projected that the current shortage in software engineers will increase in the future resulting in intense rivalry for skilled software engineers with the rivalry being further exacerbated by the expected continuous exponential growth in ICT. The main goal of this study was to understand expectations of software engineers in Sri Lanka*

Keywords - Intention to leave, pay and benefits, career development, self-achievement, environmental factors

1. INTRODUCTION

Software engineers can be defined as knowledge workers whose productivity determines the economic success of their respective organizations (Drucker, 2007). Software engineers' knowledge and importance are key factors for success in today's knowledge-based society. The main reason for the importance of software engineers in today's knowledge-based society can be attributed to the fact that software engineers' expertise cannot be replicated, and is a key source of competitive advantage and profitability for IT organizations (Jones & Miller, 2007). Given the importance of software engineers for organizational success it is imperative for software development organizations to develop effective strategies to retain these employees (Jones & Miller, 2007).

Research conducted by the Sri Lankan Information and Communication Technological Association (SLICTA, 2010) found that the country has a 42% annual shortage of IT professionals and a 13% attrition rate in the industry. And also it's a common concern by HR managers of IT companies. In order to mitigate these issues, it is vital for IT companies in Sri Lanka to identify expectations of software engineers in Sri Lanka. Identifying expectations of software engineers in Sri Lanka will enable these companies to develop strategies and plans to satisfy these expectations which in turn should contribute to the retention of these employees.

Human Resource Theories relating to Employee Expectations and Retention

The Job embeddedness theory is a retention new theory which uses both non-work and non-attitudinal factors to explain the reasons behind employee decision to leave or stay in an organization (Mitchell et al, 2001). The non-work factors are based on family and personal factors which are external to the job, and the non-attitudinal factors pertains to the personal attachment employees have to their fellow workers, social networks and leisure activities inside and outside of the job. According to (Harman et al, 2007) the firms have the ability to retain an employee by understanding his or her career aspirations and assisting him or her to achieve these aspirations. Sacrifice associated with leaving the firm relates to actual and perceived cost of material benefits that will be forfeited by employee if he or she decides to leave the firm (Holtom, et al., 2006). These material benefits can range from stock options, to profit sharing, career advancement opportunities, childcare support, flexible work arrangements, friendly and influential colleagues, etc. Motivation theory is a blend of psychological behavior which can be employed to encourage individuals to behave in a certain behavior (Stone, 2005). The financial factors such as salaries and bonuses only succeed in preventing job dissatisfaction has resulted in researchers such as Nelson and Todd (2004) and Stone (2005) positing that non-monetary factors such as personal growth opportunities, rewards and feedback, self-achievement, relationships with co-workers, etc., are more effective motivational tools than monetary factors. Review of literature indicates that self-achievement, career development, financial

compensation, job satisfaction and organization environment factors are key job related expectations which influence an employee's decision to remain with the organization.

Financial compensation factor includes the base pay and incentive pay. This plays a complex role in employees' attraction, retention, and motivation. Milkovich and Newman (2005) stress that pay elements are one of the most effective methods which can motivate employees to perform well and to adapt and master new technology and work process.

Career development opportunities pertain to the advancement, development and training opportunities for employees throughout their working careers (Nelson & Todd, 2004).

Self-achievement pertains to deep-seated career success and an employee's application of his own career actualization. According to Woodruffe (1999) a sense of recognition and feeling appreciated has a significant influence on convincing employees to remain with their current organization.

Environmental factors consist of factors that employees appreciate about their external environment. According to Amar (2004) a positive work environment can motivate employees to behave in a consistent manner and be focused on achieving their organizational goals and objectives. Developing a positive work environment is significantly dependent on the leadership style of managers, degree of autonomy employees has to do their jobs, and work-life balance. Leadership style can enhance an employee's satisfaction with the job which in will result in lower employee turnover intentions (Chen & Silverthorne, 2005).

Autonomy is considered an important structural element in motivating software engineer behavior as it provides authority for decision-making (Davenport, 2005). For instance, employees in the exploration stage of their career might want additional decision making responsibilities in technical areas rather than administrative areas. The more opportunities employees have to be involved in the decision making process, the more likely their investments in the projected will be associated with self-achievement (Messmer, 2006).

Challenging work is one significant factor that naturally attracts and retains software development employees in the IT industry as this is a strong motivator to influence their attitudes to work and

participate (Lock, 2003; Milliman, Czaplewski, & Ferguson, 2003; Smith & Rupp, 2002).

An innovative and creative culture is believed to be highly related to the intrinsic motivation that attracts employees to stay in the organization (Jaskyte&Kisieliene, 2006).

2. OBJECTIVES OF THE STUDY

The main objectives of this study are as follows:

- I. To investigate software engineers' job related expectations which influence their intention to stay in the current organization
- II. To identify software engineers level of intention to remain in the current organization

3. CONCEPTUAL MODEL

As illustrated the software Engineers major expectations work-life factors i.e. pay and benefits, career development opportunities, self-achievement, environmental factors, degree of autonomy, challenging work and organizational culture are the Independent Variables in this study, whilst employee intention to stay in the current organization is the dependent variable.

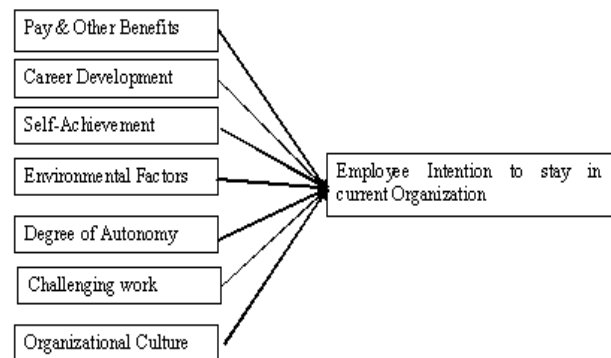


Figure 1 Conceptual Framework

4. METHODOLOGY

The quantitative research design has been employed as it is the most suitable design to test the hypotheses and understand the relationship and impact the independent variables in this study. The sample population size 378 was selected from the software companies located in Colombo, Sri Lanka

using a simple random sampling method. Primary data has been collected from a structured self-administered questionnaire. All the hypotheses were tested against a significance of 0.05.

5. HYPOTHESIS

Several hypotheses were developed to address the main and the sub research questions.

H1₁: Pay and other benefits have an influence on software engineer's intention to stay in the current organization

H2₁: Career development expectations have an impact on software engineer's Intention to stay in the current organization.

H3₁: Self achievement has an impact on software engineer's intention to stay with the current organization.

H4₁: Environmental factors have an impact on software engineer's intention to stay in the current organization.

H5₁: Degree of Autonomy has an impact on software engineer's intention to stay in the current organization.

H6₁: Challenging work has an impact on software engineer's intention to stay in the current organization.

H7₁: Organizational culture has an impact on software engineer's intention to stay in the current organization.

6. DATA ANALYSIS

Software Engineers' in Sri Lanka Intention to Leave the Company

Q25, 26, 27, 28 questions were selected to refer the software engineers' intention to leave the company based on the reliability and factor analysis [Table 1] and the [Table 2] illustrates the intension of Software engineers' in Sri Lanka to leave the current company.

Reliability Statistics

Cronbach's Alpha	N of Items
.856	4

Table 1: Reliability Analysis for Software Engineer Intention

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	25	8.3	8.3	8.3
Disagree	120	40.0	40.0	48.3
Neither	130	43.3	43.3	91.7
Agree	20	6.7	6.7	98.3
Strongly Agree	5	1.7	1.7	100.0
Total	300	100.0	100.0	

Table 2: Software Engineers' Intention to Leave the Company

The correlation between job related expectations and the intention to stay in the company

Four questions have been developed under this category [Table3] and the mean obtained was 3.40 which was a high value and implies that pay and other benefits has a significant influence on software engineer's decision to stay in the current organization.

Reliability Statistics

Cronbach's Alpha	N of Items
.773	4

Table 3: Reliability Analysis for Pay and Other Benefits

Question No	Mean	Std. Deviation
1	3.27	.728
2	3.23	.784
3	3.38	.778
4	3.72	.799
	3.40	0.77

Table 4: Pay and Other Benefits impact

Table 5 shows the correlation between pay and other benefits and employee intention to stay in the company. This relationship is statistically significant as the p value at 0.000 is less than the level of significance of 0.05. Therefore, the null hypothesis H10 has been rejected and the alternate hypothesis H11 has been accepted.

		Employee Intention to Stay	Pay and Other Benefits
Employee Intention to stay	Pearson Correlation	1	-.402
	Sig. (2-tailed)		.000
	N	300	300
Pay and Other Benefits	Pearson Correlation	-.402	1
	Sig. (2-tailed)	.000	
	N	300	300

Table 5: Correlation between Pay and Other Benefits and Employee Intention to stay in the Company

To analyze the influence of career development opportunities on software engineer's intention to stay in the current organization there were four questions developed. The mean obtained was high (3.53) which imply that career development opportunities have a significant influence on software engineer's intention to remain in the current organization.

Question No.	Mean	Std. Deviation
5	3.48	.993
6	3.42	.901
7	3.33	1.029
8	3.90	.791
	3.53	0.93

Table 6: Career Development Opportunities Impact

		Employee Intention to Stay	Career Development
Employee Intention to stay	Pearson Correlation	1	-.546
	Sig. (2-tailed)		.000
	N	300	300
Career Development	Pearson Correlation	-.546	1
	Sig. (2-tailed)	.000	
	N	300	300

Table 7: Correlation between Career Development and Employee Intention to stay in the Company

The P value in the above table was less the level of significance the null hypothesis H20 was rejected and the alternate hypothesis was accepted.

Q9, 10, 11, 12 were developed to analyze relationship between self-achievement and software engineer's intention to stay in the current

organization. The mean obtained from these four questions was high (3.62) which imply that self-achievement has a significant influence on software engineer's intention to remain in the current organization. Based on the P value the null hypothesis was rejected.

Three questions were developed to analyze relationship between environmental factors and software engineer's intention to stay in the current organization. The mean obtained from these four questions was high (3.98) which imply that environmental factors have a significant influence on software engineer's intention to remain in the current organization. Based on the P value the null hypothesis was rejected.

Question No.	Mean	Std. Deviation
13	3.98	.720
14	3.98	.720
15	4.00	.776
	3.98	0.59

Table 8: Environmental factors impact

Q16, Q17 were developed to analyze the relationship between degree of autonomy [Table 9] and software engineer's intention to stay in the current organization. The mean obtained 3.58 is high and this implied that degree of autonomy has a significant influence on software engineer's intention to remain in the current organization. Based on the P value the null hypothesis was rejected.

Q18, 19, 20, 21 were developed to analyze the relationship between challenging work and software engineer's intention to stay in the current organization [Table 11]. The mean obtained from these four questions was high (3.80) which imply that challenging work has a significant influence on software engineer's intention to remain in the current organization. This relationship was statistically not significant as the p value at 0.196 is greater than the level of significance of 0.05. Given that p value was greater than the level of significance hypothesis H60 was not rejected.

		Employee Intention to Stay	Training and Development Opportunities
Employee Intention to Stay	Pearson Correlation	1	.075
	Sig. (2-tailed)		.198
	N	300	300
Training and Development Opportunities	Pearson Correlation	.075	1
	Sig. (2-tailed)	.198	
	N	300	300

Table 10: Correlation between Challenging Work and Employee Intention to stay in the Company

Q22, 23, 24 were developed to analyze the relationship between organizational culture [Table 12] and software engineer's intention to stay in the current organization. The mean obtained from these four questions is high (3.50) which imply that challenging work has a significant influence on software engineer's intention to remain in the current organization. Based on the P value the null hypothesis was rejected.

Impact of Independent Variables on Dependent Variable

According to the table [13], career development opportunities and organizational culture significantly affect the intention to leave. These are at $P < 0.001$ significant level. Degree of Autonomy significantly influence the intention to leave at $P < 0.05$ significant level. Pay and other benefits significantly influence the intention to leave at $P < 0.10$ level.

7. RESULTS

Findings from this study indicate that a majority of software engineers (48.3%) intend to leave their current organization in the near future, whilst only 8.4% indicated commitment to their present company over the short to medium term. Furthermore, the study reveals that career development is the most important expectation, followed by followed by pay and benefits, environmental factors, self-achievement, challenging work, organizational culture and employee autonomy.

8. CONCLUSION

In order to reduce software engineers' turnover intentions IT companies in Sri Lanka will need to implement the following:

Given the strong impact career development has on employee turnover intentions, IT companies in Sri

Lanka should understand the career aspirations of each individual software engineer and assist them to achieve these career goals. In this regard IT companies should implement comprehensive employee development plans for software engineers' as these employee development plans will enable IT companies to identify these employee career goals and objectives, and assist them in achieving these goals and objectives.

IT companies in Sri Lanka should focus on enhancing the current pay and other benefits of these employees in order to retain their services. Given the impact work-life balance is a key environmental factor influencing software engineers' decision to leave or remain with the organization, IT companies in Sri Lanka should focus on ensuring a proper work-life balance for software engineers.

Research findings indicate that software engineers are motivated by technical challenges of the job, and dislike the jobs which are routine and monotonous. Therefore, the companies should focus on job rotation, job enrichment, etc., in order to constantly increase the complexity and challenge of software engineers' tasks and responsibilities.

Recommendations for Future Research

In terms of recommendations for future research, future research should be carried out in the following areas:

- Failure to retain software engineers' impact on the competitiveness, productivity and profitability of Sri Lanka IT companies.
- High software engineer employee turnover impact on the recruitment and remuneration cost of IT companies in Sri Lanka
- Job related expectations influencing employee intention in different types of IT companies in Sri Lanka, Multinational IT companies, local companies, etc.

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10. APPENDIX A: SAMPLE QUESTIONNAIRE

1. I feel I am being paid a fair amount for the work I do.
2. The remuneration I received is in line with industry remuneration standards
3. I am satisfied with the other financial benefits I receive for the work I do
4. I am satisfied with the non-financial benefits I receive for the work I do
5. There are clear career development opportunities for me in the organization
6. The organization has a strong history of promoting people based on performance
7. The organization invest significantly in my training and development
8. The knowledge and experience I gain from working with my co-workers and supervisors will significantly enhance my professional development
9. Self-achieve I am reward and recognized for outstanding work
10. My supervisor rarely compliments my work
11. I feel the organization gives me due recognition and reward for my work
12. Those who do well on the job stand a fair chance of being promoted
13. My supervisor is fair in his dealings with me
14. I have an excellent work relationship with my supervisor
15. My job allows me to enjoy a good work-life balance

16. I am given meaningful projects in line with qualifications and experience
17. I am given the technical freedom to carry out the projects assigned to me as I see fit
18. I feel motivated when I am given work which challenges my technical competence
19. I feel motivated and challenged when the projects I am assigned tax my skills and knowledge
20. I like routine day-to-day projects
21. I like work which doesn't require me to enhance my knowledge and expertise
22. My organization encourages employees to use cutting edge software in all projects
23. Innovation is reward and recognized in the company
24. Risks taking in project development is tolerated to a great extent in my organization
25. I do not plan to leave the organization in the near future
26. I will quit the organization in the next 1 year
27. I do not plan on leaving the organization soon.
28. I may leave this organization before too long.

Cronbach's Alpha	N of Items
.770	3

Table 12: Reliability Analysis for Organizational Culture

Model	Coefficients ^a							
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
1 (Constant)	4.984	.372		13.403	.000			
Pay and Other Benefits	-.178	.099	-.099	-1.775	.077	-.440	-.103	-.077
Career Development Opportunities	-.884	.097	-.871	-9.113	.000	-.819	-.470	-.397
Self-Achievement	.096	.109	.071	.882	.379	-.440	.051	.038
Environmental Factors	.045	.101	.027	.442	.659	-.248	.026	.019
Degree of Autonomy	-.180	.074	-.149	-2.450	.015	-.428	-.142	-.107
Organizational Culture	.345	.075	.239	4.602	.000	-.173	.260	.201

a. Dependent Variable: Employee Intention to leave the Organization

Table 13: Impact of the Independent Variables on Software Engineers' Intention to Leave the Company

Reliability Statistics

Cronbach's Alpha	N of Items
.792	2

Table 9: Reliability Analysis for Degree of Autonomy

Reliability Statistics

Cronbach's Alpha	N of Items
.053	4

Table 11: Reliability Analysis for Challenging Work

Reliability Statistics