

**IDENTIFYING FACTORS AFFECTING JOB RISK OF
SPECIALIZED SOFTWARE DEVELOPERS IN
SRI LANKA**

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Degree of Master of Business Administration in Information Technology

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The dissertation was submitted to the Department of Computer Science and Engineering of the University of Moratuwa in partial fulfilment of the requirement for the Degree of Master of Business Administration in Information Technology.

Department of Computer Science and Engineering

University of Moratuwa

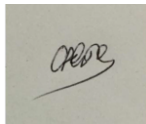
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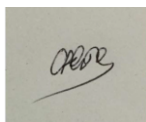
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ABSTRACT

A Specialized developer is defined as a person who use dialects which are not ordinarily utilized in the Sri Lanka. The other fact is that they work for an explicit structure where it's not utilized in somewhere else except if for the specific organization or association itself, which makes it extraordinary and unprecedented with different developers, this could be the specific organization inbuilt or it very well may be ERP framework which isn't usually utilized. In any case, workers have some job risk once they need to move out of their current positions. Now and again they can't get a new line of work identified with their experience which they acquired from the past organization. Accordingly, this exploration intends to find the elements affecting to developer's job security when they work in such conditions. There are less studies made about this subject area at the present.

In view of the writing of specialized developers and job security of the software professional, a portion of the components are recognized by the sources. The pilot review had been led to recognize the primary risk factors which could effect on the positions of Specialized Software developers in Sri Lanka. Income level, Availability of job opportunities, Labor market competition, extended learning, and job satisfaction are the variables researcher has been considered within this study.

The quantitative investigation measure had been viewed as an investigation method within this research. Henceforward an online study review is passed among the 200 employees which randomly selected from the software development organizations in Sri Lanka. Before circulating, the researcher has done a dependability examination to research the quality and internal consistency of the requests. Descriptive analysis is utilized to portray the vital properties of data in the exploration study. And the Pearson correlation coefficient is used to test the speculation of the exploration.

Additionally, to survey the impact of independent factors, the researcher has done the regression analysis. As an overview of the examination, it reflects the relationship between the independent and dependent factors. As indicated by the outcomes of the analysis, the lack of job security has most elevated positive critical relationship with availability of job opportunities, extended learning and job satisfaction.

And further research could be carried out to do more research on the captioned area as it will be beneficial for the future of the specialized software developers all around the world.

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TABLE OF CONTENTS

DECLARATION	i
COPYRIGHT STATEMENT	ii
ABSTRACT.....	iii
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS.....	vi
LIST OF FIGURES	ix
LIST OF TABLES	x
LIST OF ABBREVIATIONS.....	xii
1 INTRODUCTION	1
1.1 Chapter Overview	1
1.1.1 Background and Motivation	1
1.1.2 Research Scope	3
1.2 Research Problem Statement.....	3
1.3 Objectives of the Research	6
1.3.1 Research Questions	6
2 LITERATURE REVIEW	8
2.1 Lack of Job Security.....	8
2.2 Employee Income.....	10
2.3 Availability of Job Opportunities	11
2.4 Labour Market Competition.....	12
2.5 Extended Learning	14
2.6 Job Satisfaction	16
3 RESEARCH METHODOLOGY	19
3.1 Introduction to the methodology chapter	19
3.2 Conceptual Framework	19
3.3 Operationalization	20
3.4 Hypothesis Development	21
3.5 Research Design	22
3.5.1 Research Philosophy	22
3.5.2 Research Approach	23
3.5.3 Research Strategy.....	23

3.5.4	Types of the Study: Descriptive and Explanatory	24
3.6	Population and Sampling	24
3.6.1	Population	24
3.6.2	Sampling	25
3.7	Pilot survey.....	25
3.8	Method of Data Collection.....	25
3.9	Data Analysis Methods	26
3.9.1	Descriptive statistical analysis	26
3.9.2	Pearson correlation coefficient analysis.....	27
3.9.3	Regression Test analysis	27
4	DATA ANALYSIS	28
4.1	Introduction	28
4.2	Descriptive analysis of Demographic data.....	28
4.2.1	Service time in the software industry.....	28
4.2.2	Current Job Position.....	29
4.2.3	Income Category	30
4.2.4	Employment Type.....	31
4.2.5	Service time in the current organization	32
4.2.6	Number of Organizations worked.....	33
4.2.7	Gender.....	34
4.2.8	Age	35
4.2.9	Preferred geographical area	36
4.2.10	Learning opportunities provided by Employers.....	37
4.3	Frequency Analysis	38
4.3.1	Income Level – Frequency Analysis.....	38
4.3.2	Availability of Job Opportunities – Frequency Analysis.....	39
4.3.3	Labour Market Competition – Frequency Analysis.....	40
4.3.4	Extended Learning – Frequency Analysis	41
4.3.5	Job Satisfaction – Frequency Analysis	42
4.3.6	Job Security – Frequency Analysis.....	43
4.4	Reliability Test	44
4.4.1	Income Level – Reliability Test.....	44
4.4.2	Availability of Job Opportunities – Reliability Test.....	44

4.4.3	Labour Market Competition – Reliability Test.....	45
4.4.4	Extended Learning – Reliability Test	45
4.4.5	Job Satisfaction – Reliability Test	45
4.4.6	Job Security – Reliability Test	46
4.5	Correlation Analysis.....	47
4.6	Multiple Regression Analysis	49
4.7	Hypothesis Test Summary	51
4.8	Discussion	53
5	RECOMMENDATIONS AND CONCLUSION	55
5.1	Limitations of the research.....	59
5.2	Recommendations for future research.....	59
6	REFERENCES	60
	Appendix A - DESCRIPTIVE STATISTICS	66
	Appendix B - QUESTIONNAIRE INSTRUMENT	79
	Appendix C - PILOT SURVEY QUESTIONNAIRE.....	84

LIST OF FIGURES

Figure 1-1 Professional software developers by region.....	4
Figure 1-2 Working status of worldwide software developers	4
Figure 3-1 Conceptual Framework	20
Figure 4-1 Service time in the software industry	29
Figure 4-2 Current Job Position	30
Figure 4-3: Income Category	31
Figure 4-4 Service time in the current organization	32
Figure 4-5 Number of Organizations worked	33
Figure 4-6 Gender	34
Figure 4-7 Age	35
Figure 4-8 Preferred geographical area.....	36
Figure 4-9 Learning opportunities provided by Employers.....	37

LIST OF TABLES

Table 3-1 Operationalization Table	20
Table 3-2: Hypothesis Development	21
Table 4-1 Service time in the software industry	28
Table 4-2 Current Job Position	29
Table 4-3: Income Category	30
Table 4-4: Employment Type	31
Table 4-5: Service time in the current organization.....	32
Table 4-6: Number of Organizations worked	33
Table 4-7: Gender	34
Table 4-8: Age	35
Table 4-9: Preferred geographical area.....	36
Table 4-10 Learning opportunities provided by Employers	37
Table 4-11 Income Level – Frequency Analysis	38
Table 4-12: Availability of Job Opportunities – Frequency Analysis	39
Table 4-13: Labour Market Competition – Frequency Analysis	40
Table 4-14: Extended Learning – Frequency Analysis.....	41
Table 4-15: Job Satisfaction – Frequency Analysis.....	42
Table 4-16: Lack Of Job Security – Frequency Analysis	43
Table 4-17 Income Level – Reliability Test	44
Table 4-18: Availability of Job Opportunities – Reliability Test	44
Table 4-19: Labour Market Competition – Reliability Test	45
Table 4-20: Extended Learning – Reliability Test.....	45
Table 4-21: Job Satisfaction – Reliability Test.....	45
Table 4-22: Lack of Job Security – Reliability Test	46
Table 4-23: Correlation Analysis	47
Table 4-24: Variables Entered/Removed.....	49
Table 4-25 Model Summary	49
Table 4-26: ANOVA.....	49
Table 4-27: Coefficients	50
Table 4-28 Hypothesis Test Summary.....	51

Table A-1 Income level Question 1 - Descriptive Statistics.....	66
Table A-2 Income level Question 2 - Descriptive Statistics.....	66
Table A-3 Income level Question 3 - Descriptive Statistics.....	67
Table A-4 Income level Question 4 - Descriptive Statistics.....	67
Table A-5 Income level Question 5 - Descriptive Statistics.....	67
Table A-6 Availability of Job Opportunities Question 1 - Descriptive Statistics.....	68
Table A-7 Availability of Job Opportunities Question 2 - Descriptive Statistics.....	68
Table A-8 Availability of Job Opportunities Question 3 - Descriptive Statistics.....	69
Table A-9 Availability of Job Opportunities Question 4 - Descriptive Statistics.....	69
Table A-10 Availability of Job Opportunities Question 5 - Descriptive Statistics.....	69
Table A-11 Labour Market Competition Question 1- Descriptive Statistics.....	70
Table A-12 Labour Market Competition Question 2- Descriptive Statistics.....	70
Table A-13 Labour Market Competition Question 3- Descriptive Statistics.....	71
Table A-14 Labour Market Competition Question 4- Descriptive Statistics.....	71
Table A-15 Extended Learning Question 1- Descriptive Statistics	71
Table A-16 Extended Learning Question 2- Descriptive Statistics	72
Table A-17 Extended Learning Question 3- Descriptive Statistics	72
Table A-18 Extended Learning Question 4- Descriptive Statistics	73
Table A-19 Job Satisfaction Question 1- Descriptive Statistics	73
Table A-20 Job Satisfaction Question 2- Descriptive Statistics	73
Table A-21 Job Satisfaction Question 3- Descriptive Statistics	74
Table A-22 Job Satisfaction Question 4- Descriptive Statistics	74
Table A-23 Job Satisfaction Question 5- Descriptive Statistics	74
Table A-24 Job Satisfaction Question 6- Descriptive Statistics	75
Table A-25 Lack of Job Security Question 1- Descriptive Statistics	76
Table A-26 Lack of Job Security Question 2- Descriptive Statistics	76
Table A-27 Lack of Job Security Question 3- Descriptive Statistics	76
Table A-28 Lack of Job Security Question 4- Descriptive Statistics	77
Table A-29 Lack of Job Security Question 4- Descriptive Statistics	78
Table A-30 Lack of Job Security Question 5- Descriptive Statistics	78

LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
ICT	Information and Communications Technology
IT	Information Technology

1 INTRODUCTION

1.1 Chapter Overview

This investigation underscores the components which influence to work hazard of specific software developers in Sri Lanka. Therefore, this scope additionally furnishes information related with the foundation and inspiration of the research, research problem, research objectives, and the outcome of the analysis.

1.1.1 Background and Motivation

Technological specialization includes separating technology into its least level and planning occupations around each part. This creates specialization, mastery and improvement in quality. Software engineering also falls under that divided part. The field of information technology covers a broad range of jobs. Numerous individuals are anxious to start up a career based on Information Technology as it is an emerging field with numerous rewarding chances. Possibilities for headway are acceptable for talented individuals who stay up with the most recent innovation skills. Individuals ought to follow their inclinations and vocational objectives fundamentally while picking an IT specialization. It might likewise be useful to know about the current industrial demands, as advancement opportunities for computer software engineers tend to increase with experience.

Technological specialization in the working environment is as often as possibly seen where an employee revolves around a particular structure or language. Technological specialization permits a huge level of skill development in a particular region or language, thus improving quality and rapid creation.

Computer software engineers specialise on the standards and strategies for computer science, designing, alongside arithmetical inspection to the plan, advancement, testing, valuation of the software and the contexts that enable computers to play out their applications. Software engineers break down the customer requirements and design it to improve and keep up broad computer applications software or specific utility projects.

Regularly used programming languages are C, C++ and Java are also commonly used. Some programmers create both packaged software and systems software or generate customized applications.

Beyond delicate abilities, computer engineers additionally create both specialized and industry-explicit variety of skills that can be applied to all vocations in computer engineering and other related areas of training, respectively. Technical abilities include programming dialects, computer equipment, programming, and system architecture, while industry-explicit abilities are affected by the vendor, industry, and company practices.

There are numerous types of computer software, that each requires an expert in dialects explicit to that layer. Software engineering is a quickly evolving field thus software training is accessible virtually by all learning foundations. Most software engineers keep on learning hands-on, as dialects and improvement conditions advance.

In general, software engineers have some expertise in computer dialects and advancement conditions. A few software engineers work unaccompanied; however, most team up with different experts by associating, gatherings and cooperating with each other to accomplish complex undertakings. For those who are keen on working as software designers and composing codes for applications and framework, turning into a computer developer could be a decent vocation move.

On the other hand, if employees specialize, they are automatically incurring an opportunity cost, means that they will not be eligible for other technologies. Specialization is common in the software industry, but an overspecialization to uncommon framework or language might be the issue when employees try to move to another company within Sri Lanka. It was noticed that employees with many years of experience found it difficult to transit to a new organization with their expertise in a specific specialization. Therefore, this study will find out the influencing factors for such employees.

Specialized developer is named as a developer who uses languages which are not commonly used in Sri Lanka. The other fact is that they work for specific framework

where it is not used elsewhere in other organizations, unless for the particular company or organization itself, which makes it unique and uncommon with the other developers. This could be the particular company inbuilt or it could be an ERP system, which is not commonly used within the country.

1.1.2 Research Scope

This research is mainly focused on the Sri Lankan IT industry. Therefore, a targeted sample is chosen from the Sri Lankan IT industry. Hence, the questionnaire was distributed distinctly among Sri Lankan IT experts.

1.2 Research Problem Statement

Technology specialization could be through a wide range of areas. This research focuses on software engineers' job specialization to specific tools, framework or language. Job opportunities are different in each country. Some companies develop software based on their own framework which is not used in other companies within Sri Lanka. There are few uncommon languages used within the Sri Lankan IT industry. However, in countries such as India and Singapore those rare languages usage is high compared to Sri Lanka. Most of the time, such framework is developed using basic common language (C, C++). It could be a combination of two more languages or one particular common language used to develop a company framework.

However, overspecialization could be a problem due to its narrow focus. As an example, a software service company may not have enough projects for employees who are specialized only in a certain language or framework. This is particularly a problem when employees master a tool chain that is heavily used in one company but not mainstream. If they are to leave the company, they are at the risk of difficulty in finding another job that may require the mastery of a different toolset. Such unemployment is a significant problem importantly when a company layoff its staff.

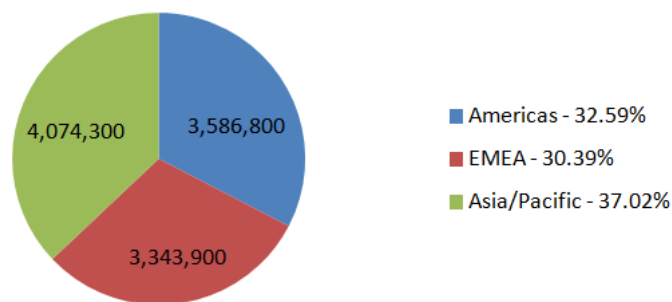


Figure 1-1 Professional software developers by region

Professional software developers by region (Source: IDC,2014)

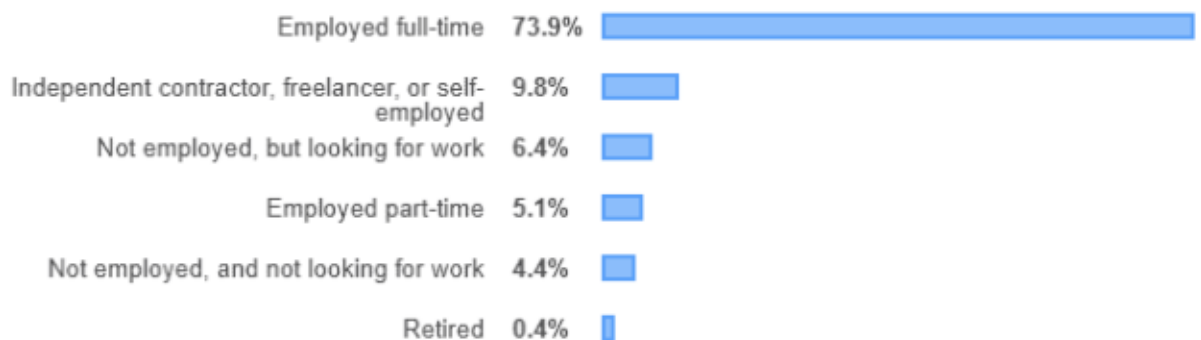


Figure 1-2 Working status of worldwide software developers

Working status of worldwide software developers (Sandra Göger,2020)

Then again, there are some other frameworks which learning and having expertise in that area is considered as a reward for employees. For example, SAP and Oracle are vaguely used in Sri Lanka, but these frameworks have very powerful demand in many countries and currently a widely used framework. Even in Sri Lanka, those frameworks have high demand and experience a very quick demand growth for these tools. However, having or building a company-specific framework with a combination of many languages could cause problems in moving to other jobs easily. For example, some language like Pega has many exams to be qualified as those are internationally recognized exams, but only in few counties Pega language is used and

it was started in Sri Lanka only by one company a few years ago. But, it is not growing in demand as they expected, because other software companies are not interested to initiate a partnership. If someday those employees leave that particular monopoly company, they have to face a big competition with other developers to find a software engineering job.

Job risk causes several problems which directly or indirectly affects wellbeing and personal life. This may cause mental fatigue, expanded expenses on medical services and negative perspectives toward one's self, work, and life itself. Not having an occupation or profession causes you to feel awful. Realizing that you cannot accomplish something great and cannot bring in cash for your abilities is an adverse inclination as it affects personal, financial, self-esteem, career and security. To overcome these problems, employee training and job rotation are important and this is considered as essential in the Information Technology industry as the toolsets change rapidly.

Specialization is the common behavior of the Information Technology industry. All employees are not involved in every task, and from an individual's perspective, simply learning what everyone wants cannot be a better solution. But after they move to an industry, sometimes they have to work within the environment which has monotonous work as the technology is changing rapidly. Therefore, sometimes they feel obtuse and they do not have the opportunity to learn new technologies because of the monotonous work.

On the other hand, there is no extreme specialization. When somebody favors one innovation over another and works with it more often than not, it only gives them their self-satisfaction. Thinking about the career path of a software engineer who is working as an employee in an organization, he should think whether the specialized area could be a threat to their career within Sri Lanka as a threat where the situation could be different in another country.

This research identifies factors that affect developers who worked in those product-based companies, where a framework is built by the company itself and also uses languages that are rare within Sri Lanka.

1.3 Objectives of the Research

Main Objective: To recognize the main risk factors which could impact the jobs of Specialized Software developers in Sri Lanka

Other Objectives

- To identify how the income level has impacted on lack of job security of Specialized Software developers in Sri Lanka
- To identify how the Availability of Job Opportunities has impacted on lack of job security of Specialized Software developers in Sri Lanka
- To identify how the Labour market competition has impacted on lack of job security of Specialized Software developers in Sri Lanka
- To identify how the Job satisfaction has impacted on lack of job security of Specialized Software developers in Sri Lanka
- To identify how the Extended Learning has impacted on lack of job security of Specialized Software developers in Sri Lanka

1.3.1 Research Questions

The main purpose of this study is to identify main risk factors which could impact the jobs of Specialized Software developers in Sri Lanka. To achieve this objective, as it was mentioned behind every framework or specialization, there are facts to be found impacting on severity of job risk after gathering selected employees' experience.

To achieve the objective, after gathering selected employees' experience, it has to be found out factors affecting job risk behind those frameworks or specialization.

- What are the job risks factors faced by specialized software developers in Sri Lanka?

- What is the impact of income level on lack of job security of Specialized Software developers in Sri Lanka?
- What is the impact of Availability of Job Opportunities on lack of job security of Specialized Software developers in Sri Lanka?
- What is the impact of Labour market competition on lack of job security of Specialized Software developers in Sri Lanka?
- What is the impact of Job satisfaction on lack of job security of Specialized Software developers in Sri Lanka?
- What is the impact of Extended Learning on lack of job security of Specialized Software developers in Sri Lanka?

2 LITERATURE REVIEW

Through this research, the researcher intends to identify factors affecting job risk of specialized software developers in Sri Lanka. With the objective of reviewing the already available very similar primary researches, it was found the literature was much limited. However, relevant literature has been found and reviewed from different industries in similar context. It was expected to examine carefully the practical applicability in the researcher's context of study, while being aware of the limitations in generalizing.

2.1 Lack of Job Security

Job insecurity is one of the main stress sources for individuals. The job insecurity can be referred as the situation where the employee is being threatened with the continuation and stability of his/her job. Job insecurity can be caused by certain economic, social, technical and political conditions in a country according to (Shoss, 2017). The study further reveals that job security can impact on motivation, stress, social exchange and coping proactively. The study done by (Reisel, et.al, 2014) observes the concept of occupation uncertainty and its relationship with career gratification, work behavior and adverse sentiments such as nervousness, resentment burnout, etc. The outcomes exposed that the relationship between the job satisfaction and job insecurity is negative. Further, the study exposed that there is a significant impact of job insecurity on employee emotions and work behavior.

Relationship between the job satisfaction and job insecurity was studied by (Zheng, et.al, 2014) and (Vujičić, et.al, 2014). Results indicated that job insecurity negatively influences on the job satisfaction.

(Beer, 2015) carried out a study with the purpose of examining the relationship between the job insecurity and career opportunities available in the market. This was based on South African employees and found out that less career opportunities

lead to more perceived job insecurity. The main factors affecting job insecurity in European countries were studied by (Hora, Horáková, & Sirovátka, 2016). The main variables identified were the income and learning opportunities. This study designates that there is a correlation between the learning opportunities and occupation insecurity, which is less significant. The study done by (Bustillo & Pedraza, 2010) evaluates the determinants of job insecurity and the factors identified were educational level and age. It was observed that age and educational level impacts the job security which is also an indicator of job opportunities. According to the study, when increasing age, the job insecurity also increases indicating a positive relationship. Increased educational level reduces the job insecurity as revealed by the study. Further, the job insecurity is minimal at the times when higher salaries are paid for the employees.

The study done by (Hootegeem & Witte, Qualitative Job Insecurity and Informal Learning: A Longitudinal Test of Occupational Self-Efficacy and Psychological Contract Breach as Mediators, 2019) examines the relationship between the job insecurity and informal learning. According to the study, job insecurity can also be explained as loss in the valuable job features in the present situation, which is the highest concern in anyones' work life. The researchers are studying three different informal learnings which are feedback seeking, informaton seeking and help seeking approaches. Self efficiency acted as a mediator in seeking the relationship between the two main variables. The findings prove that there is a lesser but yet a relationship between the job insecurity and informal learning in the workplace. The relationship between the job insecurity and learning through training was examinned by (Hootegeem, Witte, Cuyper, & Elst, 2018). The study was carried out in Belgium and according to the findings, it was found out that lower level of learning through training is more likely to gain higher risks in his/her job. Further, their percieved employability was weakening with reduced level of learning.

The study done by (Wickramasinghe & P. , 2011) examines the the many elements of social capital and how they aid software engineers working in Sri Lanka's offshore outsourced software development business in terms of knowledge

exchange, job opportunities and job security, and career progression. Important characteristics that substantially determine information sharing, job opportunities, job security, and career progression include social relations, the number of networks that individual is a part of, and the frequency of contact between network members which was revealed by the findings of the researchers.

2.2 Employee Income

The study done by (Shambrook, Roberts, & Triscari , 2012) examines the factors of educational level, experience, credentials and education and their impact on the income level. The study was carried out covering the research administrators. When referring to the educational level, it was discovered that it has an optimistic influence on the income level, where it was proved higher the educational level, higher the level of income. Then, in analyzing the experience in particular level, it was found out that it has a positive impact on the level of income of the employees. The workers who have a higher credential have had a better income than the other employees as discussed in the study. According to the study done by (MOROŞANU, 2012) reveals that the demographic factors such as age, gender, seniority and extraversion can impact on the employee income level.

When referring to the income level of the employees, there is an argument that employees migrate to a better country in search of a higher income. A study was conducted among the immigrants of New Zealand for working purposes by (McKenzie, Stillman, & Gibson, 2010). The causes for immigration were studied in the context of Tongan immigrants. Based on the study, it was revealed that the immigrants who were immigrating in a quota were not the same as mentioned in the lists. Further, it was found out that they migrate for a higher income. It can be argued that the low level of income in the source country could result in skill migration. Another study carried out by (Castro-Palaganas, et al., 2017) examines the reason for migrating by health workers in Philippines. According to the findings, the major problem caused for migration of health workers was the low income in the country.

As discussed by (Videt & Winter, 2014), the increasing competition in the labour market requires more competitive skills from the employees, which helps them to sustain in the current era and secure their employment. According to the report, it is proved that the increased labour market competition could result in job insecurity.

2.3 Availability of Job Opportunities

When analyzing the job opportunities available in the market, it is important to examine the consequences of the job opportunities. The availability of job opportunities, job satisfaction and employee turnover intention in Libya was studied by (Dardar, Jusoh, & Rasli, 2012). The factors of job satisfaction and availability of job opportunities were studied relating to job turnover. It was found out that availability of job opportunities has a positive influence on job turnover in Libyan oil companies.

The relationship between gender and career opportunities was evaluated by (Wynen, Beeck, & Ruebens, 2015) in the context of US federal workers. According to the findings of the study, it was revealed that the gender difference exists in the career opportunities in US. According to (Danell & Hjerm, 2013), women got fewer opportunities than men in the past. The study examines the gender differences on available career opportunities. Based on the study, it was evident that women get less career opportunities than men and fewer professional developments.

According to (Bardy, Rubens, & Eberle, 2017), the soft skills improve the level of job opportunities. The study highlights the importance of soft skills despite the educational qualification of the employees. The study done by (Bozick, 2009) examines the factors affecting job opportunities in US, and according to the study, it was revealed that the economic status and educational qualifications impact job opportunities of youth.

2.4 Labour Market Competition

A study carried out by Giannitsis and Kager (2009), emphasized that specialization advances the production of competitive advantages and influences straightforwardly on development, work, and remuneration. They underline new information mean esteem creation and is related with beneficial outcomes on financial as well as social performance. Due to employee specialization towards technology or a framework, whenever a client or consumer needs to build their product, adopting that rare technology in county will gain competitive advantage to that company. Alternatively, where the client no longer needs such technology to build their product, then somehow the employee has to protect their job otherwise the risk of job security. In the same study, authors further emphasized about formation of new logical information, new advancements, and the improvement of new prevailing and emerging technology territories. Besides, it is imperative to consider that new information and technology are not identified with specialization in a straight manner and specializations are not built distinctly from information inputs, but identified with mechanical change and advancements prompting new items and additional measures.

Boundless (2016) site indicated at the point when a nation has a similar benefit in progress, it can benefit by specialization and trade. Notwithstanding, specialization can have both optimistic and undesirable influences on a country's economy. Expanding gets back to scale for the creation of these merchandise, and they are aided by economies of scale. This article referenced the capacity of those involved in the production of a specific merchandise or a service at a lower peripheral and opportunity cost over another; therefore, they produce only specialized products. It effects on aggregative growth of economy as well. This also defined a general concept and when it is applied to technology specialization, employees have lower marginal and opportunity cost. This means the time taken to do the task is lesser when compared to a person who has no skills based on that job role. For an example, a developer can easily solve problems using their existing knowledge or usage of language but another unskilled employee needs training session or needs

to collect data related to task. Therefore, it gives competitive advantage in the technology industry as well. But, their existing knowledge on a rarely used language within the country or company, there could be job security issues. This article also represented how to mitigate such issues as a company.

The article by Scott W. Ambler (2014), indicated the effects of generalizing specialist. The author mentioned that to become an agile software developer that representative need to move away from being a barely engaged expert to be more of a summing up trained professional. Furthermore, he referenced a generalizing expert as somebody who has at least one specialized trained professionals or has, in any event, overall information on software advancement or has, at any rate, overall information on the business area where they employ. As per the author, generalizing specialists are regularly alluded to as craftspeople, "T-talented" individuals, multi-disciplinary developers, cross-useful engineers, profound generalists, polymaths, flexibility, or even "renaissance engineers". It demonstrated the generalizing expert is someone beyond a generalist or a trained professional.

Innovations in the working methods and behavior have been considered as a more important aspect in relation to competitiveness of the employee which could lead to labour market competition. On the other hand, it contributes in the growth of the companies as well in collaboration with the employees. In the current era, all the organizations and employees focus on surviving and growth in the highly volatile and innovative markets which leads to job insecurity (Niesen, et.al, 2018). According to the study, it was revealed that the innovative working behavior has a substantial association with the career security.

Job specialization can be regarded as one of the dimensions in the labour market competition, where the employees' personal skill capabilities are enhanced. The study done by (MAGALHÃES, 2020) examines the job specialization in software engineering. Job specialization enables the employees to improve the productivity and management of their work. Further, it improves the competitive position of the employees in the severely innovating labour market in the current era.

Competition in the ICT industry in China was studied by (Xiaobo, Wei, & Yueqi, 2013). According to the study, ICT industry is highly changing with new technologies in hardware and software. The Government is also involving in policy changes continuously. These changes would require further improvements in the job quality of the employees to retain competitiveness in the labour market. Employees would have to maintain their specialization and improve it further.

2.5 Extended Learning

World Bank report (2015) indicated that different investigations have shown that innovative change is normally expertise one-sided, in that its reception by businesses would profit laborers with higher abilities instead of the individuals who may be incompetent and recommended such one-sided abilities and technological change are not dull in its results. The author mentioned about a different aspect on technology specialization as it would not provide monotonous job role to employees. Based on the author's perspective, there is an uncommon benefit of technology specialization, but he had not mentioned what might happen when technology specialization provides monotonous job role. Nowadays, employees need abilities that are either to control technology or imaginative and not be subbed effectively by technology. Technology is controlled by humans and they need to adjust whenever technology changes happen. Author highlighted on the fact that polarization of the labour market has been well studied in a number of developed countries. These are important findings that provide some information to developing countries to follow up similar solutions found by developed countries when there is a decline in jobs associated with the middle class.

In the same study author said technology is changing the idea of work extensively, and mentioned changes have suggestions for work quality and income, but also for the kinds of risks people bear. However, types of risks to bear by individuals were not discussed.

The study done by (Jehanzeb & Bashir, 2013) examines the benefits of training

and development to the employees. According to the authors, training and development is a major source in gaining knowledge and skills for the employees benefiting the organizational performance as well. According to the findings of the study, training and development enables the employees to obtain technical and soft skills which are important in doing the job. In addition, companies facilitate in-the job training and other training programmes for the employees. This increases their performance and productivity.

Then again, training and development has been considered as a major learning source by (Richter, et.al, 2014). This is considered as a greater learning opportunity for the professionals by the authors. The organizations should engage their employees in training and development as an opportunity for extended learning. This facilitates in improving employee job satisfaction and performance. Further, according to (Boomaars, Yorks, & Shetty, 2018), learning opportunities has a positive relationship with the personal development of the employees. According to (Yee, Lee, Yeung, & Cheng, 2018), it is important to improve employee learning in the service industry, especially, since the industry is becoming dynamic.

(Kim, 2016) explained an analytical model of work specialization. The paper indicated in the new economy where labour demand is exceptionally specialized, broad human capital is pretty much as significant as serious human capital in light of the fact that there is a huge tradeoff between them. Though a specialist will be more gainful (thus command a higher wage) than a generalist in a restricted scope of assignments that require the specialist's ability, the possibility of getting a decent coordinating job might be more modest for the specialist. The author explained on the use of computer programmer, for example about a specialized person who takes more intensive, less extensive human capital and higher wage, which is also another benefit of the specialization. This study applied the findings to Information Technology (IT) industry. This study mentioned about specialization providing more intensive human capital because relevant job has high job risk. This type of employee has specific responsibilities that allow focus on a defined skill set. Employees were getting too centered

around a certain something that they do not get sufficient variety in their life and wear out decently fast. It is consistently a risk, particularly for the individuals who like change.

Research findings are as following,

- Normal expense of crisscross among laborers and occupations increase with the increment in size of the association's market fragment laborers, whose expertise attributes are like the association's work prerequisite. The normal match between a laborer and a firm improves.
- The ideal human capital of laborers will be specialized in a superior market
- More specialization additionally brings about a higher net pay for each laborer and larger firm sizes.
- Broad human capital is helpful in wage bargaining.
- Division of work subsequently impacts their human capital speculation decision.
- The employee's concentrated human capital rises, thereby the company's benefit will rise on account of the ascent in the laborer's efficiency

2.6 Job Satisfaction

In general, job satisfaction can be referred as the several negative and positive emotions about one's job. Further, according to (AZIRI, 2011), job satisfaction can be achieved when the rewards are higher or enough to the extent of his/her effort put in working. According to the study, the job satisfaction can directly influence on the employee motivation as well. Moreover, the study argues that satisfaction of the workers can enable the management to handle the employees better. Moreover, the

job satisfaction could achieve more employee productivity through improved motivation as well. The impact of working environment on job satisfaction has been studied by (Raziq & Maulabakhsh, 2015). It is a challenge for the employers to satisfy the employees in order to retain them longer and maintain the competitive position in the market. According to the study, it was revealed that the improved job satisfaction can result in improved employee productivity and organizational commitment. Further, the study revealed that more favorable working environment can increase the job satisfaction of the employees.

The study done by (Mishra & Farooqi, 2014) examines the relationship between the job satisfaction and employee performance management system in the IT industry. According to the authors, the performance appraisal system can be regarded as one of the major components in human resource management where the employees get evaluated based on their level of performance. Most of the employees in the IT industry can be categorized as knowledge workers and hence measuring their performance should be based on a complex performance measurement system. The employees seek advices and feedbacks from their supervisors in their multiple job roles. Hence the study reveals that more effective performance management system could improve the level of job satisfaction of the employees.

The study conducted by Nadya and Philip (2008) investigates on the factors that might influence Asian Americans' career choices. This is not an IT related study but related to university students' career choice. Thousands of students select wrong career choices due to many reasons. This research findings highlights on the factors which influence on the student choices. Main reason was the poor planning, and other factors examined were on level of assimilation, family Self-Efficacy Scores, family association, word-related interests, and vocation self-viability. In this examination, distinct measurements and relationship investigation of the factors were performed as a way of investigation to test if the estimated model clarifies why Asian Americans choose from limited occupations. Information was gathered via mailing or disseminating the bundle of instruments to expected members.

The study done by (Pelit & Öztürk, 2011) examines the impact of employee empowerment on employee job satisfaction. According to the study, employee empowerment has two dimensions which are behavioral and psychological. According to the results of the study, it was revealed that there is a significant impact on job satisfaction by employee empowerment. The work life balance and its association with the job satisfaction and organizational pride was studied by (Mas-Machuca, et.al, 2016). The work life balance was studied in two dimensions which are job autonomy and supervisor support. According to the study, it was revealed that the work life balance has a significant positive impact on the employee job satisfaction.

The factors affecting job satisfaction was studied by (Akter, et.al, 2017) in the garment industry. According to the study, employee job satisfaction was significantly impacted by working conditions, level of pay, level of stress and job security. Further, the age and designation was not significantly impacted on career gratification of the workforce according to the results.

The study done by (Hettiarachchi, 2014) examines the job satisfaction of the IT professionals in Sri Lanka and its impact on the job performance. According to the findings of the study, the factors of pay, promotion, supervision, work itself and performance impact on the job satisfaction of the IT professionals in Sri Lanka.

3 RESEARCH METHODOLOGY

3.1 Introduction to the methodology chapter

The methodology chapter includes the scientific methods and approaches which are used to carry out the research phase. Accordingly, this chapter mainly consists with conceptual framework, operationalization, hypotheses development, research design, sample size, sample selection procedure, population, data collection method and data analysis.

3.2 Conceptual Framework

The proper analysis can be done by using the proper literature survey and organized conceptual framework which are highly connect to the research substance. As a outcome of it, the origin of conceptual framework has additionally been set up and created. The highpoint of four main factors that effect on lack of job security of software developers has been laid down. Through the critically reviewed literature review following conceptual framework is developed which is also based on the objectives identified in the Chapter 01. Further done a pilot survey to clarify the variables as well.

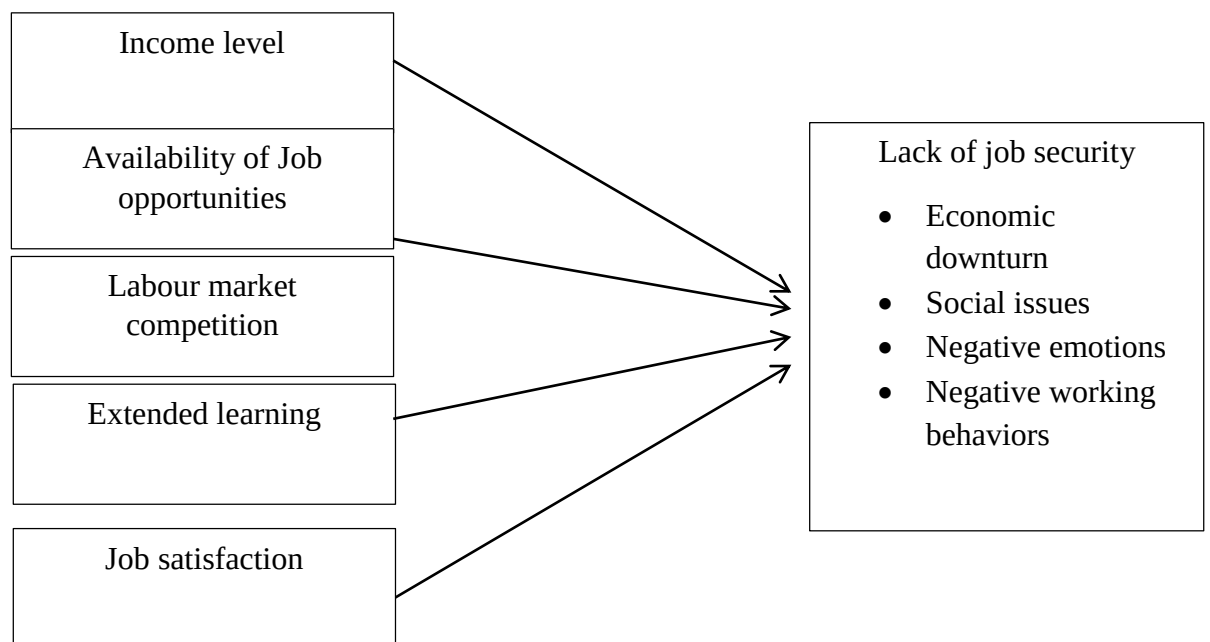


Figure 3-1 Conceptual Framework

Source: Developed by author, 2020

3.3 Operationalization

Table 3-1 Operationalization Table

Variable	Indicator	Authors
Income level (Independent Variable)	Tendency to immigrate	(McKenzie, Stillman, & Gibson, 2010).
	Educational Level Skill Level Level of Experience	(Shambrook, Roberts, & Triscari, 2012)
Availability of Job opportunities (Independent Variable)	Gender	(Wynen, Beeck, & Ruebens, 2015)
	Soft Skills	(Bardy, Rubens, & Eberle, 2017) (Bozick, 2009)
	Educational qualifications	
	Economic status of the country	
Labour market competition (Independent Variable)	Technical knowledge	(Giannitsis and Kager, 2009),
	Specialization	
	Innovative working behavior	(Niesen, et.al, 2018). (Xiaobo, Wei, & Yueqi, 2013).
	Innovative technologies	
Extended learning (Independent Variable)	Updated knowledge	(World Bank report, 2015)
	Continuous learning	
	Training and development	(Jehanzeb & Bashir, 2013)
	Technology updates	
Job satisfaction (Independent Variable)	Career choice	(Nadya and Philip, 2008)
	Quality of working environment	(Akter, et.al, 2017)
	Level of Pay	
	Level of stress	

	Job security	
Lack of job security/ Job Risk (Dependent Variable)	Economic downturns	(Shoss, 2017).
	Social issues	
	Negative emotions	(Reisel, et.al, 2014)
	Negative working behavior	

Source: Developed by Author, 2020

3.4 Hypothesis Development

A hypothesis is an all-around characterized, evident explanation that communicates what is examined while directing an examination. In speculations, there are two types. Alternative hypothesis and the null hypothesis. Alternative hypothesis is something contrary to the invalid one and it tends to be possibly reached if the null is dismissed. Therefore, ten theories have been characterized into two speculations by the specialist for this investigation for generalized factors.

The development of hypothesis has been made by recognizing the variables collected from the literatures. The hypotheses are accordingly significant to be verified with the working of the research so the investigation of information should be possible and the connection between the independent variable and dependent variable can be appropriately confirmed. The following hypothesis are made to answer the main research questions of identifying the main reasons for job risks and minimize those inefficiencies. Further according to the problem statement following hypothesis would test the reasons for job insecurity of software developers in Sri Lanka as well.

H_0 : null hypothesis

H_a : alternative hypothesis

Table 3-2: Hypothesis Development

H1	H_0	There is no impact of income level on software developers lack of job security
	H_a	There is an impact of income level on software developers lack of job security
H2	H_0	There is no impact of availability of Job Opportunities on software developers lack of job security

	H _a	There is an impact of availability of Job Opportunities on software developers lack of job security
H3	H ₀	There is no impact of labour market competition on software developers lack of job security
	H _a	There is an impact of labour market competition on software developers lack of job security
H4	H ₀	There is no impact of extended learning on software developers lack of job security
	H _a	There is an impact of extended learning on software developers lack of job security
H5	H ₀	There is no impact of job satisfaction on software developers lack of job security
	H _a	There is an impact of job satisfaction on software developers lack of job security

3.5 Research Design

The main objective of this research is to identifying suitable actions list which provide by the company to overcome or minimize risk behind their job opportunity. Research Design is generally based on the research onion model which is found by (Saunders, et al., 2016). This concept is used to build up the basic framework for the research. Further it guides the researcher with relevant theories, tools and techniques to build up the research. In addition, the research questions of gathering data, selecting the sample and analysis of data.

3.5.1 Research Philosophy

Research philosophy is guiding the researcher to select the most suitable method to carry out the research. The philosophies of positivism, realism, interpretivism and pragmatism are main categories of research philosophies. In this research study author is following the positivism philosophy since this research is based on set of collected data and hypothesis are build and the results are based on the observations of the data. Other methods do not follow these criteria.

3.5.2 Research Approach

There are two kinds of research approaches. First approach is inductive and second is a deductive approach.

- Inductive approach

Inductive theory is an approach to study that begins with the perception and the final product of the research is theory.

- Deductive approach

Deductive theory is an approach to research that begins with the suggestion of hypothesis and final product of the research is affirmation.

The research was conducted by using several steps. As the first step research find out the variables which are relate to the job security of software developers based on the critical review of literature. Based on the literature survey, researcher found the variables related with the issue and instruments were developed. As the second step a field survey will be conducted to gather data by the help of questionnaire.

Further on as the data collecting and data analyzing purposes researcher will be using the quantitative method for the study. Under the quantitative research strategy, the data will be gathered using the field survey using structured questionnaires. That strategy leads to the accurate findings since quantitative method is dealing with the numerical and statistical data sets.

3.5.3 Research Strategy

There are several strategies used in researches such as direct interviews, surveys, experiments, site visits and etc. Author has selected the survey method as the most appropriate strategy for this particular research study. The reason for the selection is primary data is collected from a selected set of respondents and their responds need to be gathered in a structured way.

3.5.4 Types of the Study: Descriptive and Explanatory

The research tries to identify the relationship of the variables and analyze what the factors are affecting on job security of software developers. Furthermore, through the research, researcher tends to investigate the demographical factors of the focused sample for the data analyzing purpose.

Moreover, the researcher is interested in finding out the correlation between independent variables (income level, labour market competition, extended learning and job satisfaction) and dependent variable (Job security). This research can be introduced as the descriptive type research, since researcher is attempting to quantify factors which created under the conceptual framework. Also, researcher is attempting to test the hypothesis that were created to clarify the association among Independent and Dependent variables, it is an informative kind investigation, as it attempts to clarify the association among factors

3.6 Population and Sampling

3.6.1 Population

The population of a research is recognized to identify the main parties targeted in the research and to identify the parties who involved as a source of primary data. In this research study author is targeting on the specialized software developers in Sri Lanka. According to (Kompass, 2020) the total count of product base computer programming and software developers in Sri Lanka is around 14,241. However, based on this study it is difficult to identify the referred specialized software developers (population) because there is no source for specialized developer count. Therefore, snowball sampling method is used for sample collection and data gathering.

Snowball sampling is a well-known, nonprobability method of survey sample selection that is commonly used to locate hidden populations. This method relies on referrals from

initially

sampled respondents to other persons believed to have the characteristic of interest (Johnson, T. P., 2014)

3.6.2 Sampling

For this research study using snowball sampling technique where the population is hard to reach for collecting data. The target population is specialized software developers who are hardly reachable and hence snowball sampling is used. The collected sample size is 200.

3.7 Pilot survey

Having this pilot survey, expect to improve the quality and productivity of the actual research study by identifying all variables and segment questions for the actual questionnaire. This pilot survey has been distributed among 25 specialized Software Engineers. Using this pilot survey response, researchers have identified Cronbach's alpha for respective questions to check the dependability of the questions.

3.8 Method of Data Collection

This research was based on both primary and secondary data. The job security of the software developers will be basically analyzing on essential information and the definitions and discussions of concepts on the literature, which incorporated the books, periodicals and journals and reports will be used as secondary information. The method of primary data collection will be data gathered from a questionnaire survey which is given to the selected sample of Information Technology employees in Sri Lanka. Google forms is used to conduct the survey online by the author.

To develop this questionnaire survey author carried out a pilot survey to identify the key factors affecting the lack of job security of the specialist software engineers. From the pilot survey questions, they agreed that the level of income is one of the most important concern in choosing and retaining in the job. Availability of the job

opportunities in the market is another concern in finding a job. One of the pilot survey question was whether the labour market competition impacts the level of job security of the specialist software engineers and they agreed for that factor as well. Further they agreed that job satisfaction and opportunities for learning are the other factors that affects job security of the specialist software engineers.

3.9 Data Analysis Methods

Data analysis can be considered as one of the most important tasks in a research where the author is evaluating the results gathered from primary and secondary data sources. In primary data collection detailed questionnaire was developed by author based on the findings from literature. The data collected from the questionnaire will be qualitative data and it need to be converted in quantitative data. Using 5 point likert scale table for the conversion.

- (1) - Strongly Disagree
- (2) - Disagree
- (3) - Neutral
- (4) - Agree
- (5) - Strongly Agree

These quantitative data is analyzed using SPSS (Statistical Package for Social Sciences) Where the demographical variable tests, feasibility study for the variables identified, correlation analysis, reliability tests and regression analysis are been carried out.

3.9.1 Descriptive statistical analysis

Descriptive statistical analysis is utilized to depict key highlights of the data in an exploration. Following analysis make the establishment of essentially every form of

analysis information representation like charts, tables and essential statistics like standard deviation and mean.

3.9.2 Pearson correlation coefficient analysis

To analyse the association between two quantitative variables (independent and dependent variable), this correlation coefficient is used. Pearson correlation coefficient investigation has estimated the strength of the nature of the connection between the two components. Positive relationship implies while expanding one variable in positive, the other variable increments positively with a fixed sum. Negative relationship implies while expanding one variable in positive, the other variable abatements negatively with a fixed sum. Every augmentation, there is no positive addition or negative lessening implied by Zero relationship

3.9.3 Regression Test analysis

This is an astoundingly statistical method for setting up connection between factors. It's a strategy to recognize the effect on a minor variable by a set of free factors. Extends that it tends to be used to access the strength of the connection between independent variable and the dependent variable

4 DATA ANALYSIS

4.1 Introduction

This section portrays the data exploration and discoveries of this exploration. Quantitative research studies mostly break down the connection among mathematically assessed aspects with the utilization of measurable applications. Therefore, in the investigation, the survey was utilized to gather facts from the target population and utilize some measurable apparatuses like SPSS programming to examine the information.

To begin with, the specialist has undertaken a descriptive analysis to improve comprehending by working on the range of data. At that point one has done the arithmetical examination to recognize the associations among the chosen factors. correlation coefficient analysis was commenced as the statistical analysis. Subsequently that relapse investigation has been led. At long last, one has done hypothesis approval by utilizing the aftereffect of the above-led analysis.

4.2 Descriptive analysis of Demographic data

Descriptive analysis is misused to portray the principal normal for the information in the exploration study. It conveys a fundamental summary of the example and the actions. Descriptive analysis structure the principal virtual of any quantitative examination of information with basic graphical analysis.

4.2.1 Service time in the software industry

Table 4-1 Service time in the software industry

How long have you been working in the software industry?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	15	7.5	7.5	7.5
	1-3 years	8	4.0	4.0	11.5
	4-5 years	83	41.5	41.5	53.0
	6-10 years	94	47.0	47.0	100.0
	Total	200	100.0	100.0	

Source: Developed by Author, 2021

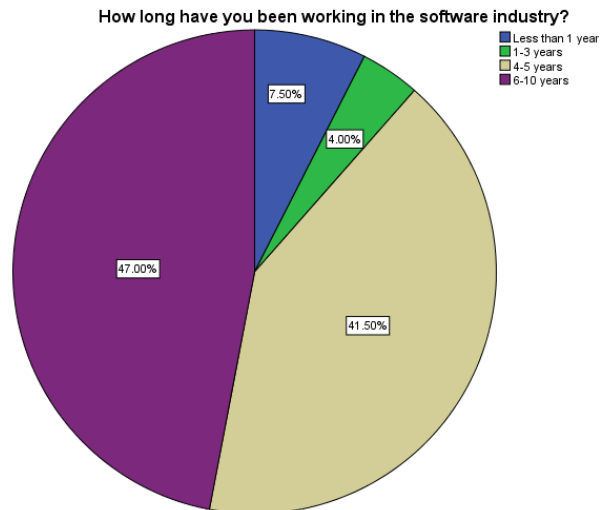


Figure 4-1 Service time in the software industry

Source: Developed by Author, 2021

According to Figure 4-1 and Table 4-1 Service time in the software industry, it is distinguished that the most of the respondents 47% have more than 6 year experience in the software industry. Out of the overall responder count 200, 47% was 6-10 years qualified software professionals and the rest of the 43% was qualified less no of years' experience software professionals.

4.2.2 Current Job Position

Table 4-2 Current Job Position

What is your current job position?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Associate software engineer	130	65.0	65.0	65.0
	Software engineer	16	8.0	8.0	73.0
	Associate tech led	16	8.0	8.0	81.0
	Tech led	8	4.0	4.0	85.0
	Other	30	15.0	15.0	100.0
	Total	200	100.0	100.0	

Source: Developed by Author, 2021

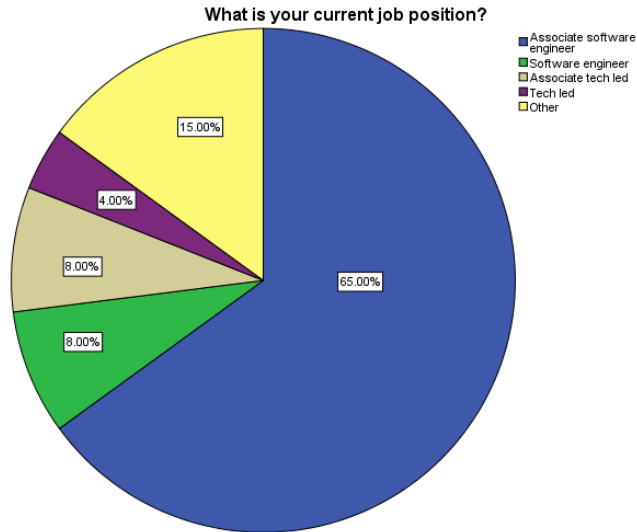


Figure 4-2 Current Job Position

Source: Developed by Author, 2021

According to Figure 4-2 and Table 4-2 Current Job Position, it is distinguished that the most of the respondents are in the position of Associate software engineer which is 65%.

. Out of the overall responder count 200, 65% was Associate software engineers the rest of the 35% was qualified other experience software professionals.

4.2.3 Income Category

Table 4-3: Income Category

Mention the income category				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid LKR 70,000-100,000	62	31.0	31.0	31.0
LKR 100,000-300,000	130	65.0	65.0	96.0
Above 500,000	8	4.0	4.0	100.0
Total	200	100.0	100.0	

Source: Developed by Author, 2021

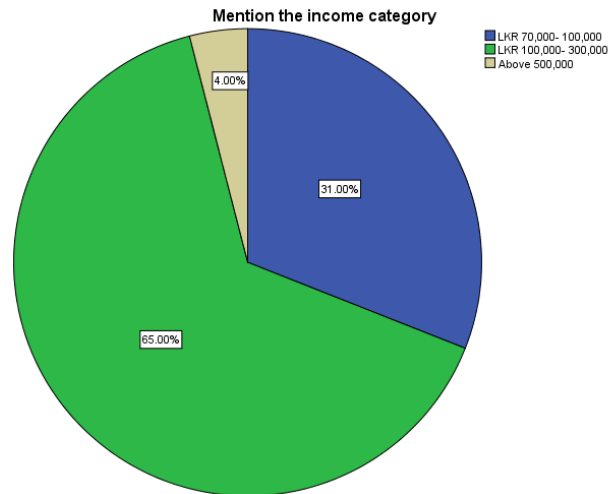


Figure 4-3: Income Category

Source: Developed by Author, 2021

As demonstrated in the above Table 4 -3 65% of the software engineers are having an income level between LKR 100,000- 300,000.

According to Figure 4-3 and Table 4-3 Income Category, it is distinguished that the most of the respondent's software engineers are having an income level between LKR 100,000- 300,000 which is 65%. Rest of the others qualified other income categories in software professionals.

4.2.4 Employment Type

Table 4-4: Employment Type

Employment Type					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Full-time employed	200	100.0	100.0	100.0

Source: Developed by Author, 2021

All of the respondents are full time employees according to the above table 4-4.

4.2.5 Service time in the current organization

Table 4-5: Service time in the current organization

How long have you been working in the current organization ?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	38	19.0	19.0	19.0
	1-3 years	102	51.0	51.0	70.0
	4-6 years	37	18.5	18.5	88.5
	Above 6 years	23	11.5	11.5	100.0
	Total	200	100.0	100.0	

Source: Developed by Author, 2021

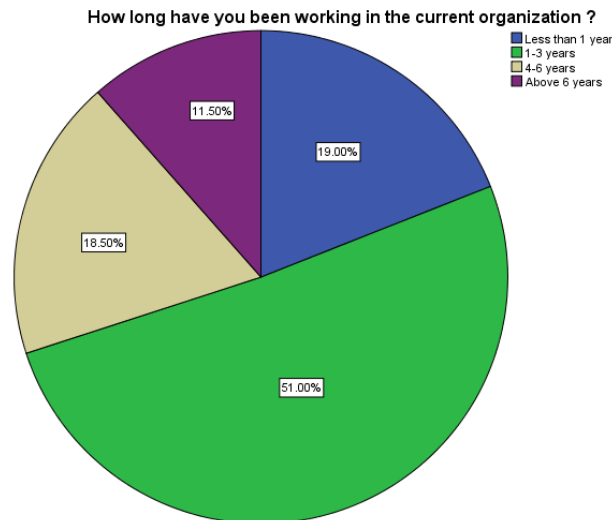


Figure 4-4 Service time in the current organization

Source: Developed by Author, 2021

Table 4-5 demonstrates the service time in the current organization of the respondents. Majority, 51%, of the software engineers are serving 1-3-year service.

According to Figure 4-4 and Table 4-5 Service time in current organization, it is distinguished that the most of the respondents 51% and 11.5% response received for more than 6 years in the same company.

4.2.6 Number of Organizations worked

Table 4-6: Number of Organizations worked

With how many organizations have you worked with ?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-2	176	88.0	88.0	88.0
	2-5	24	12.0	12.0	100.0
Total		200	100.0	100.0	

Source: Developed by Author, 2021

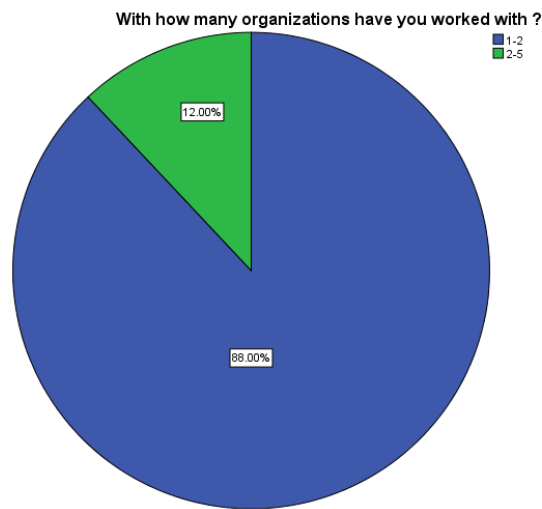


Figure 4-5 Number of Organizations worked

Source: Developed by Author, 2021

As reflected in the table 4-6 above 88% of the respondents have worked with 1 to 2 organizations. The 12% of respondents have 2-5 worked companies

4.2.7 Gender

Table 4-7: Gender

Select your gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	105	52.5	52.5	52.5
	Female	95	47.5	47.5	100.0
	Total	200	100.0	100.0	

Source: Developed by Author, 2021

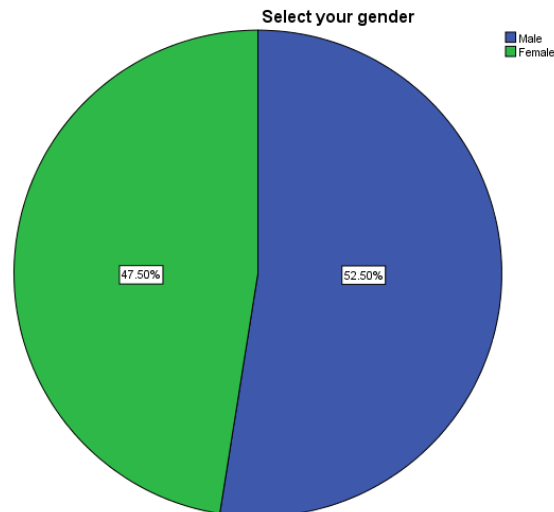


Figure 4-6 Gender

Source: Developed by Author, 2021

According to Figure 4-6 and Table 4-7 Gender Structure, that one distinguished that the furthestmost of the respondents are male. Overall responder counts 200, 52.5% was male capable software professionals and the rest of the 47.5%.

This statistic is somewhat clear to demonstrate that there is an equivalent tally of male and female software experts work in the Sri Lankan IT industry.

4.2.8 Age

Table 4-8: Age

To which age group do you belong to?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-25 years	3	1.5	1.5	1.5
	26-35 years	161	80.5	80.5	82.0
	36-45 years	36	18.0	18.0	100.0
	Total	200	100.0	100.0	

Source: Developed by Author, 2021

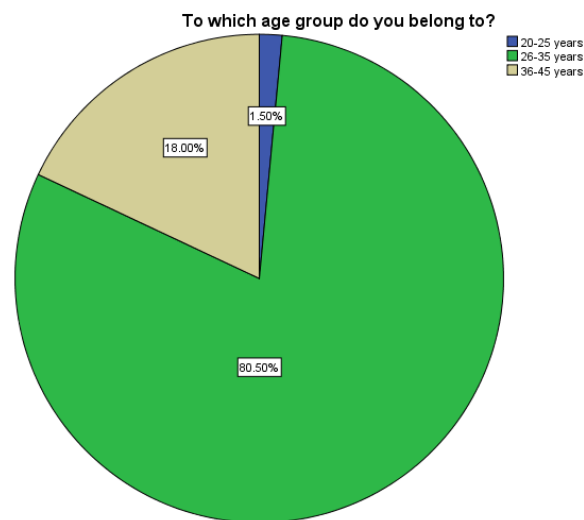


Figure 4-7 Age

Source: Developed by Author, 2021

The above table 4-8 80.5% of the respondents are in the age group of 26-35 years.

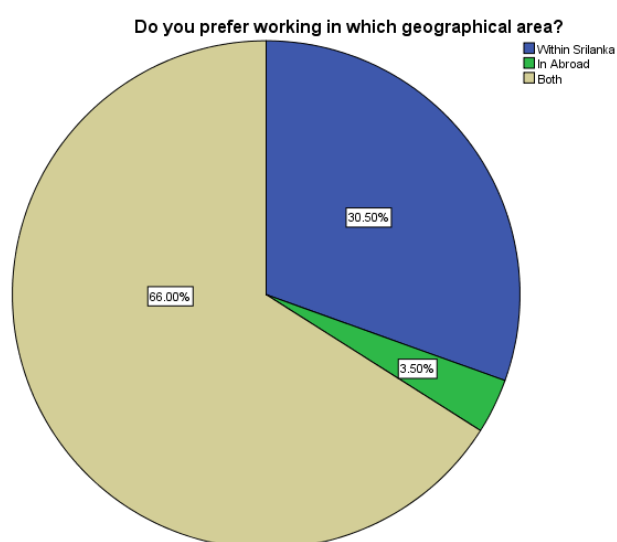
As distinguished in the above Table 4 - 8 80.5% most of the respondents are in the age group of 26-35-year category. Rest of the others qualified other age group categories in software professionals.

4.2.9 Preferred geographical area

Table 4-9: Preferred geographical area

Do you prefer working in which geographical area?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Within Sri Lanka	61	30.5	30.5	30.5
	In Abroad	7	3.5	3.5	34.0
	Both	132	66.0	66.0	100.0
	Total	200	100.0	100.0	

Source: Developed by Author, 2021



Source:
Author, 2021

Developed by

Figure 4-8 Preferred geographical area

Table 4-9 delivers the data for the most preferred geographical area and majority of the respondents which is 66% prefer both Sri Lanka and abroad.

4.2.10 Learning opportunities provided by Employers

Table 4-10 Learning opportunities provided by Employers

Do the current/previous employer/s have provided learning opportunities?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	144	72.0	72.0	72.0
	No	40	20.0	20.0	92.0
	Maybe	16	8.0	8.0	100.0
	Total	200	100.0	100.0	

Source: Developed by Author, 2021

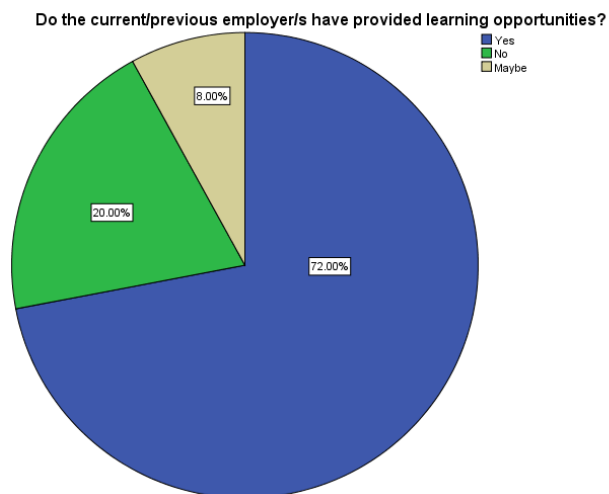


Figure 4-9 Learning opportunities provided by Employers

Source: Developed by Author, 2021

As reflected in the above table 4-10, 72% of the respondents are agreeing that their employers are giving employment opportunities.

4.3 Frequency Analysis

4.3.1 Income Level – Frequency Analysis

Table 4-11 Income Level – Frequency Analysis

Statistics					
	Other countries pay more for software engineers	My educational qualifications helped me to earn a higher salary	My level of experience contributed in earning a higher salary	When the level of skills improve salary increases	My current job on chosen language/framework effect to my income
N Valid	200	200	200	200	200
Missing	0	0	0	0	0
Mean	4.56	3.56	3.86	3.93	3.98
Std. Deviation	.906	1.045	1.068	1.073	.932

Source: Developed by Author, 2021

Table 4-11 demonstrates the frequency analysis for the independent variable of income level. According to the data the statement of “Other countries pay more for software engineers” has the highest mean value of 4.56. The lowest mean value is for the statement of” My educational qualifications helped me to earn a higher salary” and it’s 3.56.

All questions get mean values closer to 4. As these mean values are very close to 4 on a scale of 1 to 5, these mean values represent mostly an agree stance for the questions of income level by the respondents.

Table A-1 to Table A-5 of Appendix A presents the summary of descriptive analysis obtained for the independent variable income level. The respondents stated that “Other countries pay more for software engineers” it is clear that it has mostly, 73.5%

When it was inquired, 42.0% responded agreed “My educational qualifications helped me to earn a higher salary “. 56.5.0% responded as they agreed stated “My level of experience contributed in earning a higher salary”

4.3.2 Availability of Job Opportunities – Frequency Analysis

Table 4-12: Availability of Job Opportunities – Frequency Analysis

Statistics					
	My gender matters in searching for a job	Soft skills improves job opportunities	Educational qualifications improve job opportunities	Economic status impacts the level of job opportunities	My current job on chosen language/framework effect to job opportunities
N Valid	200	200	200	200	200
Missing	0	0	0	0	0
Mean	2.15	4.05	3.95	3.35	4.14
Std. Deviation	.958	.843	.903	1.106	.880

Source: Developed by Author, 2021

Frequency analysis results for the independent variable of availability of job opportunities is demonstrated in the table 4-12 above. It is clear that “My current job on chosen language/framework effect to job opportunities” statement has the highest mean value of 4.14.

All questions get mean values closer to 4. As these mean values are very close to 4 on a scale of 1 to 5, these mean values represent mostly an agree stance for the questions of Availability of Job Opportunities by the respondents. Only for one question (My gender matters in searching for a job) received mean value around 2 means mostly it’s related to disagree state.

Table A-6 to Table A-10 of Appendix A presents the summary of descriptive analysis obtained for the independent variable Availability of Job Opportunities. The

respondents stated that “42.5% of the respondents are disagreed to the statement of “My gender matters in searching for a job”. 57% of the respondents are agreed with the statement of “Soft skills improves job opportunities”. 46.5% of the respondents are agreed with the statement of “Educational qualifications improve job opportunities”

4.3.3 Labour Market Competition – Frequency Analysis

Table 4-13: Labour Market Competition – Frequency Analysis

Statistics					
		Advanced technical knowledge increases the competition	Language/framework specialization in tasks increases the competition	Updated knowledge in innovative technologies impact increases competition	Innovative working behavior is increases competition
N	Valid	200	200	200	200
	Missing	0	0	0	0
Mean		4.02	3.90	3.98	3.98
Std. Deviation		.865	.962	.888	.894

Source: Developed by Author, 2021

According to the above table 4-13 the highest mean value has achieved for “Advanced technical knowledge increases the competition” which is 4.02 under the independent variable of Labour Market Competition.

All questions get mean values closer to 4. As these mean values are very close to 4 on a scale of 1 to 5, these mean values represent mostly an agree stance for the questions of Labour Market Competition by the respondents

Table A-11 to Table A-15 of Appendix A presents the summary of descriptive analysis obtained for the independent variable Labour Market Competition. The respondents stated that “49.0% of the respondents are agreed to the statement of “Advanced technical knowledge increases the competition”. 57.5% of the

respondents are agreed with the statement of “Language/framework specialization in tasks increases the competition”. 49.5% of the respondents are agreed with the statement of “Updated knowledge in innovative technologies impact increases competition”

4.3.4 Extended Learning – Frequency Analysis

Table 4-14: Extended Learning – Frequency Analysis

		Statistics			
		I have to update my knowledge due to technological advances	I have to continue learning since it impacts job quality	Training and development improves my knowledge	Technological changes impacts on continuous learning
N	Valid	200	200	200	200
	Missing	0	0	0	0
Mean		4.29	4.41	4.25	4.25
Std. Deviation		.889	.903	.873	.831

Source: Developed by Author, 2021

Table 4-14 demonstrates the frequency analysis for the independent variable of Extended Learning. According to the data the statement of “I have to continue learning since it impacts job quality” has the highest mean value of 4.41.

All questions get mean values closer to 4. As these mean values are close to 5 on a scale of 1 to 5, these mean values represent mostly a strongly agree stance for the questions of Extended Learning by the respondents

Table A-15 to Table A-18 of Appendix A presents the summary of descriptive analysis obtained for the independent variable Extended Learning. The respondents stated that “47.50% of the respondents are strongly agreed to the statement of “I have to update my knowledge due to technological advances”. 58.5% of the respondents are strongly agreed with the statement of “I have to continue learning since it impacts job quality”. 46.0% of the respondents are agreed with the statement of “Training and development improves my knowledge”

4.3.5 Job Satisfaction – Frequency Analysis

Table 4-15: Job Satisfaction – Frequency Analysis

Statistics						
	I am satisfied with the language/framework I chosen	Job satisfaction not impact to my job security	Level of pay impacts on job satisfaction	Level of stress impacts on job satisfaction	Job security impacts on job satisfaction	Quality of working environment improves job satisfaction
N Valid	200	96	200	200	200	200
Missing	0	104	0	0	0	0
Mean	3.43	2.81	4.35	4.37	4.02	4.01
Std. Deviation	1.073	1.386	.855	.898	.913	.905

Source: Developed by Author, 2021

According to the above table 4-15 the highest mean value has achieved for “Level of stress impacts on job satisfaction” which is 4.37 under the independent variable of Job Satisfaction.

Some of the questions get mean values closer to 4. As these mean values are close to 5 on a scale of 1 to 5, these mean values represent mostly an agree stance for some questions of Job Satisfaction by the respondents. Once one question near to scale 3 that means represent mostly a neutral stance

Table A-19 to Table A-24 of Appendix A presents the summary of descriptive analysis obtained for the independent variable Job Satisfaction. The respondents stated that “65.00% of the respondents are agreed to the statement of “I am satisfied with the language/framework I chosen”. 32.3% of the respondents are agreed with the statement of “Job satisfaction not impact to my job security”. 49.5% of the

respondents are strongly agreed with the statement of “Level of pay impacts on job satisfaction”

4.3.6 Lack of Job Security – Frequency Analysis

Table 4-16: Lack Of Job Security – Frequency Analysis

Statistics						
	Economic downturns increases job insecurity	My age increases job insecurity	My current job on chosen language/framework will increase job insecurity	Social issues increase job insecurity	Negative emotions increase job insecurity	Negative working behavior increases job insecurity
N Valid	200	200	200	200	200	200
Missing	0	0	0	0	0	0
Mean	3.39	3.55	3.48	3.78	3.79	4.29
Std. Deviation	1.173	1.185	1.112	1.117	1.180	.927

Source: Developed by Author, 2021

Table 4-16 demonstrates the frequency analysis for the dependent variable of lack of job security. According to the data the statement of “Negative working behavior increases job insecurity” has the highest mean value of 4.29.

All questions get mean values closer to 4. As these mean values are close to 5 on a scale of 1 to 5, these mean values represent mostly a strongly agree stance for the questions of Job Security

Table A-25 to Table A-30 of Appendix A presents the summary of descriptive analysis obtained for the independent variable Job Security. The respondents stated that “31.00% of the respondents are agreed to the statement of “Economic downturns increases job insecurity”. 46.5% of the respondents are agreed with the statement of “My age increases job insecurity”. 54.5% of the respondents are agreed with the

statement of “My current job on chosen language/framework will increase job insecurity”

4.4 Reliability Test

4.4.1 Income Level – Reliability Test

Table 4-17 Income Level – Reliability Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.885	5

Source: Developed by Author, 2021

Table 4-17 demonstrates the reliability results for the independent variable of Income level. The Cronbach's Alpha value for the variable is 0.885 which is greater than 0.7 and hence it is achieved the reliability of the five items and eligible for further analysis.

4.4.2 Availability of Job Opportunities – Reliability Test

Table 4-18: Availability of Job Opportunities – Reliability Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.738	5

Source: Developed by Author, 2021

Table 4-18 demonstrates the reliability results for the independent variable of Job Opportunities. The Cronbach's Alpha value for the variable is 0.738 which is greater than 0.7 and hence it is achieved the reliability for the five items and eligible for further analysis.

4.4.3 Labour Market Competition – Reliability Test

Table 4-19: Labour Market Competition – Reliability Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.926	4

Source: Developed by Author, 2021

Table 4-19 demonstrates the reliability results for the independent variable of Labour Market Competition. The Cronbach's Alpha value for the variable is 0.926 which is greater than 0.7 and hence it is achieved the reliability for the four items under that and eligible for further analysis.

4.4.4 Extended Learning – Reliability Test

Table 4-20: Extended Learning – Reliability Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.948	4

Source: Developed by Author, 2021

Table 4-20 demonstrates the reliability results for the independent variable of Extended Learning. The Cronbach's Alpha value for the variable is 0.948 which is greater than 0.7 and hence it is achieved the reliability for the four items under that and eligible for further analysis.

4.4.5 Job Satisfaction – Reliability Test

Table 4-21: Job Satisfaction – Reliability Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.862	6

Source: Developed by Author, 2021

Table 4-21 demonstrates the reliability results for the independent variable of Job Satisfaction. The Cronbach's Alpha value for the variable is 0.862 which is greater than 0.7 and hence it is achieved the reliability for the six items under that and eligible for further analysis.

4.4.6 Lack of Job Security – Reliability Test

Table 4-22: Lack of Job Security – Reliability Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.910	6

Source: Developed by Author, 2021

Table 4-22 demonstrates the reliability results for the independent variable of Job Satisfaction. The Cronbach's Alpha value for the variable is 0.910 which is greater than 0.7 and hence it is achieved the reliability for the six items under that and eligible for further analysis.

4.5 Correlation Analysis

Table 4-23: Correlation Analysis

		Correlations					
		Income_Level	Availability_of_Job_Opportunities	Labour_Market_Competition	Extended_Learning	Job_Satisfaction	Lack_of_Job_Security
Income_Level	Pearson Correlation	1	.752**	.607**	.541**	.903**	.728**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	200	200	200	200	96	200
Availability_of_Job_Opportunities	Pearson Correlation	.752**	1	.516**	.678**	.825**	.772**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	200	200	200	200	96	200
Labour_Market_Competition	Pearson Correlation	.607**	.516**	1	.649**	.944**	.532**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	200	200	200	200	96	200
Extended_Learning	Pearson Correlation	.541**	.678**	.649**	1	.818**	.533**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	200	200	200	200	96	200
Job_Satisfaction	Pearson Correlation	.903**	.825**	.944**	.818**	1	.768**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	96	96	96	96	96	96

Lack_of_Job_Security	Pearson Correlation	.728**	.772**	.532**	.533**	.768**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	200	200	200	200	96	200

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Developed by Author, 2021

Table 4-23 demonstrates the correlation analysis for the independent variables of Income level, availability of job opportunities, Extended learning opportunities, Labour market competition and job satisfaction and the dependent variable of lack of job security.

This reflects the association among the independent and dependent variables and in between the independent variables. According to the results the highest positive significant relationship with lack of job security is achieved by the independent variable of job satisfaction where the Pearson correlation value is .768. The lowest Pearson correlation value is .532 which is achieved by labour market competition.

4.6 Multiple Regression Analysis

Table 4-24: Variables Entered/Removed

Variables Entered/Removed ^a			
Model	Variables Entered	Variables Removed	Method
1	Job_Satisfaction, Extended_Learning, Availability_of_Job_Opportunities, Income_Level, Labour_Market_Competition ^b		Enter

a. Dependent Variable: Job_Security

b. All requested variables entered.

Source: Developed by Author, 2021

Table 4-25 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.890 ^a	.792	.780	.454

a. Predictors: (Constant), Job_Satisfaction, Extended_Learning, Availability_of_Job_Opportunities, Income_Level, Labour_Market_Competition

Source: Developed by Author, 2021

According to the model summary it is clear that it has achieved a R square value of .792 and explained 78% variables.

Table 4-26: ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	70.326	5	14.065	68.380	.000 ^b
	Residual	18.512	90	.206		
	Total	88.838	95			

a. Dependent Variable: Lack_of_Job_Security

b. Predictors: (Constant), Job_Satisfaction, Extended_Learning, Availability_of_Job_Opportunities, Income_Level, Labour_Market_Competition

Source: Developed by Author, 2021

As per the ANOVA table the F value is 68.380 which is greater than 1 and hence it can argue that there is significant association in between independent and dependent variables.

Table 4-27: Coefficients

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.143	.219		-.654	.515
Income_Level	.003	.142	.003	.019	.985
Availability_of_Job_Opportunities	1.094	.135	.911	8.130	.000
Labour_Market_Competition	.209	.210	.202	.998	.321
Extended_Learning	-.550	.119	-.597	-4.623	.000
Job_Satisfaction	.349	.176	.312	1.983	.050

a. Dependent Variable: Lack_of_Job_Security

Source: Developed by Author, 2021

As indicated by the model summary it is clear that it has achieved a R square value of .792 and explained 78% variables. Further the table 4-27 demonstrates the regression correlation coefficients of all the five independent variables and it measures the impact of those variables on the dependent variable of lack of job security. According to the regression results it is clear that the independent variables of Income Level, and Labour Market Competition has achieved a significance value of .985 and .321 respectively which is more than 0.05 and hence these variables do not have significant impact on the dependent variable of lack of job security. The highest significant positive impact on the lack of job security is by the independent variable of Availability of Job Opportunities which has a beta value of .911 which is

a strong correlation. Then again, Extended Learning has a significant negative impact on the lack of job security variable which has a beta value of -.597

4.7 Hypothesis Test Summary

Table 4-28 Hypothesis Test Summary

Hypothesis			Accepted/ Rejected	Level of Relationship	Direction
H1	H ₀	There is no impact of income level on software developers lack of job security	Accepted	Weak	Positive
	H _a	There is an impact of income level on software developers lack of job security	Rejected		
H2	H ₀	There is no impact of availability of Job Opportunities on software developers lack of job security	Rejected	Strong	Positive
	H _a	There is an impact of availability of Job Opportunities on software developers lack of job security	Accepted		
H3	H ₀	There is no impact of labour market competition on software developers lack of job security	Accepted	Strong	Positive

	H _a	There is an impact of labour market competition on software developers lack of job security	Rejected		
H4	H ₀	There is no impact of extended learning on software developers lack of job security	Rejected	Strong	Negative
	H _a	There is an impact of extended learning on software developers lack of job security	Accepted		
H5	H ₀	There is no impact of job satisfaction on software developers lack of job security	Rejected	Weak	Positive
	H _a	There is an impact of job satisfaction on software developers lack of job security	Accepted		

4.8 Discussion

This study has been carried out with to analyze the job risk of specialized software engineers in Sri Lanka. Author identified five variables based on the literature findings which are income level, availability of job opportunities, labour market competition, extended learning and job satisfaction. According to the data analysis it is clear that all the variables have achieved the reliability for all the items under each and every variable and hence they are eligible for further discussion. This further proves the reliability of the questionnaire prepared by the author for each and every variable. When referring to the independent variable of Income level it has a significant positive relationship with the lack of Job security. Then again, according to multiple regression analysis results it has no significant impact to the lack of Job security. However according to (Castro-Palaganas, et al., 2017) and (McKenzie, Stillman, & Gibson, 2010) are looking for better job opportunities with higher income where they leave the country as well to find new job opportunities. These findings are contradicting with the findings of this study.

According to the data analysis results Availability of Job Opportunities consumes a significant positive association with the lack of job security (dependent variable.) Then again, it has a significant impact on the lack of job security according to the regression analysis report. This finding is confirmed with the findings of (Dardar, Jusoh, & Rasli, 2012) where it reveals that availability of job opportunities has a positive impact on the employee job turnover and job insecurity.

Further Labour Market Competition has significant positive relationship with the lack of job security as revealed by the correlation analysis results. However, there is no significant influence on the lack of job security according to the multiple regression analysis results. When analyzing the literature findings Giannitsis and Kager (2009) and Boundless (2016) reveal that labour market competition is built by job specialization and new technologies which reduces the lack of job security of the employees. Therefore, it can argue that these findings are in contrary to the findings revealed by this particular study where there is no significant impact form the labour market competition on the lack of job security.

Extended learning has positive significant relationship with the lack of job security according to the correlation analysis results. Then again, according to the regression analysis the variable of extended learning had a negative impact on the dependent variable of lack of job security. However, concurring to (Jehanzeb & Bashir, 2013) extended learning through training and development is positively impacting on lack of job security. Job satisfaction has a positive significant association with the lack of job security according to the findings of (Raziq & Maulabakhsh, 2015) which is in line with this particular study. Then again, the same researcher revealed that there is a positive impact and that finding is contradicting with this study where author found out that there is a negative impact.

5 RECOMMENDATIONS AND CONCLUSION

This study has been carried out with the main intention of identifying the important risk factors which could influence the jobs of specialized software developers in Sri Lanka. The author carried out a comprehensive literature study based on international paper articles, reports and other consistent secondary information sources to find the main impactful factors. According to the literature, it was revealed that the factors of income level, availability of job opportunities, labour market competition, extended learning and job satisfaction could have an influence on the employment security of the specialized fields of software engineers in Sri Lanka. Therefore, the author was able to achieve this primary objective and find the answer for the main question of ‘what are the job risks faced by software developers in Sri Lanka?’ as well.

Further, according to the primary data analysis, the author found that the income level has a positive correlation with lack of job security and no significant influence on the employment security of the specialized software developers in Sri Lanka. This fulfilled the objective set by the author in identifying how the income level has impacted on job risk/job insecurity of specialized software developers in Sri Lanka. Then again, this finding delivered the answer for the analysis question of ‘what is the influence of income level on job risk/job insecurity of specialized software developers in Sri Lanka?’ as well, where there was no impact.

When considering the variable of availability of job opportunities, the author found out that there was significant positive correlation with lack of job security and significant influence on the lack of job security of the specialized fields software employees in Sri Lanka. This has given the answer for the analysis question of ‘what is the impact of availability of job opportunities on job risk/job insecurity of specialized software developers in Sri Lanka?’ Then again, this finding achieved the objective of identifying how the availability of job opportunities has impacted on job risk/job insecurity of specialized software developers in Sri Lanka.

From the analysis of primary data, it was revealed that the labour market competition has significant positive correlation with lack of job security and had no significant impact on the employment security of the specialized software developers in Sri Lanka. This fulfilled the objective set by the author in identifying how the labour market competition has impacted on job risk/job insecurity of specialized software developers in Sri Lanka. Then again, this finding delivered the answer for the analysis question of ‘what is the impact of labour market competition on job risk/job insecurity of specialized software developers in Sri Lanka?’ as well, where there was no impact.

As revealed by the primary data analysis results on the variable of extended learning, the author found out that there was significant positive correlation with lack of job security and significant negative impact on the job security of the specialized software developers in Sri Lanka. This has given the answer for the analysis question on ‘what is the impact of extended learning on job risk/job insecurity of specialized software developers in Sri Lanka?’ On the other hand, this finding achieved the objective of identifying how the extended learning has impacted on job risk/job insecurity of specialized fields software developers in Sri Lanka.

Job satisfaction was the final variable considered by the author to identify any impacts on the lack of job security of specialized software developers in Sri Lanka. From the initially processed information, the author identified that the job satisfaction had a positive significant correlation with the lack of job security and there was a positive impact on the job security of the specialized software developers in Sri Lanka. This achieved the objective of identifying how the job satisfaction has impacted on job risk/job insecurity of specialized software developers in Sri Lanka. On the other hand, this finding delivered the answer for the analysis question on ‘what is the impact of job satisfaction on job risk/job insecurity of Specialized Software developers in Sri Lanka?’ as well.

In conclusion, the job security or the job risk of the specialized software developers in Sri Lanka was impacted by availability of job opportunities,

extended learning and job satisfaction, according to this study.

5.1 Recommendations

According to the results of the data analysis it can be recommended that the software developers should focus on extended learning personally in order to minimize their job risk by improving their competency level in this highly competitive IT industry. Further they can engage in continuous learning in order to improve their skills. This would reduce the job risk of the software developers in Sri Lanka and according to the analysis it would impact on the job satisfaction as well.

In order to provide the employment security of the specialized fields of software engineers in Sri Lanka, based on the research analysis, it was found it is important to focus on availability of job opportunities, extended learning and job satisfaction as a means of enhancing job satisfaction and motivation within the specialized software fields. Following recommendations are made in this regard:

- Develop Employees Skills

Employer can enhance team work, provide honest feedback frequently (managers become better coaches/Mentoring), invest in personal development (toastmasters)

If employees are not recommending their existing job for new member who are willing to join with company, there should be some impact for the particular project future. Following such skill enhancement would minimize the job insecurity in their minds.

- Flexible work arrangements

Flexibility within the organization in terms of working hours would enable the specialized software engineers to manage work life balance and hence the pressure from the family could be reduced. This would facilitate them to reduce the stress level and motivate employees.

- Employers can provide technology-based learning experience

For instance, using web portals such as Udemy, Pluralsight, etc. to help employees continuously update their knowledge. Companies can invest on these valuable learning portals by sponsoring required monthly fees on behalf of their employees. Improved knowledge levels would make them competitive enough for the labour market and hence lack of job security would be minimized.

- Technical talks, forums and sessions

Employees can be encouraged to participate technical talks, forums and sessions. This would be the best avenue for new knowledge updates through peers in the industry which again build a more competitive knowledge person.

- Organize events for employee-engagement

Companies could also organize events for employee-engagement such as technical day on a frequent basis and invite experts in the industry to participate in those sessions. Those experts would transfer their updated knowledge to developers who are working in such companies. This improves the level of knowledge of the employees and build more technical skills which is compatible enough to the changing technological environment and supports their career lives.

- Employee rotation

If there are number of projects in the same company that are being implemented parallelly, team members can be rotated into different projects that has different technology experience, so that developers can gain new experience that have more value rather than having experience from only one technology.

5.2 Limitations of the research

This research study was examining the job security of the specialized software developers in Sri Lanka. However, there are several other industries in Sri Lanka and those areas were not analyzed in this study which is a limitation. According to the findings of this study, the author identified that income level, availability of job opportunities, labour market competition, extended learning and job satisfaction as the main factors that could impact on the job risk or job security of the software developers in Sri Lanka. However, there are several other factors which could impact on the job risk or job security of the software developers in Sri Lanka. The author selected 200 specialized software developers as the sample population for this research. However, this may not represent all the specialist software developers in the country where they could have another viewpoint which was not covered in this study and hence these results could have been different. This is another constraint of this research.

5.3 Recommendations for future research

It is recommended that the future researchers could examine different factors which could impact on the job security or job risk of the software developers in Sri Lanka. Further, it is better if they can select a bigger sample for primary data analysis which could be more reliable. Then again, they can examine other industries in Sri Lankan economy where the work force has job insecurity. Then again, future researches can be done based on exact confirmations obtained through literature, though this investigation was least dependent on both primary and secondary data.

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Appendix A- DESCRIPTIVE STATISTICS

Table A-1 Income level Question 1 - Descriptive Statistics

Other countries pay more for software engineers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	15	7.5	7.5	11.0
	Agree	31	15.5	15.5	26.5
	Strongly Agree	147	73.5	73.5	100.0
	Total	200	100.0	100.0	

According to the descriptive statistics for the statement of “Other countries pay more for software engineers” it is clear that it has mostly, 73.5%, a Strongly agreed stance which has.

Table A-2 Income level Question 2 - Descriptive Statistics

My educational qualifications helped me to earn a higher salary

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	7.5	7.5	7.5
	Disagree	7	3.5	3.5	11.0
	Neutral	62	31.0	31.0	42.0
	Agree	84	42.0	42.0	84.0
	Strongly Agree	32	16.0	16.0	100.0
	Total	200	100.0	100.0	

As displayed in the above table 42% of the respondents are agreed to the statement of “My educational qualifications helped me to earn a higher salary”.

Table A-3 Income level Question 3 - Descriptive Statistics

My level of experience contributed in earning a higher salary					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	7.5	7.5	7.5
	Disagree	8	4.0	4.0	11.5
	Neutral	16	8.0	8.0	19.5
	Agree	113	56.5	56.5	76.0
	Strongly Agree	48	24.0	24.0	100.0
	Total	200	100.0	100.0	

According to the above table 56.5% of the respondents are strongly agreed with the statement of “My level of experience helped me to earn a higher salary”

Table A-4 Income level Question 4 - Descriptive Statistics

When the level of skills improve salary increases					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	7.5	7.5	7.5
	Disagree	8	4.0	4.0	11.5
	Neutral	8	4.0	4.0	15.5
	Agree	114	57.0	57.0	72.5
	Strongly Agree	55	27.5	27.5	100.0
	Total	200	100.0	100.0	

As displayed in the above table 57% of the respondents are agreed to the statement of “When the level of skills improve salary increases”.

Table A-5 Income level Question 5 - Descriptive Statistics

My current job on chosen language/framework effect to my income					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	47	23.5	23.5	27.0
	Agree	83	41.5	41.5	68.5
	Strongly Agree	63	31.5	31.5	100.0

Total	200	100.0	100.0
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According to the descriptive statistics for the statement of “My current job on chosen language/framework effect to my income” it is clear that it has mostly, 41.5%, an agreed stance.

Table A-6 Availability of Job Opportunities Question 1 - Descriptive Statistics

My gender matters in searching for a job					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	55	27.5	27.5	27.5
	Disagree	85	42.5	42.5	70.0
	Neutral	36	18.0	18.0	88.0
	Agree	24	12.0	12.0	100.0
	Total	200	100.0	100.0	

As displayed in the above table 42.5% of the respondents are disagreed to the statement of “My gender matters in searching for a job”

Table A-7 Availability of Job Opportunities Question 2 - Descriptive Statistics

Soft skills improves job opportunities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	24	12.0	12.0	15.5
	Agree	114	57.0	57.0	72.5
	Strongly Agree	55	27.5	27.5	100.0
	Total	200	100.0	100.0	

As per the table above 57% of the respondents are agreed with the statement of “Soft skills improves job opportunities”

Table A-8 Availability of Job Opportunities Question 3 - Descriptive Statistics

Educational qualifications improve job opportunities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	45	22.5	22.5	26.0
	Agree	93	46.5	46.5	72.5
	Strongly Agree	55	27.5	27.5	100.0
	Total	200	100.0	100.0	

According to the above table 46.5% of the respondents are agreed with the statement of “Educational qualifications improve job opportunities”

Table A-9 Availability of Job Opportunities Question 4 - Descriptive Statistics

Economic status impacts the level of job opportunities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Disagree	47	23.5	23.5	27.0
	Neutral	46	23.0	23.0	50.0
	Agree	69	34.5	34.5	84.5
	Strongly Agree	31	15.5	15.5	100.0
	Total	200	100.0	100.0	

As displayed in the above table 34.5% of the respondents are disagreed to the statement of “Economic status impacts the level of job opportunities”

Table A-10 Availability of Job Opportunities Question 5 - Descriptive Statistics

My current job on chosen language/framework effect to job opportunities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	23	11.5	11.5	15.0
	Agree	98	49.0	49.0	64.0
	Strongly Agree	72	36.0	36.0	100.0
	Total	200	100.0	100.0	

According to the above table “My current job on chosen language/framework effect to job opportunities” statement has obtained 49% of agreed stance.

Table A-11 Labour Market Competition Question 1- Descriptive Statistics

Advanced technical knowledge increases the competition					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	31	15.5	15.5	19.0
	Agree	107	53.5	53.5	72.5
	Strongly Agree	55	27.5	27.5	100.0
	Total	200	100.0	100.0	

It is evident that 53.5% of the respondents are agreed with the statement of “Advanced technical knowledge increases the competition” according to the above table.

Table A-12 Labour Market Competition Question 2- Descriptive Statistics

Language/framework specialization in tasks increases the competition					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Disagree	15	7.5	7.5	11.0
	Neutral	16	8.0	8.0	19.0
	Agree	115	57.5	57.5	76.5
	Strongly Agree	47	23.5	23.5	100.0
	Total	200	100.0	100.0	

According to the above table “Language/framework specialization in tasks increases the competition” statement has obtained 57.5% of agreed stance.

Table A-13 Labour Market Competition Question 3- Descriptive Statistics

Updated knowledge in innovative technologies impact increases competition					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	39	19.5	19.5	23.0
	Agree	99	49.5	49.5	72.5
	Strongly Agree	55	27.5	27.5	100.0
	Total	200	100.0	100.0	

It is evident that 49.5% of the respondents are agreed with the statement of “Updated knowledge in innovative technologies impact increases competition” according to the above table.

Table A-14 Labour Market Competition Question 4- Descriptive Statistics

Innovative working behavior is increases competition					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Disagree	8	4.0	4.0	7.5
	Neutral	16	8.0	8.0	15.5
	Agree	121	60.5	60.5	76.0
	Strongly Agree	48	24.0	24.0	100.0
	Total	200	100.0	100.0	

According to the above table “Innovative working behavior is increases competition” statement has obtained 60.5% of agreed stance.

Table A-15 Extended Learning Question 1- Descriptive Statistics

I have to update my knowledge due to technological advances					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	16	8.0	8.0	11.5
	Agree	82	41.0	41.0	52.5

Strongly Agree	95	47.5	47.5	100.0
Total	200	100.0	100.0	

According to the above table “I have to update my knowledge due to technological advances” statement has obtained 47.5% of Strongly agreed stance.

Table A-16 Extended Learning Question 2- Descriptive Statistics

I have to continue learning since it impacts job quality					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	15	7.5	7.5	11.0
	Agree	61	30.5	30.5	41.5
	Strongly Agree	117	58.5	58.5	100.0
	Total	200	100.0	100.0	

According to the above table “I have to continue learning since it impacts job quality” statement has obtained 58.5% of Strongly agreed stance.

Table A-17 Extended Learning Question 3- Descriptive Statistics

Training and development improves my knowledge					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	15	7.5	7.5	11.0
	Agree	92	46.0	46.0	57.0
	Strongly Agree	86	43.0	43.0	100.0
	Total	200	100.0	100.0	

According to the above table “Training and development improves my knowledge” statement has obtained 46% of agreed stance.

Table A-18 Extended Learning Question 4- Descriptive Statistics

Technological changes impacts on continuous learning					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	8	4.0	4.0	7.5
	Agree	106	53.0	53.0	60.5
	Strongly Agree	79	39.5	39.5	100.0
	Total	200	100.0	100.0	

According to the above table “Technological changes impacts on continuous learning” statement has obtained 53% of agreed stance.

Table A-19 Job Satisfaction Question 1- Descriptive Statistics

I am satisfied with the language/framework I chosen					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	22	11.0	11.0	11.0
	Disagree	16	8.0	8.0	19.0
	Neutral	24	12.0	12.0	31.0
	Agree	130	65.0	65.0	96.0
	Strongly Agree	8	4.0	4.0	100.0
	Total	200	100.0	100.0	

According to the above table “I am satisfied with the language/framework I chosen” statement has obtained 65% of agreed stance.

Table A-20 Job Satisfaction Question 2- Descriptive Statistics

Job satisfaction not impact to my job security					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	29	14.5	30.2	30.2
	Disagree	7	3.5	7.3	37.5
	Neutral	21	10.5	21.9	59.4
	Agree	31	15.5	32.3	91.7

	Strongly Agree	8	4.0	8.3	100.0
	Total	96	48.0	100.0	
Missing	System	104	52.0		
Total		200	100.0		

As showed in the above table 15.5% of the respondents are agreed to the statement of “Job satisfaction not impact to my job security”.

Table A-21 Job Satisfaction Question 3- Descriptive Statistics

Level of pay impacts on job satisfaction					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	8	4.0	4.0	7.5
	Agree	86	43.0	43.0	50.5
	Strongly Agree	99	49.5	49.5	100.0
	Total	200	100.0	100.0	

As displayed in the above table respondents are strongly agreed the to the statement of “Level of pay impacts on job satisfaction”. It’s 49.5%

Table A-22 Job Satisfaction Question 4- Descriptive Statistics

Level of stress impacts on job satisfaction					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	15	7.5	7.5	11.0
	Agree	69	34.5	34.5	45.5
	Strongly Agree	109	54.5	54.5	100.0
	Total	200	100.0	100.0	

As displayed in the above table 54.5% of the respondents are strongly agreed to the statement of “Level of stress impacts on job satisfaction”.

Table A-23 Job Satisfaction Question 5- Descriptive Statistics

Job security impacts on job satisfaction

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	7	3.5	3.5	3.5
Neutral	39	19.5	19.5	23.0
Agree	90	45.0	45.0	68.0
Strongly Agree	64	32.0	32.0	100.0
Total	200	100.0	100.0	

As displayed in the above table 45% of the respondents are agreed to the statement of “Job security impacts on job satisfaction”.

Table A-24 Job Satisfaction Question 6- Descriptive Statistics

Quality of working environment improves job satisfaction

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	7	3.5	3.5	3.5
Neutral	39	19.5	19.5	23.0
Agree	93	46.5	46.5	69.5
Strongly Agree	61	30.5	30.5	100.0
Total	200	100.0	100.0	

As presented in the above table 46.5% of the respondents are agreed to the statement of “Quality of working environment improves job satisfaction”.

Table A-25 Lack of Job Security Question 1- Descriptive Statistics

Economic downturns increases job insecurity					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	7.5	7.5	7.5
	Disagree	30	15.0	15.0	22.5
	Neutral	55	27.5	27.5	50.0
	Agree	62	31.0	31.0	81.0
	Strongly Agree	38	19.0	19.0	100.0
	Total	200	100.0	100.0	

As displayed in the above table 31% of the respondents are strongly agreed to the statement of “Economic downturns increases job insecurity”.

Table A-26 Lack of Job Security Question 2- Descriptive Statistics

My age increases job insecurity					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	7.5	7.5	7.5
	Disagree	31	15.5	15.5	23.0
	Neutral	22	11.0	11.0	34.0
	Agree	93	46.5	46.5	80.5
	Strongly Agree	39	19.5	19.5	100.0
	Total	200	100.0	100.0	

As displayed in the above table 46.5% of the respondents are agreed to the statement of “My age increases job insecurity”.

Table A-27 Lack of Job Security Question 3- Descriptive Statistics

My current job on chosen language/framework will increases job insecurity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	7.5	7.5	7.5
	Disagree	30	15.0	15.0	22.5
	Neutral	23	11.5	11.5	34.0
	Agree	109	54.5	54.5	88.5
	Strongly Agree	23	11.5	11.5	100.0
	Total	200	100.0	100.0	

As displayed in the above table 54.5% of the respondents are agreed to the statement of “My current job on chosen language/framework will increase job insecurity”.

Table A-28 Lack of Job Security Question 4- Descriptive Statistics

Social issues increases job insecurity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	7.5	7.5	7.5
	Disagree	8	4.0	4.0	11.5
	Neutral	37	18.5	18.5	30.0
	Agree	86	43.0	43.0	73.0
	Strongly Agree	54	27.0	27.0	100.0
	Total	200	100.0	100.0	

As displayed in the above table 43% of the respondents are agreed to the statement of “Social issues increases job insecurity”.

Table A-29 Lack of Job Security Question 4- Descriptive Statistics

Negative emotions increases job insecurity					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	7.5	7.5	7.5
	Disagree	22	11.0	11.0	18.5
	Neutral	8	4.0	4.0	22.5
	Agree	100	50.0	50.0	72.5
	Strongly Agree	55	27.5	27.5	100.0
	Total	200	100.0	100.0	

As displayed in the above table 50% of the respondents are agreed to the declaration of “Negative emotions increases job insecurity”.

Table A-30 Lack of Job Security Question 5- Descriptive Statistics

Negative working behavior increases job insecurity					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.5	3.5	3.5
	Neutral	23	11.5	11.5	15.0
	Agree	68	34.0	34.0	49.0
	Strongly Agree	102	51.0	51.0	100.0
	Total	200	100.0	100.0	

As displayed in the above table 51% of the respondents are strongly agreed to the statement of “Negative working behavior increases job insecurity”.

Appendix B - QUESTIONNAIRE INSTRUMENT

		I	II	III	IV	V
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	<u>Income Level</u>					
01	Other countries pay more for software engineers					
02	My educational qualifications helped me to earn a higher salary					
03	My level of experience contributed in earning a higher salary					
04	When the level of skills improve salary increases					
05	My current job on chosen language/framework effect to my income					
	<u>Availability of Job Opportunities</u>					
05	My gender matters in searching for a job					
06	Soft skills improves job opportunities					
07	Educational qualifications improve job opportunities					
08	Economic status impacts the level of job opportunities					
09	My current job on chosen language/framework effect to job opportunities					
	<u>Labour Market Competition</u>					
10	Advanced technical knowledge increases the competition					
11	Specialization in tasks increases the competition					

12	Updated knowledge in innovative technologies impact increases competition					
13	Innovative working behavior is increases competition					
	<u>Extended Learning</u>					
14	I have to update my knowledge due to technological advances					
15	I have to continue learning since it impacts job quality					
16	Training and development improves my knowledge					
17	Technological changes impacts on continuous learning					
	<u>Job Satisfaction</u>					
18	I am satisfied with the career I chosen					
19	Job satisfaction not impact to my job security					
20	Quality of working environment improves job satisfaction					
21	Level of pay impacts on job satisfaction					
22	Level of stress impacts on job satisfaction					
23	Job security impacts on job satisfaction					
	<u>Lack of Job Security</u>					
24	Economic downturns increases job insecurity					
25	Social issues increases job insecurity					
26	My age increases job insecurity					
27	Negative emotions increases job insecurity					
28	My current job on chosen language/framework will					

	increases job insecurity					
29	Negative working behavior increases job insecurity					

	Less than 1 year		1-3 years	4-5 years	6-10 years	Above 10 years
How long have you been working in the software industry?						
	Associate software engineer	Software engineer	Senior software engineer	Associate tech led	Tech led	Senior tech led
What is your current job position						
	LKR 70,000-100,000	LKR 100,000-300,000	LKR 300,000-500,000	Above 500,000		
Mention the income category						

	Full-time employed	Part-time employed	Not in paid employment	Student and working
Are you ?				
	Less than 1 year	1-3 years	4-6 years	Above 6 years
How long have you been working in the current organization ?				
	1-2 years	2-5 years	More than 5 years	
With how many organizations have you worked with ?				
	Male		Female	
Select your gender				

	Yes	No			Maybe	
Do the current/previous employer/s have provided learning opportunities						
	20-25	26-35	36-45	46-55	Above 55	
To which age group do you belong to?						

	Within Srilanka	In Abroad		Both
Do you prefer working in which geographical area?				

Appendix C - PILOT SURVEY QUESTIONNAIRE

		Yes	No	Maybe
01	There is high demand on my current job on chosen language/framework			
02	My job security depends on my current job on chosen language/framework			
03	High diversity rate for similar job on my chosen language/framework			
04	My education directly effect to my job security			
05	My professional skills directly effects to my job security			
06	My income level is directly effects to my job security			
07	My current job on chosen language/framework related job opportunities directly effect to my job security			
08	Labour market competition directly effect to my job security			
09	Organizational changes directly effect to my job security			
10	Do you think person's age will affect for their new learning and technical adaptability			
11	Do you think the current job on chosen language/framework an obstacle when you change your current occupation			
12	Do you think extend learning will effect to mitigate the job insecurity			
13	Do you believe that acquiring more knowledge will ensure your job safety			

	Less than 1 year	1-3 years	4-5 years	6-10 years	Above 10 years
How long have you been working in the software industry?					
	20-25	26-35	36-45	46-55	Above 55
To which age group do you belong to?					
	Male		Female		
Select your gender					
	Highly satisfied	Satisfied	Neural	Dissatisfied	Highly dissatisfied
Rate your job satisfaction from below					
	Yes		No		
Do you have any alternative career path other than the specialized areas in case of job turnover?					
	Yes		No		
Did you use your current job on chosen language/framework previously?					
	1-5	5-10	More than 10		

Roughly how many companies use your current employer's language/framework within Sri Lanka?			
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