IDENTIFICATION OF BUSINESS DISCOURAGEMENTS ON FREELANCE IT IN SRI LANKA: STATISTICAL APPROACH

Roshana Thamareendra Seneviratne

(138852E)

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Department of Mathematics
Faculty of Engineering
University of Moratuwa
Sri Lanka

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The above candidate has carried out research for the Masters Dissertation under my supervision.

…….. ……

Dr. Prasad Jayaweera Date:
Senior Lecturer in Computer & System Sciences
Supervisor
Department of Computer Science
Faculty of Applied Sciences
University of Sri Jayewardenepura
Sri Lanka

…….. ……

Prof. T.S.G Peiris Date:
Professor in Applied Statistics
Co-supervisor
Department of Mathematics
Faculty of Engineering
University of Moratuwa
Sri Lanka

ABSTRACT

Sri Lankan government is allocating a large budget annually to develop multi-skilled Information Technology professionals, but when it comes to the IT freelancers, it was with enough evidence that IT industry is not receiving full benefit from them. Many Sri Lankans are listed in the freelance market sites but only a fraction of them are actually working. This study was carried out to identify the obstacles behind the freelancing community and to recommend the steps to be taken to improve freelancing as a prestigious profession. This study is executed from the freelancer's point of view and considered most of the freelancing activities done online. A sample of 300 was selected and the sampling method is simple random sampling. Factor Analysis was used to analyze the data collected through a structured questionnaire. Factors were extracted using Principal Component Analysis method and rotated using Varimax method. Results found that 3-factor model is suitable to explain association among 14 variables. The identified three factors are "Freelance Market Restraints", "Professional Restraints" and "Social and Personal Restraints". Freelance Market Restraints increase with increasing scores for lack of individual competencies, round the clock coverage, nonpayment risk, solitude, no form of strategic planning, lot of legwork and variable income. Professional Restraints increase with increasing scores for health hazards, no employer benefits, contradictory feedback and lack of social recognition. Social and Personal Restraints increase with increasing scores for difficult to allocate work time, misbeliefs and no assistance. The results indicated that policymakers should pay attention to areas such as nonpayment risk, lack of social recognition, lack of opportunity to grow and poor working conditions to make them productive for the country. Increase commitment, develop problem-solving skills, use social media and reward loyal customers are the factors to be considered by the freelancers for long term presence.

Keywords: Constraints, Factor Analysis, Freelancing, Information Technology, Sri Lanka, Varimax rotation

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LIST OF ABBREVIATIONS

Abbreviation	Description
EFA	Exploratory Factor Analysis
FA	Factor Analysis
G.C.E	General Certificate of Education
IT	Information Technology
KMO	Kaiser-Meyer-Olkin Measure
PAF	Principal Axis Factoring
PCA	Principal Component Analysis

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CHAPTER 1
INTRODUCTION

1.1 Background of the Study

A freelance economy relies on hiring self-employed professionals to offer short-term projects in return for an agreed upon wage. Freelance projects are high-priced to appoint a full-time employee or expensive to subcontract. Freelancers are the persons who make themselves prepared to be utilized for such short-term tasks. They can find short-term tasks through classified ads, online, or through temporary staffing agencies (Hayes, 2015). Freelancer only needs a computer, internet connection and a bank account to receive payments. Horton (2010) proposed a definition of online labor markets that outcome of an operation is transferred "over a wire" and the allocation of labor and earning is decided by a group of customers and freelancers performing within a price system. Many individuals & research organizations conducted researches in freelancing (e.g., Internal Revenue Service, 2015; Mackey, 2014). According to them, freelance workers are an important but hidden, part of the small business population. The term 'freelance' is not a legal concept but, commonly used to represent distinctive specialists in the particular activity. Freelance workers are present in all industries (Vessey, 2012).

1.2 Freelance Economy in the World Context

Making money online may seem unclear at first but it is not. Findings of the surveys done by Sukman (2015) indicate that the vast majority of freelancers are less than 40 years (85%) and nearly half of their clients (43%) are based in America. Almost one-quarter of clients (24%) reside in multiple countries within Europe. Half of the freelancers charge under $10 an hour for their work whereas 40% charge between $11 and $30, and 18% demand over $30 per hour. Clients are more interested in their skills, expertise and ratings than their level of education. Professionals working as independent freelancers charge 5% less than those who work attached to a company. Over 80% of the professional's work on one to three jobs at a time and work an average of 36 hours per week (7.2 hours per day for a 5-day work week). Freelancers

from Kenya have the highest average number of working hours per week (42.6) while Egypt comes in second place (38.5). Sri Lankans work 35.1 hours per week whereas Indians work for 37.1 hours per week. Asia, Latin America and Europe are the developing markets. 46% of the freelancers are not happy with their current benefits from freelancing and they prefer to operate for additional time or to impose higher rates. Freelancing will be successful if the freelancers are determined, focused, hold any of a broad diversity of commercial abilities, avoid the scams, maintain a proper work-life balance and use proper techniques.

1.3 Status of Sri Lankan Freelance Economy

Advancements of freelance economy are a key to prosperity. The present freelancing community in Sri Lanka is enlarging in size continuously as a result of the continuous improvements after the conflict era. Freelance market place profit depends on supporting projects to conclude successfully to assure consumers of services remain practicing the marketplace. Since the influencing factors in Sri Lankan context has not been widely investigated, most of them make decision to move to freelancing but have not gained progress as they expected.

To recognize the factors that influence for discouragement in freelancing, it is extremely necessary to consider the individual characteristics and their primary requirements. Freelancers look for improvements in their life: explore different skills, excellent working atmosphere, and an attractive salary. Factors such as salaries, company bonuses, job security and job comfort play a vital role in discouragement of freelance.

The following reasons can be considered as negatively influence freelancer's long-term presence in the marketplace.

i. Most of the Sri Lankan freelancers are unemployed school leavers or undergraduates who typically leave freelancing within two years to accept a good job. They use freelance market as a stepping stone until they gain some experience in their field. As clients do not issue high priced projects to these less experienced categories, they only receive tasks like basic web developments, data entry jobs and online marketing using social networks.

An individual may prefer to move from freelancing to accept a full-time job because he or she might be getting a greater remuneration.

ii. Freelancers that committed to devote time but have no adequate capital to contribute. Software licensing is a tremendous expense. Most of them make less than they did as a full-time employee. Due to inadequate finance freelancers retire from the freelance profession after a short period.

iii. Married freelancers leave freelancing within one year as it is more important to attend family matters than to get involved in freelancing. Freelancers should be self-motivated individuals who are capable of handling a high level of responsibility.

iv. If a person is not a good time-manager, not a good finance- manager nor a person with self–discipline will feel insecure as a freelancer. Such freelancers will retreat from the freelance profession after a short time.

v. Diversity is the best kind of security. If freelancers do not upgrade their skill set, they will be isolated in freelance market and subsequently have to leave from the market.

vi. In Sri Lanka freelancing is discouraged by social recognition and attitudes. People believe that resigning from a stable job and jump directly toward freelancing is a significant mistake.

vii. Overseas projects increase the risk as clients are pushing on freelancers to deliver quality services on time for fewer rates than Indian & Chinese professionals. The language barrier makes valuing and negotiating prices to be the most complex part of freelancing. This will discourage freelancers to continue freelancing within one year and freelancers always loose creativity and confidence from client testimonials and recommendations. Freelancers are under stress as they receive contradictory feedback since the first project not being performed skillfully. Due to this pressure, freelancers retire from the freelance profession after few months.

Studies have been reported the problems related of freelancers by authors in different countries (e.g., Gandia, 2012; Rookard, 2015; Alvi, 2016). However, no studies related to discouragements on freelance business have been reported in Sri Lanka.

Thus it is necessary to find out the most influencing constraints on freelance in Sri Lanka and how to keep freelancers in the freelance marketplace by improving their level of comfort towards freelance marketplaces.

1.4 Objectives of the Study

In view of the above, the objectives of the present study are:

- To identify the deep rooted obstacles behind the freelancing community in Sri Lanka.
- To recommend the steps to be taken to improve freelancing as a prestigious profession in Sri Lanka.

1.5 Significance of the Study

Sri Lankan government is allocating a large budget annually to develop multi skilled Information Technology professionals. Many Sri Lankans are listed in the freelance marketplaces but only a fraction of them are actually working. The current study will be able to provide information to see which indicators require urgent attention.

1.6 Limitations of the Study

It is difficult to find contact information of freelancers since freelance marketplaces do not advertise the freelancer's or project owner's contact information. The study was done using LinkedIn profile contacts and personal contacts. The research was limited to an analysis from the point of view of the freelancers.

1.7 Outline of the Research

The rest of the chapters in this dissertation are organized as follows. Chapter 2 presents a literature review on freelancing. Chapter 3 provides the research methodology. Chapter 4 indicates the preliminary analysis and identified factors are brought forward in Chapter 5. Chapter 6 presents the conclusions, recommendations and suggestions.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

Past studies carried out on identification of obstacles behind the freelancing is studied here. Further, the concept of freelancing approaches and related terms are described.

2.2 Definitions

2.2.1 The freelancer

According to the Merriam-Webster dictionary, freelancer is a self-employed individual who acts independently without being affiliated with or authorized by an organization. Such workers who provide information technology services are considered as freelancers in this study (Merriam-Webster, n.d.).

2.2.2 Types of freelancers

Freelancers are categorized as independent contractors, moonlighters, diversified workers, temporary workers and freelance business owners (Gavizon, 2014).

i. **Independent contractors**: These professionals are identified as the specialists in their field. They do full-time freelancing work. They operate with different personalities and work very carefully as they understand that their succeeding projects depend on the performance of their current project.
ii. **Moonlighters**: These individuals do freelancing after their traditional job and work on a project-based work at night. Their income is steady.
iii. **Diversified workers**: Diversified workers do one or more full-time and part-time jobs throughout the day using various technology paths. Multiple sources of income are the advantage.
iv. **Temporary workers**: These freelancers are designated for a short period but full-time employment for a particular company.

v. **Freelance business owners:** A freelancer who owns a company hires at least 5 freelancers, belongs to this category. These freelancers are established and that cannot hold up with the demand on their services.

Freelance work represents an attractive alternative to a traditional job (Kane, n.d.). Below explains the concept and evolution of freelance work.

2.3 Full Service Freelance Marketplace

Today there are plenty of dedicated websites called full-service online marketplaces where freelancers can contribute their services. Clients provide projects for which experts can bid. Not only individuals and small enterprises but also large organizations use these websites to outsource their abilities (Barsukova & Markin, 2012). The full-service marketplaces charge higher rates and produce tremendous income than the traditional "pass-through" model of "contract medium" marketplaces (Mackey, 2014).

In this study, the freelance marketplace refers as a digital platform that combines customers and merchants of talent and skill on a temporary basis. Industries that need skill are on one side of the market and freelancers that are offering their "talents as a service or full service" on the other hand. Since work is being transacted online, typically between strangers, trust and confidence in the person on the other end of the transaction are critical to a marketplace's credibility. Marketplace structure is meant to provide such trust, confidence, and brand loyalty (Mackey, 2014). There are several websites accessible in the freelance marketplace that offers jobs like Visual.ly, Toptal, 10EQS, Freelancer and Contractiq (Thabassum, 2013). The connection between the clients and the freelancers are shown in Fig.2.1.

Fig.2.1 - Full-Service Freelance Marketplace Process

Source: Mackey (2014)

Full-service freelance marketplaces (Figure 2.1) direct and project supervise projects by screening talented freelancers. Clients engage projects with the full-service organization. The common groups of jobs are web development, programming, writing, translation, design, and multimedia (Thabassum, 2013). Freelancers include a brief of the services that they offer in their profiles. Freelancer profiles are a compilation of personal information, education history, work experience, skills assessments, work samples, and work references and ratings. Basically, it is a digital resume with a focus on activity within that particular marketplace, intended to give businesses all relevant information to make adequate hiring decisions (Mackey, 2014).

The full-service organization will then select the most appropriate freelancers within company database to the project. Freelancers pay periodically enrollment fees and royalty fee based on what type of membership they purchase. Freelancers and clients cooperate with through the software managed by the project manager of the full-service company ensures the progress achieved by the freelancer and the client get immediate updates. The full-service marketplace will invoice the customer after the solution has been accepted by the client. Finally, freelancers will invoice the full-service marketplace (Mackey, 2014).

Freelancers and clients are given feedback questionnaires at the completion of the task, to interact measure achievement with confidence. These star ratings are noticeable to other registered members of the freelance market site (Thabassum, 2013). The structures of these reviews are pretty basic – usually a one to five-star

rating with comments. Reviews are meant to consider reliability, punctuality, professionalism, and quality. Many marketplaces tie their reputation management system into some mechanism by which highly rated freelancers rise to the top of search results or get promoted as "top freelancers". Business profiles are more utilitarian, intended to do things such as Input project requirements, accept applications, assess candidates, award work, manage freelancers, complete transactions, and pay freelancers (Mackey, 2014).

2.4 Freelance Marketplace Evolution

A Large portion of professional publications, blogs, and tutorials can be found on freelancing also refer as outsourcing, e-laboring, work brokering, e-lancing, online servicing, paid crowdsourcing and online laboring. An e-marketplace, or electronic market, is “an online marketplace where buyers and sellers meet to exchange goods, services, money, or information” (Turban, *et al.*, 2007). According to Jenster and Pedersen (2000), it is usually defined as the transfer of duties previously done in-house to outsiders.

The freelance marketplace was classified in four categories based on the following criteria (Federal Ministry of Communication Technology, 2013):

i. **Microwork**: Microwork is a process of dividing large projects into simple tasks through an automated process, then outsource to less experienced freelancers for low rate. Microwork could be altering an article to a different format.
ii. **Macro-task**: Smaller projects than the Microwork but special IT knowledge is expected. Testing a computer program is a macro task.
iii. **Simple task**: A task like designing a website that requires a moderate budget, regular cooperation between the client and medium to high skilled freelancer.
iv. **Complex task**: A project like developing a software that requires a high budget, regular cooperation between the client and an experienced freelancer.

In the history of IT freelancing, Lu (2011) have identified numerous stages and some significant relationships. She shows that IT tasks could efficiently be outsourced than

other operations in an organization. She classifies these trends as "Waves of freelancing".

2.4.1 First wave of freelancing

Electronic Data Systems outsourced with Blue Cross of Pennsylvania for the administration of its entire data processing in 1963. This was the first time a large company had adapted IT outsourcing (Vagelatos, *et al.*, 2010; Lu, 2011). Companies like IBM, Kodak and General Dynamics followed outsourcing. These identified as the highly expensive deals among big organizations (Dibbern, *et al.,* 2004; Lu, 2011).

2.4.2 Second wave of freelancing

Due to lack of professionals to overcome the year 2000 problem, companies began to work with overseas. Companies like American Express and GE Capital International Services began offshore sourcing of back-office operations due to the reduced labor cost. This influenced of offshoring on countries like India and China (Davis, *et al*., 2006; Lu, 2011).

2.5 Factors Encouraging Freelancing

There are many factors that encourage freelancing (Kane, n.d.). These factors are:

- **Flexibility**: Freelancers have the ability to be far more independent than permanent employees. They have the opportunity of organizing their work to accommodate usual productive hours and to make valuable connections. Also they have the opportunity to develop their career at any given time in a way that suits their personal circumstances.
- **Self-government**: Freelancers are self-governors and they usually answer to only their customers. They can reject non-productive, high maintenance, slow-paying and undesirable projects.
- **Cost effectiveness:** Freelancers have the benefit of operating from everywhere using the internet. This reduces the everyday travel to and from the office

- **New opportunities:** Freelancers gain new experiences than a traditional employee in areas such as marketing, sales, office administration and customer support.

2.6 Freelancer's Success Factors

Freelancer's success factors mentioned in literature are:

- **Marketplace:** Project's payment type (hourly or fixed), freelancer's capacity (individual or company), presence of a time tracker and freelancer's geographical location are the key features affecting freelance marketplace's market size. Other than above, market size, fees, rules, pre-qualification mechanisms, aesthetics and usability, arbitration mechanisms and project's size are mentioned as candidate success factors (Walter, 2013).
- **Relationships:** According to Rajkumar and Mani (2001), building a relationship through small pilot projects is desirable to increase success. The strength of the relationship is the extent to which the buyer and providers have worked together in the past. It is possible that projects succeed more often when the buyer and provider have worked together on many projects previously.
- **Other Factors**: Product quality, project efficiency factors, cost control factors, and qualifications of the project owner are also important. From these the most important metric to measure the success of projects on freelance marketplaces is the quality in use. Quality in use is the measure of the degree to which the job satisfies the needs and goals of the end users (Walter, 2013).

Freelancing is not for all. Many individuals find that the benefits exceed the possible deadfalls, shortly some professionals will choose that they're just not protected with the freelance work. Therefore, professionals should know factors discouraging freelancing in advance to survive as a freelancer.

2.7 Factors Discouraging Freelancing

Since purpose of this research is to uncover obstacles in the Sri Lankan freelance Information technology market, it is necessary to identify deadfalls. The negative impacts of freelancing have been reported in global context are:

- **Legal problems**: Freelancers need to consider how to protect themselves from lawsuits brought by unhappy clients. Signing and adhering to a detailed contract reviewed by an attorney is important, but isn't necessarily enough to stop a client from claiming negligence or that errors in the work caused problems or financial damage to the company. Many freelancers, particularly those who do work for large companies, purchase errors and omissions insurance, which helps pay for the costs involved in a lawsuit.
- **Dissatisfaction**: If freelancers charge very low amounts, the clients would think that their work is not of good quality, whereas if they charge more, the clients would think that they are too costly to afford. Therefore, before making any bid, freelancers must study the overall trend of the market (Anum, 2012). Internet marketing fields have a slightly lower percentage of satisfied responses compared to information technology and other work. Information Technology fields have the highest level of satisfaction. Typical matters that create dissatisfaction are marketplace policies, lack of project owner's knowledge, difficulty to find quality projects to work on, skills, and experience quality of administration, operating conditions and association with the project owners. IT specialists have stated that the project owner should be technically proficient than internet marketers. The level of satisfaction towards freelance marketplaces is somewhat related to the activity sector (Walter, 2013).
- **No form of strategic planning:** A successful project would be one that is done within the strategic timeline, within the estimated and reasonable budget, and at a satisfactory level. The quality of the project management process deals with the efficiency of the process. A successful project management process typically includes things like having planned all the

requirements right, staying true to the original scope, and good quality assurances practices. Projects of manageable sizes have been identified as being more likely to succeed (Walter, 2013). An essential part of a business plan is that to continue actively associated with it by analyzing it regularly and changing primarily throughout first few months. Most of new companies or individuals who do freelance information technology related work collapse within the first few years because those business had little or no form of planning (Burke, n.d.).

- **A lot of legwork:** Freelancers are responsible for marketing, advertising, and sales indicate a lot of administrative work on their side (Jimenez, 2012).
- **Difficult to distinguish between work and personal time:** Freelancers work for long hours and can be difficult to distinguish between work time and personal life (Jimenez, 2012).
- **Nonpayment risk:** A project can be considered successful when it satisfies the requirements of its users. To parallel freelance marketplaces, a project can be considered a success by one party and a failure by the other. A provider, after having underestimated the scale and scope of a project, could find himself having worked more hours on a project than expected. Since a fixed cost was agreed upon, the provider went over his budgeted amount of man-hours of work for the project. This project would be considered a success by the project owner, since a very low price was achieved, but a failure by the freelancer. The quality of the communication between the buyer and the provider, which allows feedback to be exchanged and to collaborate on the project, could have an important link with success (Walter, 2013). Being a freelancer has the chance of not receiving payment. Nonpayment risk is common in freelancing (Jimenez, 2012).
- **Initial investment is high:** New ventures expect an initial investment. Start-up costs require thousands in upfront cash to purchase computer software and office equipment (Kane, n.d.).

- **Variable workloads:** Freelancers need to study to control unsteady workloads in busy times and lean times and balance various competing preferences and deadlines (Kane, n.d.).
- **Variable income:** Large fluctuations in revenue can make budgeting complex as workload and earnings may differ from period to period (Kane, n.d.).
- **Round the clock coverage:** Freelancers must guarantee 24/7 coverage can be provided, especially for the clients in other time zones (Kane, n.d.). Long hours work will lose productivity.
- **No employer benefits**: Freelancers do not get incentives, grants and bonuses for reaching targets. They must need to operate additional time to adjust circumstances such as illness, emergencies or holidays (Kane, n.d.).
- **Solitude:** Freelancers spend many hours working alone. Some may go days without contacting other people (Suttle, n.d.).
- **Health hazards:** In order to meet deadlines, they need to stay connected 24/7, will reduce their concentration. After looking at the computer screen all day with lack of rest and eyes will start swelling (Here, 2010). Psychological symptoms such as depression, panic as well as physiological signs of headaches, muscle tension perspiration are common among freelancers (Kamenetz, 2013). Freelancers who smoke lead to do it more while working. Extreme smoking causes varieties of short and long term complications (Quintero, 2016).

  Carpal Tunnel Syndrome caused by repetitive motions, can affect their fingers, wrists and hands. At its worst, Carpal Tunnel Syndrome requires surgery to be corrected and has a 6-week recovery period. It is a threat for freelancers and a lot of freelancers have been through it (Stang, 2012).

  Researchers have conducted interviews to investigate freelancer attitudes and experiences in freelancing. They found that individuals with psychological symptoms such as depression, panic as well as physiological signs of headaches and muscle pains (Sage, 2015).

- **Unsuccessful marketplace:** Freelancers need to know their online marketplace would be successful or not in a given industry. This can be done by assessing online marketplaces using six key criteria (Holmes, 2014). These six criteria are distributed three each for project owners and freelancers as shown below.

  For the project owners:

  i. Is it convenient to utilize the marketplace?
  ii. Does the marketplace have a great variety of freelancers?
  iii. Are price and service level transparent?

  For the freelancers:

  i. Does the marketplace implement a system for freelancers to endorse their work to project owners?
  ii. Do the marketplaces support freelancers to improve their productivity?
  iii. Does the marketplace use market networks?

  Another list of features that affect whether an industry is successful in an online marketplace (Ghory, 2014). These list of features are also distributed three each among marketplace and freelancers as shown below.

  Marketplace (Demand side):

  i. How many transactions per year?
  ii. Low merchant support (Do clients frequently change among merchants?)
  iii. Large business (Over $10bn investment or not?)

  Freelancers (Supply side):

  i. Do small freelancers dominate a considerable portion of the business?
  ii. Do project owners investigate a lot before a trade?
  iii. Do marketplaces contribute value-added services?
  iv. Can marketplaces overcome the obstacles for new freelancers to enter the business?

2.8 Summary of Chapter

Past experiences indicate that continuing as a freelancer is very complex from being full-time employee. There are advantages as well as uncertainties for freelancers. There is no globally accepted standard to minimize labour turnover in freelance marketplace. The problems related to freelancers have not been statistically analyzed. Studies have been reported on the problems related of freelancers by various authors in different countries. However, no studies related to discouragements on freelance business have been reported in Sri Lanka.

CHAPTER 3
MATERIALS AND METHODOLOGY

3.1 Introduction

This chapter discusses the materials used and the non-statistical and statistical methodologies used in this study.

3.2 Research Design

Based on the literature review carried out the following obstacles were identified for freelance (Table 3.1). The details of the question numbers are shown in the questionnaire in part B in Appendix A.

Table 3.1: Obstacles and incorporated questions in the questionnaire

Obstacle	**Question Number**
Lack of individual competencies	Q1
Health hazards	Q2
Round the clock coverage	Q3
Nonpayment risk	Q4
No employer benefits	Q5
Contradictory feedback	Q6
Solitude	Q7
No form of strategic planning	Q8
Lot of legwork	Q9
Difficult to allocate work time	Q10
Lack of social recognition	Q11
Variable Income	Q12
Misbeliefs	Q13
No assistance	Q14

To examine the factors that obstruct freelancing, questions related to the above obstacles were included into the questionnaire. The questionnaire consisted 10 questions about the characteristics of the respondent, and 14 questions for collecting ordinal data about freelance obstacles. Each question was a statement followed by a

5 - point Likert Scale; “Strongly Agree’’, “Agree”, “Undecided”, “Disagree” and “Strongly Disagree” respectively, scale 9 was allocated for "Not answered" questions.

The questionnaire was pre-tested by three industry expert to guarantee the it achieves the requirement. Furthermore, various freelancer categories such as independent contractors, moonlighters, etc. were interviewed and received their feedback regarding the questionnaire. An online questionnaire was hosted using google forms to get the instant feedback and only the author of the thesis could access the data of the questionnaire.

3.3 Sampling Frame

A population is the collection of all items of interest (Keller & Warrack, 2000). In this research the population is entrepreneurs and individuals in Sri Lanka that use freelance marketplaces to sellout skills. The sampling frame (total population) is not known. Sample is a set of data drawn from the population, Factors influencing in deciding sample size are type of study being considered, how it will be administered, type of resources available and desired sensitivity and confidence (Keller & Warrack, 2000). Sample size is important to achieve reasonable precision of the estimate the parameters of interest (mean, proportion etc) and to ensure adequate statistical power for the hypothesis test (Black, 2008).

3.3.1 Determination of sample size (for population proportions)

Suppose we desire to estimate of *p*, the proportion of an event in a population based on a sample size of *n*. Let *X* = number of successes in a sample. Then the estimator for the proportion of success (*p*, say) can be obtained by $\hat{p} = \frac{x}{n}$

$X \sim B(n, p) \rightarrow X \sim N(np, npq)$ where $q = 1-p$

Then $\frac{X}{n} = \hat{p} \sim N(p, p^*(1-p)/n)$

Thus $(1-\alpha)$ % CI for the proportion (p) is given by

$$\hat{p} \pm \lambda_{\alpha/2} SD(\hat{p}) = \hat{p} \pm \lambda_{\alpha/2} \times \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \quad \text{-------(1)}$$

As expalined in (1) the quantity $\lambda_{\alpha/2} \times \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ is known as "Expected Margin of Error" .

Let $\delta = \lambda_{\alpha/2} \times \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

$$\text{n} = \frac{\lambda_{\alpha/2}{}^2 p(1-p)}{\delta^2} \quad \text{----------(2)}$$ where δ is the desired error

However, p is not known and p(1-p) is maximized at p=0.5, p was taken as 0.5 (Charan & Biswas, 2013). Thus for the desired margin of error of 5%. The required sample size at 95% significant level is given by,

$$\text{n} = \frac{(1.96)^2 * (0.50) * (0.50)}{(0.05)^2} = 384$$

However, due to practical problem sample size was reduced to 300. In fact a sample of size of 300 has been recommended as suitable sample size for factor analysis (FA) by many authors (Field, 2009; Comrey & Lee, 1992; Tabachnick & Fidel, 2007).

3.3.2 Sampling technique

As there is no list has been established for freelancers, sample frame is unknown. However, by searching internet above 360 freelancers were found. Out of them 300 was selected randomly. Thus the sampling technique is simple random sampling.

3.4 Statistical Methodology

The observed data do not have a dependent variable, but it has many explanatory variables either in categorical types (ordinal and nominal) or continuous type. Thus data mining technique in multivariate environment, known as Exploratory Factor Analysis(EFA) is used in this study.

3.4.1 Objectives of exploratory factor analysis

Exploratory Factor Analysis is a statistical technique adopted to reveal the underlying constructs of a large set of correlated variables (Maamri & Triki, 2013). It helps to identify the factors that influence the data set. The objectives of Factor Analysis are (Williams et al., 2010):

- Reduction of observed correlated variables. (manifest variables)
- Inspect the relationship among the observed variables.
- Identify common factors to explain the correlation structure among observed variables.

3.4.2 Validation of data for factor analysis

For the feasibility of FA, the Kaiser-Meyer-Olkin (KMO) test and the Bartlett's Test of Sphericity should be done initially (Akar & Topçu, 2011). The Kaiser-Mayer-Olkin (KMO) statistic is a measure of sampling adequacy varies from 0 to 1 (Uddin et al., 2014). KMO should be well above the minimum criterion of 0.5 to be adequate for testing. It has been recommended to use data for FA, if KMO statistic is greater than 0.6 (Hutcheson and Sofroniou, 1999). The observed variables should be highly correlated. Factor analysis should be done utilizing a correlation matrix that delivers standardized data to bypass items from different scales (Fung, 1995).

Bartlett's test is applied to test if the population correlation matrix (R-matrix) is an identity matrix I_p (Field, 2009). That is whether there exist significant correlations among variables.

H_0: $R = I_p$ vs H_1: $R \neq I_p$

Larger values (greater than 0.05) of the significance level show that variables are unrelated and not suitable for FA.

3.4.3 Factors extraction method

There are various methods to extract factors. They are Principal component analysis (PCA), Principal axis factoring (PAF), Image factoring, Maximum likelihood and Alpha factoring. According to Yong & Pearce (2013) “Exploratory Factor Analysis”

guide, Tabachnick & Fidell (2007) showed PCA is applied to obtain the highest variance, reducing a large number of variables into a smaller number of components. Costello & Osborne (2005) stated Principal Components presents components while Principal Axis Factor presents factors. The factor loadings are somewhat alike and require to make rotation without considering the extraction technique (Tabachnick & Fidell, 2007). Principal Factor Analysis (PFA) or Principal Axis Factoring is acceptable when the data violate the assumption of multivariate normality (Costello & Osborne, 2005), factors are obtained one by one until there is substantial variance estimated in the correlation matrix (Tucker & MacCallum, 1997). Pett et al. (2003) advised applying PCA in conducting preliminary analysis in EFA. However other methods can also be tried to check whether the results are invariant of the type of factor extraction method.

3.4.4 The number of factors to retain

The eigenvalues and scree test are applied to decide the number of factors to retain for the FA model (Yong & Pearce, 2013).

- **Kaiser's criterion**: This criterion recommends retaining all factors that are above the eigenvalue of 1 (Kaiser, 1960).
- **Jolliffe's criterion**: This criterion recommends retaining all factors that are above the eigenvalue of 070 (Jolliffe, 1986).

It is advised to apply the scree test along with the eigenvalues to decide the number of factors to retain (Yong & Pearce, 2013).

3.4.5 Selection of rotational method

The factor loadings are somewhat alike and require to make rotation without considering the extraction technique (Tabachnick &Fidell, 2007). Rotation maximizes high item loadings and minimizes low item loadings, delivers a simplified solution (Williams et al., 2010). Orthogonal rotation is used when the factors are rotated 90° from each other, and it is assumed that the factors are uncorrelated (DeCoster, 1998; Rummel, 1970). The most common orthogonal rotational technique is Varimax rotation (Yong & Pearce, 2013). Factors are considered to be correlated in Oblique rotation. Oblique rotation generates two matrices. Pattern matrix includes

factor loadings. Factor correlation matrix contains the correlations between the factors. The common oblique rotation techniques are Direct Oblimin and Promax (Yong & Pearce, 2013).

3.4.6 Interpretations of factor loadings

Factor loadings greater than 0.32, using an alpha level of .01 (two-tailed), for a sample size of at least 300, describe how much a factor describes a variable in FA (Tabachnick & Fidell, 2007). However, this has to be adjusted depending on the problem and the factor. Bartlett method (or regression approach) which generates unbiased factor scores that are correlated only with their own factor specifying how much an individual would score on a factor (Tabachnick & Fidell, 2007). Naming factors generally should be done in consultation with the experimenter. The largest absolute loading for a variable is the most important the variable used to interpret the factor. The sign of the loadings also needs to be considered in labeling the factors (Bruin, 1995).

3.4.7 The communality

The communality is the variance in the observed variables which are accounted for by a common factor or common variance (Child, 2006). The communality is the variance accounted for by the common factors and a particular set of factors is said to explain a lot of the variance of a variable if it has a high communality (Kline, 1994). The communality is denoted by h^2 and is the summation of the squared correlations of the variable with the factors (Cattell, 1973). In terms of the variance the unique factors are never correlated with the common factors; however, the common factors may be uncorrelated or correlated with each other (Harman, 1976). Generally, the cumulative percentage of variance is extracted after each factor is removed from the matrix, and this cycle continues until approximately 75-85% of the variance is accounted for (Gorsuch, 1983). The percentage variance tells us how much each factor contributed to the total variance. Often variables with low communalities (less than .20 so that 80% is unique variance) are eliminated from the analysis since the aim of Factor Analysis is to try and explain the variance through the common factors (Child, 2006).

3.5 Chi-Squre Anaysis

The association among two categorical variables is tested utilizing likelihood ratio chi-square test statistics, regardless of the size of the observed frequency (Peiris,2014) where null hypothesis H_0: There is no significance association between two categorical variables.

CHAPTER 4
PRELIMINARY ANALYSIS

4.1 Introduction

The aim of this chapter is to find the distributions of various demographic and other variables directly related to freelance activities. Furthermore, the impact of related variables is analyzed using 2-way contingency tables.

4.2 Demographic Analysis

Demographic analysis described the personal characteristics of the sample based on the demographic variables such as age, gender, highest educational qualification and experience in freelancing.

The sample consisted of 69.7% males and 30.3% females, indicating that freelance industry is dominated by males. Majority of the freelance persons were relatively younger (57.3%), that is aged less than 40 years. Out of 300 sample, 137 (45.7%) of individuals did freelancing to make extra income and 135 (45%) did as a hobby. 28 (9.3%) of individuals had other reasons. 96(32%) of respondents stopped freelancing due to work pressure, 62(20.7%) of them stopped to accept a better job. Married freelancers 44(14.7%) left freelancing as it is more important to attend family matters than to get involved in freelancing.

4.2.1 Distribution of the highest education qualification

Table 4.1: Distribution of the highest education level

Education Level	Frequency	Percentage (%)	Cumulative Percentage (%)
Still Schooling	3	1.0	1.0
G.C.E Ordinary Level	13	4.4	5.4
G.C.E Advanced Level	42	14.0	19.4
Higher Diploma	103	34.3	53.7
Bachelor's Degree	103	34.3	88.0
Master's Degree	36	12.0	100.0
Total	**300**	**100.0**	

The distribution of the sample by educational qualification is presented in Table 4.1. Results indicate that the respondents are well educated, with 80.6% of them having a higher diploma or better. The most frequently encountered education levels by the freelancers were higher diploma (34.3%) and bachelor's degree (34.3%).

4.2.2 Distribution of sector

Table 4.2: Sector of activity distribution

Sector	**Frequency**	**Percentage (%)**	**Cumulative Percentage (%)**
Website & Software Development	52	17.3	17.3
Hardware Support	6	2.0	19.3
Computer Aided Design	30	10.0	29.3
Data Entry	43	14.4	43.7
Paid to Click	11	3.7	47.4
Survey	16	5.3	52.7
Sales & Marketing	17	5.7	58.4
Product Sourcing	18	6.0	64.4
Accounting & Legal	18	6.0	70.4
Teaching	18	6.0	76.4
Writing	7	2.3	78.7
Entertainment	17	5.7	84.4
Gambling	19	6.3	90.7
Other	28	9.3	100.0
Total	**300**	**100.0**	

According to Table 4.2, majority of respondents (17.3%) worked in website & software development activities. Only very few (2%) involved in hardware support.

4.2.3 Distribution of experience with freelance marketplaces

Table 4.3: Distribution of experience (in years) with freelance marketplaces

Experience	Frequency	Percentage (%)	Cumulative Percentage (%)
Less than 1 year	67	22.3	22.3
1 to 2 years	153	51.0	73.3
More Than 2 years	80	26.7	100.0
Total	**300**	**100**	

The majority of respondents in Table 4.3, 51% had between 1 to 2 years of experience with freelance marketplaces but not performing freelancing at present. Only 22.3% of respondents stopped freelancing within first year. Table 4.3 also indicate that the percentages of experienced professionals more than 2 years are low as 26.7%. This shows that working in freelance market is not very profitable for professionals with more than two years of working experience.

4.2.4 Distribution of freelance type

Table 4.4: Distribution of freelance type

Freelance Type	Frequency	Percentage (%)	Cumulative Percentage (%)
Diversified worker	55	18.3	18.3
Freelance Business Owner	33	11.0	29.3
Independent contractor	65	21.7	51.0
Moonlighter	120	40.0	91.0
Temporary Worker	27	9.0	100.0
Total	**300**	**100.0**	

Majority of respondents are moonlighters (40%) followed by individual contractors (21.7%) as shown in Table 4.4. 11% of the respondents worked as freelance business owners. Freelance business owners and temporary workers are relatively small in numbers.

4.2.5 Impact of various reasons to stop freelancing

57.6% of freelancers were isolated and insecure in the freelance market since they don't have the experience, knowledge or infrastructure to do the job efficiently. Too many targets and uncompleted managerial tasks can cause heavy stress. Freelancing is an international competition. 147(48.7%) of the respondents are suffering from work-related health issues since they have no time to do physical exercises. 123(41%) agreed that they always under stress because unable to work independently with little direction.

Only very few, 51(17%) disagreed that overseas clients are counting on Sri Lankans to deliver quality 24X7 service on time for fewer rates than Indian & Chinese freelancers. Freelancers from software and web development always loose creativity and confidence from client testimonials and recommendation, received contradictory feedback since the first project not being performed skillfully. Out of 300, 133(44.3%) stated they always lose confidence from client testimonials and recommendations.

In the sample, 161(57%) of respondents admitted Sri Lankan freelancing industry is discouraged by lack of social recognition and attitudes towards freelancers. Since most of the freelancers are moonlighters, 211(70.3%) agreed that permanent freelancing is a difficult when having a good full-time job. Freelancers of 25.3% retreated from the freelance profession permanently but 74.7% of freelancers responded that they will return to freelancing again. This shows improvement of freelance IT can be accomplished.

4.2.6 Associations between gender and various obstacles in freelancing

The status of agreement for various reasons to stop freelancing was obtained from the respondents and the results are analyzed with 2-way contingency tables. Likelihood chi square statistic is used in this analysis. Summary results of the associations are shown in Table 4.5.

Table 4.5: Associations between gender and obstacles in freelancing

Obstacle	**Question Number**	**Chi-square Statistic $\chi^2(4)$**	**Probability**
Lack of individual competencies	Q1	14.419	0.006
Health hazards	Q2	8.508	0.076
Round the clock coverage	Q3	1.102	0.894
Nonpayment risk	Q4	1.646	0.801
No employer benefits	Q5	0.925	0.921
Contradictory feedback	Q6	3.885	0.422
Solitude	Q7	1.549	0.818
No form of strategic planning	Q8	3.37	0.498
Lot of legwork	Q9	5.145	0.273
Difficult to allocate work time	Q10	4.596	0.331
Lack of social recognition	Q11	2.918	0.572
Variable Income	Q12	0.467	0.977
Misbeliefs	Q13	6.254	0.181
No assistance	Q14	5.167	0.271

Results in Table 4.5 indicate that there is a statistically significant association between lack of individual competencies and gender as the probability value of the chi square statistic (p =0 .006) is less than 5% level of significance. 113 males confirmed that if freelancers do not improve their skill set, they will be isolated in freelance market. This also indicates that if a person is not a good time-manager, not a good finance-manager nor a person with self–discipline will feel insecure as a freelancer.

There are no statistically significant associations between reasons Q2 to Q14 and gender since probability value of the chi square statistic is greater than 5% level of significance in Table 4.5.

4.2.7 Associations between age and various obstacles in freelancing

Summary results of the chi-square tests to find the associations between age and 14 variables (Q1-Q14) are shown in Table 4.6. The descriptions of Q1-Q14 are shown in questionnaire in Appendix A (Section B).

Table 4.6: Associations between age and obstacles in freelancing

Obstacle	**Question Number**	**Chi-square Statistic $\chi^2(4)$**	**Probability**
Lack of individual competencies	Q1	7.132	0.129
Health hazards	Q2	1.699	0.791
Round the clock coverage	Q3	1.813	0.77
Nonpayment risk	Q4	6.486	0.165
No employer benefits	Q5	1.243	0.871
Contradictory feedback	Q6	1.997	0.736
Solitude	Q7	8.252	0.083
No form of strategic planning	Q8	5.052	0.282
Lot of legwork	Q9	5.723	0.221
Difficult to allocate work time	Q10	4.349	0.361
Lack of social recognition	Q11	5.803	0.214
Variable Income	Q12	2.017	0.733
Misbeliefs	Q13	0.639	0.959
No assistance	Q14	1.225	0.874

Table 4.6 shows that there are no statistically significant associations between all the reasons and age since probability value of the chi square statistic is greater than 5% level of significance.

4.2.8 Associations between education and various obstacles in freelancing

Summary results of the associations are shown in Table 4.7.

Table 4.7: Associations between reasons to stop freelancing and education

Obstacle	Question Number	Chi-square Statistic $\chi^2(4)$	Probability
Lack of individual competencies	Q1	1.323	0.857
Health hazards	Q2	0.954	0.917
Round the clock coverage	Q3	9.693	0.046
Nonpayment risk	Q4	4.193	0.381
No employer benefits	Q5	7.249	0.123
Contradictory feedback	Q6	3.25	0.517
Solitude	Q7	2.182	0.702
No form of strategic planning	Q8	7.658	0.105
Lot of legwork	Q9	5.097	0.278
Difficult to allocate work time	Q10	4.231	0.376
Lack of social recognition	Q11	4.068	0.397
Variable Income	Q12	13.675	0.008
Misbeliefs	Q13	2.902	0.574
No assistance	Q14	3.589	0.464

There is a statistically significant association between round the clock coverage and education (Table 4.7) since probability of the chi square statistic 0.046 is less than 0.05. Another statistically significant association between variable income and education can be seen (Table 4.7) since probability of the chi square statistic 0.008 is less than 0.05. Table 4.7 shows that there are no statistically significant associations between all the other reasons and education since probability value of the chi square statistic is greater than 5% level of significance.

4.3 Summary

Freelancing is popular among unmarried younger generation but freelancing is discouraged by social recognition and attitudes. Most of them are freelancing to make extra income or as a hobby. Married freelancers leave freelancing due to family matters. Most of the freelancers are suffering from work-related health issues since

they have no time to do physical exercises. Only three significant associations were found between reasons to stop freelancing and the demographic variables. The such association was found between (i) lack of individual competencies & gender, (ii)round the clock coverage & education and (iii) variable income and education.

CHAPTER 5
IDENTIFICATION OF FACTORS

5.1 Introduction

Objective of this analysis is to find out whether it is reasonable to assume that there are few underlying common factors which may have given rise to the correlations between the given 14 variables (Table 3.1).

5.2 Validation of Data for Factor Analysis

The Bivariate Correlation matrix, KMO and Bartlett's coefficients were obtained in order to test the association among observed variables and to check the validity of the data set for FA.

5.2.1 Significance of the correlation matrix

To test the association among observed 14 variables, bivariate correlation statics were obtained and shown in Table 5.1.

Table 5.1: Correlation Matrix of variables

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
Correlation	Q1	1.000	.487	.294	.357	.344	.404	.370	.439	.431	.510	.385	.392	.236	.374
	Q2	.487	1.000	.331	.440	.348	.398	.445	.364	.392	.497	.372	.350	.292	.472
	Q3	.294	.331	1.000	.483	.197	.306	.345	.475	.298	.242	.239	.479	.170	.265
	Q4	.357	.440	.483	1.000	.238	.310	.440	.396	.391	.466	.349	.485	.299	.463
	Q5	.344	.348	.197	.238	1.000	.699	.297	.356	.328	.341	.637	.219	.210	.298
	Q6	.404	.398	.306	.310	.699	1.000	.396	.480	.379	.414	.582	.353	.277	.369
	Q7	.370	.445	.345	.440	.297	.396	1.000	.514	.469	.428	.373	.528	.373	.451
	Q8	.439	.364	.475	.396	.356	.480	.514	1.000	.478	.341	.504	.467	.171	.309
	Q9	.431	.392	.298	.391	.328	.379	.469	.478	1.000	.472	.395	.450	.267	.409
	Q10	.510	.497	.242	.466	.341	.414	.428	.341	.472	1.000	.431	.393	.413	.484
	Q11	.385	.372	.239	.349	.637	.582	.373	.504	.395	.431	1.000	.332	.268	.318
	Q12	.392	.350	.479	.485	.219	.353	.528	.467	.450	.393	.332	1.000	.256	.373
	Q13	.236	.292	.170	.299	.210	.277	.373	.171	.267	.413	.268	.256	1.000	.545
	Q14	.374	.472	.265	.463	.298	.369	.451	.309	.409	.484	.318	.373	.545	1.000
Sig. (1-tailed)	Q1		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Q2	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Q3	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.000
	Q4	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Q5	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	Q6	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	Q7	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	Q8	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.001	.000
	Q9	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	Q10	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	Q11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	Q12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	Q13	.000	.000	.002	.000	.000	.000	.000	.001	.000	.000	.000	.000		.000
	Q14	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	

According to the results in Table 5.1, all pairs of correlations are highly significant positive with zero probability values. Thus it can be concluded that all the correlations are significantly greater than zero and strong.

5.2.2 KMO and Bartlett's test statistics

Table 5.2: Results of KMO measure of sampling adequacy

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.899
Bartlett's Test of Sphericity	Approx. Chi-Square	1785.518
	df	91
	Sig.	0.000

The KMO statistics is 0.897 is above the minimum criterion of 0.6 (Table 5.2) shows the sample size is adequate for the FA. The statistic of the Bartlett's test of sphericity is significant as value 0.00 (< 0.05). Thus the null hypothesis that the correlation matrix is an identity matrix can be rejected. It can be concluded with 95% confidence that the correlation matrix is significantly different from the identity matrix and FA can be applied for the sample data.

5.3 Extraction of Common Factors

Table 5.3: Results of Eigen analysis without rotation

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.029	43.065	43.065	6.029	43.065	43.065
2	1.360	9.717	52.782	1.360	9.717	52.782
3	1.177	8.409	61.192	1.177	8.409	61.192
4	.811	5.790	66.982			
5	.723	5.166	72.147			
6	.574	4.098	76.246			
7	.549	3.924	80.170			
8	.514	3.668	83.838			
9	.491	3.509	87.347			
10	.436	3.112	90.459			
11	.398	2.842	93.301			
12	.372	2.657	95.958			
13	.322	2.298	98.256			
14	.244	1.744	100.000			

Three components had eigenvalues greater than Kaiser's criterion of 1 after using principal component analysis (PCA) factor extraction method (Table 5.3). This indicates the 14-dimension system can be reduced into 3-dimension system. This factor structure described 61.2% total variability of the system. Factor 1 contributed the highest variation of 43.1% while 9.72% of variance is explained by factor 2 and 8.4% of the variance is explained by factor 3. All other remaining factors are not that significant.

5.4 Scree Plot

It can be clearly seen that the curve (Figure 5.1) begins to flatten between factor 2 and 4. But the factor 4 and others have Eigen values less than 1. It is logical to extract three factors.

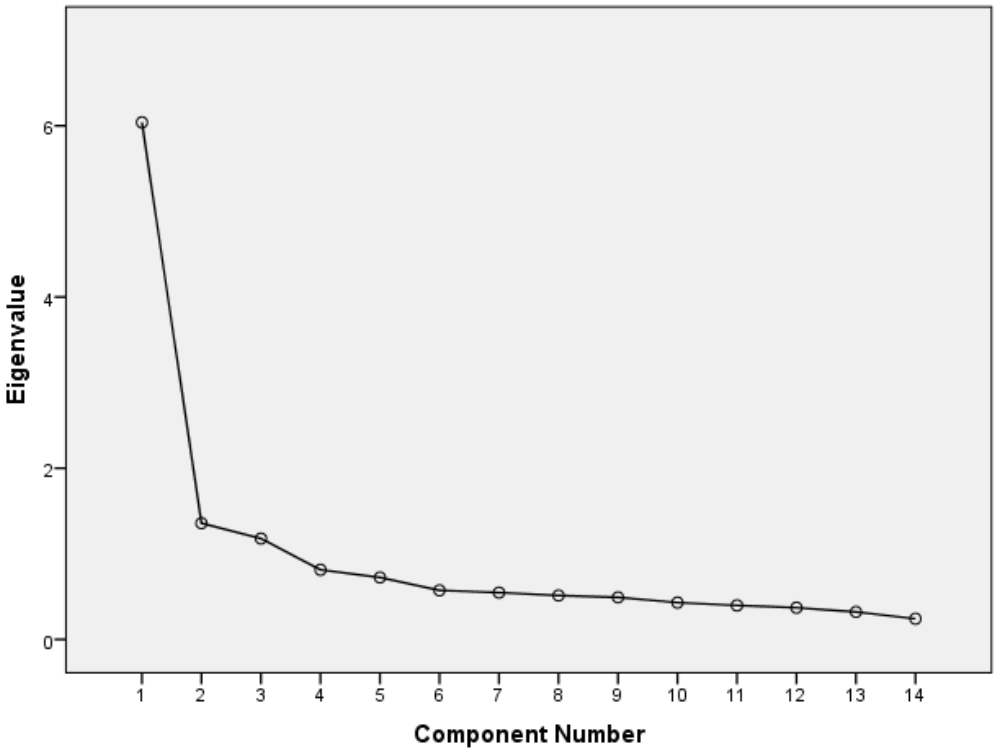

Figure 5.1: Scree plot

5.5 Rotated Component Matrix: Orthogonal Rotation

Table 5.4, Table 5.5 and Table 5.6 show the rotated factor matrices (factor loading matrices) when the 3-factor model were rotated using Varimax, Quartimax and Equamax respectively.

Table 5.4: Factor loadings of 3-factor model after Varimax rotation

	Component			
Question	**1**	**2**	**3**	**Communalities**
Q1	**.403**	.380	.362	0.438
Q2	.370	.304	**.506**	0.485
Q3	**.786**	.081	.025	0.625
Q4	**.623**	.087	.414	0.567
Q5	.056	**.880**	.150	0.800
Q6	.233	**.796**	.208	0.732
Q7	**.556**	.223	.426	0.540
Q8	**.679**	.448	.042	0.664
Q9	**.488**	.317	.357	0.467
Q10	.279	.317	**.644**	0.593
Q11	.228	**.778**	.198	0.696
Q12	**.739**	.120	.247	0.622
Q13	.019	.082	**.804**	0.654
Q14	.237	.155	**.777**	0.684

Table 5.5: Factor loadings of 3-factor model after Quartimax rotation

Question	Component			Communalities
	1	2	3	
Q1	**.619**	.220	.081	0.438
Q2	**.642**	.143	.227	0.485
Q3	**.677**	-.144	-.382	0.625
Q4	**.742**	-.127	.035	0.567
Q5	.371	**.813**	.040	0.800
Q6	.520	**.679**	.006	0.732
Q7	**.731**	.021	.070	0.540
Q8	**.702**	.236	-.339	0.664
Q9	**.668**	.136	.038	0.467
Q10	**.642**	.170	.391	0.593
Q11	.506	**.664**	.001	0.696
Q12	**.762**	-.113	-.170	0.622
Q13	.443	.003	**.676**	0.654
Q14	**.628**	.015	.537	0.684

Table 5.6: Factor loadings of 3-factor model after Equamax rotation

Question	Component			Communalities
	1	2	3	
Q1	**.391**	0.389	.366	0.438
Q2	.354	.315	**.510**	0.485
Q3	**.784**	.097	.038	0.625
Q4	**.614**	.102	.425	0.567
Q5	.036	**.882**	.145	0.800
Q6	.213	**.802**	.206	0.732
Q7	**.544**	.237	.434	0.540
Q8	**.669**	.462	.050	0.664
Q9	**.475**	.329	.363	0.467
Q10	.261	.327	**.647**	0.593
Q11	.208	**.784**	.196	0.696
Q12	**.732**	.136	.259	0.622
Q13	.003	.088	**.804**	0.654
Q14	.220	.166	**.780**	0.684

Results in Tables 5.4 to 5.6 also indicate that communalities for each variable is above 0.4 confirming that 3-factor model is suitable. In fact, the selected variables

within each factor is highlighted considering critical values as 0.3 and not taking the same variables to be included for more than one factor. The selected variables for each factor under different rotation are show in Table 5.7.

Table 5.7: Summary of variables to be included in the 3-factor model

Factors	**Varimax Rotation**	**Quartimax Rotation**	**Equamax Rotation**
Factor 1	Q1, Q3, Q4, Q7, Q8, Q9, Q12	Q1, Q2, Q3, Q4, Q7, Q8, Q9, Q10, Q12, Q14	Q1, Q3, Q4, Q7, Q8, Q9, Q12
Factor 2	Q5, Q6, Q11	Q5, Q6, Q11	Q5, Q6, Q11
Factor 3	Q2,Q10, Q13, Q14	Q13	Q2, Q10, Q13, Q14

Results in Table 5.7 indicate that the variables identified for each factor are the same for Varimax and Equamax rotations. According to output 5.7, common themes can be identified for each factors. The three factors that emerged from this analysis can be labeled as; Freelance Market Restraints, Professional Restraints and Social & Personal Restraints.

5.6 Factor Score Coefficient Matrix

The results of factor score coefficients of the 3-factor model under Varimax rotation are shown in Table 5.8. Of the three orthogonal rotations Varimax is the most popular one. Further, it attempts to distribute the variance more symmetrically than other two methods (Table 5.8). Thus for the further analysis Varimax rotation was considered.

Table 5.8: Component Score Coefficient Matrix using Varimax rotation

Question	Component		
	1	2	3
Q1	**.061**	.073	.056
Q2	.020	.011	**.169**
Q3	**.419**	-.110	-.199
Q4	**.228**	-.144	.085
Q5	-.176	**.459**	-.075
Q6	-.075	**.368**	-.070
Q7	**.161**	-.056	.086
Q8	**.284**	.115	-.226
Q9	**.122**	.022	.043
Q10	-.068	.012	**.275**
Q11	-.072	**.360**	-.071
Q12	.329	-.118	-.055
Q13	-.210	-.099	**.483**
Q14	-.094	-.095	**.398**

Table 5.9: Total variance explained after factor rotation

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	3.104	22.175	22.175
2	2.760	19.717	41.892
3	2.702	19.300	61.192

Factor 1 explained 22.18% of the total variability. Factor 2 and Factor 3 explained 19.72% and 19.3% of the total variability respectively (Table 5.9).

Factor 1: Freelance Market Restraints

It can be formed as a linear combination of eight observed variables namely Q1, Q3, Q4, Q7, Q8, Q9, Q12.

Factor 1 = 0.061* lack of individual competencies + 0.419* round the clock coverage + 0.228* nonpayment risk + 0.161* solitude + 0.284* no form of strategic planning + 0.122* lot of legwork + 0.329* variable income

Factor 2: Pro,fessional Restraints

It can be formed as a linear combination of Q5, Q6 and Q11.

Factor 2= 0.459* no employer benefits + 0.368* contradictory feedback + 0.360* lack of social recognition

Factor 3: Social and Personal Restraints

This can be formed as a linear combination of Q2, Q10, Q13 and Q14.

Factor 3= 0.169*health hazards + 0.275*difficult to allocate work time + 0.483 *misbeliefs + 0.398* no assistance

5.7 Oblique Rotation

In order to find whether the factors can be improved by non-orthogonal rotating, Non orthogonal (oblique) rotation was carried out using Direct Oblimin method in SPSS. The factor matrix is split into two matrixes called: (i) the Pattern Matrix (Table 5.10) and (ii) the Structure Matrix (Table 5.11).

Table 5.10: Pattern Matrix under oblique rotation

Question	Component		
	1	2	3
Q1	**0.310**	-0.293	0.244
Q2	0.265	-0.192	**0.421**
Q3	**0.864**	0.059	-0.154
Q4	**0.606**	0.085	0.317
Q5	-0.151	**-0.952**	-0.009
Q6	0.050	**-0.815**	0.043
Q7	**0.499**	-0.079	0.318
Q8	**0.661**	-0.368	-0.177
Q9	**0.419**	-0.208	0.233
Q10	0.134	-0.203	**0.592**
Q11	0.051	**-0.797**	0.035
Q12	**0.759**	0.044	0.101
Q13	-0.142	0.018	**0.867**
Q14	0.092	-0.009	**0.784**

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 9 iterations.

In Table 5.10, same variables are included for the three factors.

Table 5.11: Structure Matrix under oblique rotation

Question	Component		
	1	2	3
Q1	0.537	-0.520	0.486
Q2	0.521	-0.468	0.605
Q3	0.775	-0.252	0.180
Q4	0.700	-0.297	0.534
Q5	0.254	-0.884	0.297
Q6	0.417	-0.853	0.379
Q7	0.664	-0.416	0.555
Q8	0.745	-0.583	0.238
Q9	0.605	-0.478	0.487
Q10	0.465	-0.489	0.726
Q11	0.407	-0.832	0.364
Q12	0.782	-0.321	0.398
Q13	0.208	-0.256	0.801
Q14	0.419	-0.351	0.826

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

The structure matrix (Table 5.11) shows factors 1 and 3 “Freelance Market Restraints” and “Social and Personal Restraints” go together. However, the factors obtained by oblique rotation are not orthogonal and difficult to interpretation. Thus the 3 factors obtained from orthogonal Varimax rotation is recommended.

5.8 Validation of the3-Factor Model

Reproduced Correlations using Varimax rotation are used to Test the Model Fit (Table 5.12).

Table 5.12: Reproduced Correlation Matrix using Varimax rotation

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
Reproduced Correlation	Q1	.438[a]	.448	.357	.434	.412	.472	.463	.459	.447	.466	.459	.433	.330	.436
	Q2	.448	.485[a]	.328	.466	.364	.433	.489	.408	.458	.526	.420	.434	.439	.528
	Q3	.357	.328	.625[a]	.507	.119	.253	.466	.571	.418	.261	.247	.597	.041	.218
	Q4	.434	.466	.507	.567[a]	.173	.300	.542	.479	.480	.468	.291	.573	.352	.483
	Q5	.412	.364	.119	.173	.800[a]	.745	.291	.439	.360	.392	.727	.184	.194	.267
	Q6	.472	.433	.253	.300	.745	.732[a]	.396	.524	.440	.452	.714	.319	.237	.341
	Q7	.463	.489	.466	.542	.291	.396	.540[a]	.495	.494	.500	.384	.543	.372	.498
	Q8	.459	.408	.571	.479	.439	.524	.495	.664[a]	.488	.358	.511	.566	.083	.263
	Q9	.447	.458	.418	.480	.360	.440	.494	.488	.467[a]	.467	.428	.487	.323	.443
	Q10	.466	.526	.261	.468	.392	.452	.500	.358	.467	.593[a]	.438	.403	.549	.616
	Q11	.459	.420	.247	.291	.727	.714	.384	.511	.428	.438	.696[a]	.310	.227	.328
	Q12	.433	.434	.597	.573	.184	.319	.543	.566	.487	.403	.310	.622[a]	.222	.386
	Q13	.330	.439	.041	.352	.194	.237	.372	.083	.323	.549	.227	.222	.654[a]	.642
	Q14	.436	.528	.218	.483	.267	.341	.498	.263	.443	.616	.328	.386	.642	.684[a]
Residual[b]	Q1		.040	-.063	-.077	-.067	-.068	-.093	-.020	-.016	.044	-.074	-.041	-.094	-.061
	Q2	.040		.004	-.027	-.016	-.035	-.043	-.044	-.066	-.029	-.048	-.085	-.147	-.056
	Q3	-.063	.004		-.024	.078	.054	-.120	-.096	-.121	-.019	-.008	-.118	.129	.047
	Q4	-.077	-.027	-.024		.064	.010	-.102	-.083	-.089	-.003	.058	-.088	-.053	-.020
	Q5	-.067	-.016	.078	.064		-.046	.005	-.082	-.031	-.051	-.090	.035	.016	.031
	Q6	-.068	-.035	.054	.010	-.046		.000	-.044	-.062	-.038	-.132	.034	.040	.028
	Q7	-.093	-.043	-.120	-.102	.005	.000		.019	-.025	-.073	-.012	-.015	.002	-.047
	Q8	-.020	-.044	-.096	-.083	-.082	-.044	.019		-.010	-.017	-.007	-.099	.088	.046
	Q9	-.016	-.066	-.121	-.089	-.031	-.062	-.025	-.010		.005	-.033	-.037	-.055	-.034
	Q10	.044	-.029	-.019	-.003	-.051	-.038	-.073	-.017	.005		-.007	-.010	-.137	-.132
	Q11	-.074	-.048	-.008	.058	-.090	-.132	-.012	-.007	-.033	-.007		.022	.041	-.011
	Q12	-.041	-.085	-.118	-.088	.035	.034	-.015	-.099	-.037	-.010	.022		.034	-.013
	Q13	-.094	-.147	.129	-.053	.016	.040	.002	.088	-.055	-.137	.041	.034		-.097
	Q14	-.061	-.056	.047	-.020	.031	.028	-.047	.046	-.034	-.132	-.011	-.013	-.097	

The lower section triangle of the Table 5.12 shows that the residuals are close to zero. There are 38 residuals (41%< 50%) that are greater than 0.05. Therefore, it can be concluded that the three factors that were extracted can be used to signify the original data.

CHAPTER 6
CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The main purpose of this study is to determine the obstacles behind the freelancing community in Sri Lanka and recommend strategies on retaining freelancers. Based on the results derived in Chapter 4 and Chapter 5 and the corresponding discussions, the following conclusions can be made.

- Three factors "Freelance Market Restraints", "Professional Restraints" and "Social and Personal Restraints" are found as obstacles in freelancing.
- Freelance market restraints increase with increasing scores for lack of individual competencies, round the clock coverage, nonpayment risk, solitude, no form of strategic planning, lot of legwork and variable income. As each of these variables increase, so do the other seven.
- Professional restraints increase with increasing scores for health hazards, no employer benefits, contradictory feedback and lack of social recognition. As each of these variables increase, so do the other three.
- Social and personal restraints increase with increasing scores for difficult to allocate work time, misbeliefs and no assistance. As each of these variables increase, so do the other four.
- The freelance industry is dominated by males, popular among unmarried younger generation. They are freelancing to make extra income or as a hobby for at least one to two years. Married freelancers leave freelancing as it is more important to attend family matters than to get involved in freelancing.
- Freelancers are not unemployed in Sri Lanka individuals but moonlighters with multiple jobs. This study shows they leave freelancing due to work pressure for a short period. Some may use freelancing as a stepping stone only, leave freelancing within two years to accept a better permanent job as they committed to putting time but have no adequate capital to contribute.

- The most frequent active sectors were found as software & web development, data entry, survey & graphic design. Only few individuals from hardware support are using freelance marketplaces and others are related to marketing activities.
- Overseas projects increase the risk as clients are pushing on freelancers to deliver quality services on time for fewer rates than Indian & Chinese professionals. Freelancers from software and web development always loose creativity and confidence from client testimonials and recommendations.
- Freelancers are under stress because they receive contradictory feedback since the first project not being performed skillfully.
- Due to the work pressure freelancers retire from the freelance profession after few months.
- Most of the freelancers are suffering from work-related health issues since they have no time to do physical exercises.

6.2 Recommendations

- It is recommended that the authorities should pay attention to areas such as; freelance market place matters, working condition, living condition, family matters and healthcare.
- It is necessary to motivate freelancers through recognition, giving assistance for growth and arranging workshops to share knowledge.
- The authorities have to understand that the people are different and need to respect these differences such as; gender, nationality, age and service length.
- Increase commitment, develop problem solving skills, make good filtration system for marketplaces, use social media, be creative, reward loyal customers, make a marketing/business plan.
- Freelancers have to make sure that their skill profiles are realistic and Information must be transparent.

6.3 Suggestions

- This study is not executed from the project owner's point of view, but from the freelancer's point of view. Thus it is recommended that the study to be extended to all areas such as freelancers, project owners and the market.

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APPENDIX A

QUESTIONNAIRE TO IDENTIFY OBSTACLES BEHIND THE FREELANCING COMMUNITY IN SRI LANKA

Dear Sir/Madam,

I am Roshana Seneviratne (roshana@kdu.ac.lk - 0718356688), software engineer in the General Sir John Kotelawala Defence University. I am a MSc student at University of Moratuwa following a Master of Science Degree in BusinessStatistics. The objective of my research is to identify the obstacles behind the IT freelancing community in Sri Lanka. I need your help to gather data to test my objectives of the study. Data will be treated as confidential.

Thank You

Yours Faithfully,

Roshana Seneviratne

Section A (Demographic Factors)

Please mark an "X" in the most appropriate answer.

1.Are you male or female?

- Male
- Female

2. Age: (Years)

- Less than 20
- 20 to 39
- 40 to 60
- Above 60

3. E-mail or contact details.

4. Why did you decide to freelance?

- Mark only one oval.
- Earn extra income
- As a hobby
- Other

5. What is the Scenario that Applies to you?
    - Independent contractor ("traditional" freelancer don't have an employer and full-time employment)
    - Moonlighter (Does freelancing after their traditional nine to five job, work on a project, normally at night)
    - Diversified worker (People with multiple sources of income from a mix of traditional employers and freelance work)
    - Temporary Worker (Individuals with a single employer, client, job, or contract project where their employment status is temporary)
    - Freelance Business Owner (Who have up to 5 employees in your company and hire freelancers)
6. Highest educational Qualification
7. Period of freelancing
    - Less than 1 year
    - 1 to 2 years
    - More than 2 years
8. What were types of jobs handled most frequently?
    - Website & software development
    - Hardware support
    - Writing
    - Design
    - Data entry
    - Entertainment
    - Teaching
    - Gambling
    - Sales & Marketing
    - Product sourcing & Manufacturing

- Accounting & Legal
- Survey
- PTC (Paid to click)
- Other

9. What was the freelance market you mostly worked?
    - Upwork
    - Topal
    - Freelancer
    - Craigslist
    - Guru
    - 99designs
    - Peopleperhour
    - Freelance Writing Gigs
    - Demand Media
    - College Recruiter
    - GetACoder
    - iFreelance
    - Project4hire
    - SimplyHired
    - Cilxsense
    - Traffic Monsoon
    - Ojooo Wad
    - LittleBux
    - Other
10. Did you stop freelancing permanently?
    - Yes
    - No

Section B (Questions Related to Obstacles)

Please mark an “X” in the most appropriate answer.

Q1. I feel isolated and insecure in the freelance market since I don't have the experience, knowledge or infrastructure to do the job efficiently.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q2. I'm suffering from work-related health issues since I have no time to meet the doctor or to do physical exercises.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q3. Overseas clients are counting on Sri Lankans to deliver quality 24X7 service on time for fewer rates than Indian & Chinese freelancers.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q4. Valuing and negotiating prices are the most complex parts of freelancing. Since I don’t have good reputation. Nonpayment risk is high.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q5. I do not get incentives, grants and bonuses for reaching targets.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q6. I received much contradictory feedback since the first project not being performed skillfully.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q7. I spend many hours working alone.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q8. I do lots of parallel projects but my clients underrate me since my working quality is bad.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q9. Freelancer is the sole person responsible for finding all their own clients and projects.

- Strongly Agree
- Agree
- Undecided
- Disagree

- Strongly Disagree

Q10. It is more important to attend family matters than to get involved in freelancing.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q11. I'm not satisfied since freelancing is discouraged by lack of social recognition.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q12. Large swings in income can make budgeting difficult.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q13. Freelancing should be used as a stepping stone only. Resigning from a stable job and jump directly toward freelancing is a significant mistake.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Q14. I don't want to do it since there is no assistance from authorities.

- Strongly Agree
- Agree
- Undecided
- Disagree

- Strongly Disagree

Q15. What do you suggest for betterment of Sri Lankan IT freelancers?