CRITICAL SUCCESS FACTORS FOR TECH START-UPS IN SRI LANKA

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DECLERATION

I declare that this is my own work and this thesis/dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any University or other institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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10/03/2016

I have supervised and accepted this thesis/dissertation for the award of the degree.

Dr. H. M. N. Dilum Bandara

10/03/2016

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ABSTRACT

Majority of the tech start-ups fail to establish themselves and become successful. This is not just in relation to the Sri Lankan start-ups but a common problem faced globally. While most of the start-ups fail, some start-ups manage to establish themselves and become successful. Even among them, only a very few start-ups go on to become extremely successful. While success of these start-ups can be attributed to many factors, it is imperative to understand the specific/key success factors particularly in the Sri Lankan tech start-up context. As we see a rapid increase in the number of Sri Lanka tech start-ups, understanding of such factors could help the budding start-ups to align their strategy to benefit from critical success factors while avoiding some of the pitfalls.

This study attempts to establish the most critical factors that affected the success of tech start-ups. These factors are identified by studying the start-ups that are now established in the industry. Gaining understanding on what paths were taken as a start-up and what paths to be avoided is the main focus.

The methodology employed for the study was a series of interviews with industry leaders who founded start-ups and was an eventual success in the industry. A case-by-case account of each of these individuals was used to create the model which this study attempts to design. Grounded theory was employed to analyses the data that was gathered. Findings showed that industry experience, communication, passion, planning, innovation, R&D expenditure, market scope, brand, recognition, credibility, networking, financial resources and IT workforce are among the critical success factors for tech start-ups in Sri Lanka.

Keywords: Critical Success factors, Entrepreneurship, Tech start-ups.

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ABBREVATIONS

BPM	Business Process Management
BPO	Business Process Outsourcing
GDP	Gross Domestic Product
HR	Human Resources
ICT	Information and Communication Technology
IP	Intellectual Property
IQ	Interaction Quality
IT	Information Technology
POS	Point Of Sales
R&D	Research and Development
SMB	Small and Medium sized Businesses
UBI	University Business Incubators
VC	Venture Capitalists

1. INTRODUCTION

Entrepreneurs in tech can be named the visionaries of the modern times. Innovation that drives today's society has been formed through the excellence of these visionaries. Tech start-ups have been on the rise since the Internet boom of the 2000s and ever since new start-ups have emerged to provide innovative products and services that were non-existent a decade ago. These start-ups which go on to become successful in the IT industry are now the major players in the ICT domain. The success stories of successful start-ups such as Facebook, airbnb and Uber are inspiring and with the resources for this kind of start-ups becoming increasingly available, aspiring entrepreneurs emerge.

While creating the next big start-up is the dream of every aspiring entrepreneur, there are its downfalls. Not all start-ups survive to become successful. Most of the start-ups fail in their attempt due to many reasons such as lack of funding, leadership and intense competition (Griffith, 2014). There still remains that some do succeed and go on to the global stage. Sri Lankan entrepreneurial landscape is not that different from the global context where start-ups do fail and some go on to become a success story. The study focuses on the problems faced by these new technology ventures, while concentrating on the Sri Lankan entrepreneurial context.

1.1. Research Background

Sri Lankan Software Development Industry has grown rapidly over the last decade (Sri Lankan IT/BPM Industry 2014 Review, 2014). Numerous small to medium sized start-ups have emerged during the said time but only a few have survived. These start-ups range from delivering services such as Enterprise Applications, medium to small scale applications such as POS (Point-of-Sales) Systems to Web applications. With the increasing demand for performance, usability and data analysis software

industry is a gold mine for potential start-ups who want to build themselves as the next Bill Gates or Steve Jobs.

Sri Lanka boasts of stories of new technology ventures that have succeeded to become global competitors with renowned tech giants in the world. While there stories are inspiring what is required from a Sri Lankan entrepreneurs perspective is how to replicate that success in building a technological venture that is similar or better. Sri Lanka is no "Silicone Valley" boasting with resources required by entrepreneurs to kick-start their idea. But, in the recent past resources have grown; people are interested and ready to take the leap. Technology is an ever changing, dynamic tool which is the main reason that any individual with the desire to start a start-up can become successful. Innovation is considered a key ingredient in the technological space where if properly handled would open up new markets, opportunities and even new technological domains. Sri Lankan software industry can be divided into two main categories, Product-based companies and Project-based companies. Software development companies thrive to innovate, as that is the only way to keep up with the current industry trends. Although there are no statistics on ventures that have failed in their endeavors, it is understood that most new technology ventures do not make it to its first year of operation due to many varied reasons (Damodaran, 2009). Given the high rate of failure with such ventures, it would be beneficial for future entrepreneurs to know what the main cause for failure was and what steps to take to make it a success.

1.2. Problem Statement

Software start-ups historically have a high failure rate. Nevertheless, Sri Lanka has recently produced some exceptional tech ventures. Therefore, the problem that this research attempts to address is:

What are the critical factors for success and failure of tech start-ups in Sri Lanka?

A clear understanding of such critical factors will help aspiring entrepreneurs to build successful technology ventures that can replicate predecessors in the industry. Given the high rate of failure in start-ups, it is imperative to identify the factors which could lead to the eventual success or failure.

There are numerous studies that focus on the success factors of tech start-ups. However, they do not offer much insight on the Sri Lankan context. Although the studies can be comprehensive there were no studies focusing on the Sri Lankan markets. Silicon Valley in the United States of America is considered the technological hub of the world. Some of the well known start-ups operate from that location. But, Colombo is not Silicone Valley. The differences in social, cultural and economic environments between these places cannot be taken for granted. The cultures of relatively poor countries such as Sri Lanka can be characterized by large power distance and low individualism and often by strong uncertainty avoidance, at least in Western countries. This in conjunction with relatively high dissatisfaction with society and life give rise to a high incidence of small-scale self-employment (Hofstede et al., 2004). Furthermore, findings suggest three main disabling economic factors for potential entrepreneurs in Sri Lanka include a) lack of access to finance, b) lack of access to business support, and c) the outdated policy and regulatory environment. Most young entrepreneurs lack the collateral required for obtaining bank financing, and the Sri Lankan culture assigns great value to being debt free, which discourages them from seeking loans (Weeratunge, 2010).

Within this problem domain following are the specific research problem areas that will be addressed in this research:

- What are the most critical factors that will affect the new technology ventures (tech start-ups) in Sri Lanka?
- How would those factors affect the success or failure of a start-up?

- Can the study create a model for Technopreneurs to get taken up on building a software development company by focusing on the success factors and avoiding failure?

1.3. Research Objectives

Following are the objectives that this research strives to achieve:

- Identify the critical success factors affecting new technology start-ups.

  The study will emphasize on the data which will be gathered through interviews with success stories of the Sri Lankan IT industry. With this and information uncovered through the literature review, map out the most critical factors that shaped the industry as it is today.

- Formulate a model to successfully start a new technology venture.

  With the factors identified which resulted in a successful tech start-up, the study strives to create a functional model which can be verified with other successful start-ups.

1.4. Outline

Rest of the thesis is organized as follows. Chapter 2 presents a detailed account of the literature that was reviewed to find the current status of available literature. With these findings Chapter 3 presents a hypothetical model of factors contributing to the success of a tech start-up. Data analysis is presented in Chapter 4. Chapter 5 discusses the conclusion and future work related to the study.

2. LITERATURE REVIEW

In this chapter the discussion will evolve around the related literature on Sri Lankan software industry understanding on what a software start-up and how to define success of a software start-up. Moreover, success factors identified from the related work is also presented. Section 2.2 attempts to define what a start-up is while Section 2.3 attempts to create a method of measuring success. Section 2.3 evaluates related work that is available to get a better understanding on the success factors for tech start-ups. Section 2.4 focuses on the current literature that is available on the factors identified through this study.

2.1. Sri Lankan Software Industry

The software industry in Sri Lanka as in many other countries can be described as the development, maintenance and publishing of software using different business models. Furthermore, the industry includes services such as training, documentation and consulting. While the industry, mainly consists of IT services and Business Process Management (BPM) the top three markets served have been Europe (UK and Ireland), US and South Asia (Sri Lankan IT/BPM Industry 2014 Review, 2014). Moreover, the Asia-Pacific region has shown faster growth than mature markets whilst the industry makes a significant market presence in Australia/New Zealand, mature Asian markets and the Middle East (Sri Lankan IT/BPM Industry 2014 Review, 2014).

Statistics show that Sri Lankan GDP as in 2013 is LKR 8,673,870 million where the services sector contributes 56.8%, which amounts to LKR 4,925,166 million (Department of Census and Statistics, 2013). The Sri Lankan software industry alone contributes less than 1.07% to the national GDP with a relatively low the total contribution of LKR 93,600 million. The industry contribution is divided between IT

Services with 77.5% and BPM with 22.5%. The exact numbers are still unknown as most of the companies are still privately owned or information is not publicly available (Sri Lankan IT/BPM Industry 2014 Review, 2014).

IT and Services has a firm hold of the total GDP of the software industry. The industry has grown rapidly in the last decade as more and more start-ups keep emerging. Sri Lankan IT workforce has also grown significantly within the last decade from 15,586 in 2003 to 75,107 in 2013 to show 482% growth in the given time. The ICT workforce on the same time-line has seen an increase from 7,625 in 2003 to 30,661 in 2013 which is an increase of 402% (National ICT Workforce Survey, 2014). Clearly the Sri Lankan software industry is growing and start-ups will emerge as demand is increasing. When the industry grows, so does the opportunities for entrepreneurs to build start-ups to cater that demand. This high demand will see emergence of new start-ups creating opportunities for the IT workforce.

2.2. Software Start-ups

Start-ups can be characterized as small, unincorporated, solo, first-time, or home-office-based, and are more likely to be financed by self, family and friends. Experienced Entrepreneurs are more likely to be financed by external sources (Mann and Sanyal, 2010). One such classification of Entrepreneurial start-ups that meet a certain criteria is defined as firms that satisfy one of the following conditions (Praag and Versloot, 2007):

1. They employ fewer than 100 employees
2. They are younger than 7 years old
3. They are new entrants into the market.
4. The control group is formed by employees

However, as the focus of this research will be on “Tech Start-ups” where the definition of “Tech” being software development companies in Sri Lanka and “Start-

up" definition should be defined with respect to the current Sri Lankan software industry.

One related definition is "software companies found within a given period that has at least one completed local project" (Jayasena and Nanayakkara, 2012). Average level of assets, number of employees, number of operational owners, profits, revenue, wages paid to employees, and rate of business closure (Lowrey, 2009) are several other characteristics of a start-up. Ultimately the definition can be derived from adding the output of the start-up being technology based.

2.3. Success of a Software Start-up

The Success of a venture can be defined or measured in many forms. The above discussion on what a "Tech Start-up" gives an indication of which areas to look at to determine if a start-up is successful. Song et al. (2008) determined supply chain integration, market scope, age of the firm, the size of the founding team, financial resources, marketing experience, industry experience, and patent protection as the factors contributing to the success of a tech start-up. While this alone cannot be taken as the definition of success, these variables can be derived to measure success of a tech start-up with respect to the Sri Lankan context. This is no easy task as the research available with respect to the Sri Lankan software industry is limited. Success should be defined in such a manner that it gives credibility to the participating firms and establish a measurable variable for this research and for the company reputation.

Defining success of a start-up should be done after extensive review, which will be the main focus of this study. Determining if a start-up is successful and what are the means or methods used to be successful were defined in this study.

2.4. Factors Affecting Successful Software Start-ups

Entrepreneurship is not an easy task and takes effort to get things moving. Firm founders do not instantaneously establish new firms, but create them through a series of actions such as obtaining inputs, conducting product development, hiring employees, seeking funds and gathering information from customers. These actions are undertaken to different degrees, in different order, and in different points in time, by different firm founders (Gartner, 1985). This process is further assisted by external factors that directly or indirectly affect a firm. Helping bodies (venture capitalists, angel investors), IT workforce, infrastructure, stability of government and national vision were found as external factors affecting the growth of software start-ups in Sri Lanka (Jayasena and Nanayakkara, 2012). With these internal and external factors combined it is crucial to know the steps to take when starting a new venture.

2.4.1. Founding Team

Founders of a start-up play the most crucial role in the early stages of the company. Various studies concluded that founder or founding team as a major factor in a start-up success (Shane and Venkataraman, 2000). There needs to be a founder, an entrepreneur, in-order for a company to be initiated. There can be instances where an established organization creates a company which can also be called a start-up. But, within this study the main focus will be on start-ups that are been established from the ground up. While entrepreneurial opportunities are abundant in the tech industry, discovering these opportunities and exploiting them is *entrepreneurship* (Shane and Venkataraman, 2000).

Industry Experience

There are many factors which evolve around the founding team that affect the eventual success of a new technology venture. Research has revealed many factors

that have great importance for new venture success (Song et al., 2008). Industry experience is an important part when building a successful business. It was found that having extensive industry experience within the founding team had a positive impact in successfully starting new technology ventures (Song et al., 2008). There is a direct link between the industry experience of the founding team and venture performance. When considering small, technology-based new ventures the founding teams' industry experience appeared to be the most important determinant for success. Hence, it is observed that the fit between strategy and team experience is a key determinant of the long-term success of high-tech entrepreneurial ventures (Shrader and Siegel, 2007). Transferring experience in the industry and technology cannot be done easily. While in the start-up phase a venture may not have the required financial resources to hire staff of specialists necessary to help learn the unique aspects of a new venture. A new venture will be relatively resource constrained at the early stages. Therefore, having the expertise within the founding team would be imperative (McDougall et al., 2003). While the studies do show that industry experiences of the founders were found to be having a significant positive impact on start-up success, there is not much to predict on the chances of success for nascent entrepreneurs with high degrees of experience. Among nascent entrepreneurs with limited experience, there is more variation that can be explained by the characteristics distinguished. Interestingly, making use of information and guidance increases the chances of success among less experienced business founders. People with experience in setting up a business, but who have relatively little experienced otherwise also have an advantage (Gelderen et al., 2005). Industry experience of the founding members may influence the innovation rate of the firm and the level of innovation will depend on whether all the founding members entered the industry around the same time period or during different time periods (Ruef, 2002).

Marketing Experience

Experience in marketing activities of the founding team can have a major effect on the eventual success or failure of new technology venture. Marketing experience is essential when building a successful business. It was found that having exposure to marketing activities within the founding team had a positive impact in successfully starting new technology ventures (Song et al., 2008).

Experience in the marketing domain was one of the most important factors in successful internationalization of new ventures. Marketing expertise was considered one of the greatest obstacles to internationalization of small firms. Therefore, it is assumed that managers with stronger marketing skills will tend to build a successful venture and find it easier to adapt the skills that they already have as needed for international markets (McDougall, 2003). Having prior experience has seen as a positive to gain growth in the industry and become successful. While this does not mean all start-ups will fail without experience, it does indicate a slow growth rate of the venture (Friar and Meyer, 2003).

Prior Start-up Experience

Failures can teach in a way that success cannot. Having prior start-up experience can be beneficial to avoid such failures. While this does not mean all the successful entrepreneurs failed at some point history shows most of them have failed at their first attempt. Entrepreneurial expertise in start-up growth and business development is a must. What is encouraged is to bring together the best minds called for by the venture, as early in the planning stages as possible. Gathering experienced support that is specific to the product, technologies, markets and channels is essential. Nothing will save as much time and error, nor speed success like applying human capital to the venture from the earliest planning stages. Most new ventures will benefit by having access to expertise in entrepreneurial ventures as well as to expertise in venture-specific (Tamer, 2005).

Entrepreneurs learn and profit from prior start-up experience. He found that entrepreneurs with prior start-up experience tended to perform better in terms of sales and profits than did entrepreneurs in their first business. It is relatively easier to start a company the second time; both in terms of making decisions, and in knowing what was involved in launching a firm. Perhaps more than any other type of work experience, prior start-up experience can help compensate for the liabilities of newness. Therefore, it is assumed that the more experience the top management members have had with prior start-ups, the more likely to succeeded (McDougall et al., 2003).

Communication

Communication between the founding team is essential when growing a new technology venture. Interaction Quality (IQ) of the founders in new software ventures has considerable and highly significant effects on customer orientation and competitor orientation. Which good communication, task coordination, mutual support and sharing the right information among each other in turn has shown successful marketing management. It was assumed that IQ to be an important antecedent for the fulfillment of other tasks in new software venture management, such as product development, procurement and distribution (Mueller and Gemünden, 2009).

2.4.2. Innovation and R&D

Innovation and Research & Development (R&D) impact the ventures performance from a start-up all the way to becoming a success. Especially in new technology ventures innovativeness is the key to survival and in the long run it becomes the key aspect that differentiates the competition from the business. Innovativeness within the venture produces innovative products and R&D becomes a huge part in making innovation a success.

Innovativeness

Innovation in the tech industry can come from two means of ventures such as newly established ventures (start-ups) and large, well established, larger, more resource-endowed ventures (Bayus and Agarwal, 2007). Technological domain is an ever evolving area where innovation happens at each passing moment. So, greater breadth and speed of technological learning is expected to enhance a new venture's performance (Zahra et al., 2000). Innovativeness can increase the likelihood of survival. Enhancing the start-ups' market power, reduce the costs of production and allows the creation of dynamic capabilities and absorptive capacity. Younger firms may benefit immensely from the opportunities created by innovativeness due to their less rigid routines and greater flexibility (Hyytinen et al., 2015). Entering a new industry new technology ventures should concentrate and understand their ultimate performance. Thus, observing that start-ups should drive innovation to survive in the technological industry (Bayus and Agarwal, 2007). Without technological learning, the firm's skills become outdated, its products become obsolete, and its future gets uncertain. Technological learning provides a base of knowledge upon which innovations can be developed. An important criterion for the development of innovation is the possession of adequate knowledge. Depth and speed of the venture's technological learning can create and market innovation more quickly, thereby gaining competitive advantage, even over larger, more resource-endowed firms, ensuring venture survival (Zahra et al., 2000).

On a negative note an innovative start-up is laden with excess liability of novelty and smallness, which reduce its chances of survival relative to its non-innovative counterparts. Start-ups' innovativeness may also limit their access to external finance (due to lack of collateral) and change their overall risk profile by making the distribution of revenue streams more variable and skewed and by delaying them in time. Taken in context, the effect of entrepreneurial risk-taking is task dependent and

matters in particular for innovativeness (Hyytinen et al., 2015). The above mentioned large, diversified ventures are more likely to adopt new technology standards while entrepreneurial start-ups fail. They enjoy higher survival rates in the early years of this new industry. For later entrants, however, start-ups are more likely than diversifying entrants to expand their product line to include the newest technology, and thus they tend to have higher survival rates in the later years (Bayus and Agarwal, 2007).

While entering a new industry, new technology ventures should concentrate and understand their ultimate performance. Thus, observing that start-ups should drive innovation to survive in the technological industry (Bayus and Agarwal, 2007).

Research and Development Investment

R&D investments are essential for any organization to develop innovative products. On a high technology environment investors clearly value investments in R&D. Within a research-intensive environment such as the technology domain, a narrow strategic focus on the development of product by a new venture results in the creation entrepreneurial wealth (Deeds, 2001). Start-up firms in R&D-intensive industries face a higher cost of capital than their larger competitors and firms in other industries (Hall and Lerner, 2010).

Operating businesses use R&D to improve actual earnings while start-ups use R&D to improve prospective earnings. When the start-up entrepreneur commercializes their new product, device, or service with conventional investment, prospective earnings convert to actual earnings. R&D's appeal for start-ups is not obvious because the same R&D after commercialization improves actual rather than prospective earnings. However, the start-up entrepreneur exploits R&D's knowledge creation with commercialization only if R&D's impact on prospective earnings is significant and otherwise not. These R& D costs are considered sunk costs for the operating business, but avoidable for the new venture start-up. The R&D option is,

therefore, more valuable for the start-up. Commercialization costs delay commercialization of a new venture until profitability is great. Delayed commercialization reduces the appeal of R&D to the new venture entrepreneur (who bears R&D costs without revenue prior to commercialization) relative to managers of already operating businesses (Blazenko et al., 2012). A firm's capacity to the value of R&D creates appropriable benefits by increasing the productivity of the firm's R&D investments. Continually absorbing information from beyond the boundaries of the firm allows it to continually re-evaluate its portfolio of R&D projects based on the new information. With this information affirm can adjust its portfolio of R&D projects to minimize the odds of failure by avoiding repetition of the failures and the dead ends of competitors and other research organizations in the field, and by speeding up the firm's ability to recognize unprofitable avenues of exploration. Therefore, the ability to value R&D of the firm increases the return on its R&D while emphasizing the importance of R&D Investment (Deeds, 2001).

R&D investment can help overcome the (information) sunk costs of entering export markets. Investing in R&D is essential for new technology ventures to guarantee high success rates. When considering export market for technology, having strong internal R&D positively supports export markets. But, this does not mean the export of intensity of the firm will increase (Ganotakis and Love, 2011).

2.4.3. Industry and Market

Industry and market of the new venture is considered a major factor when establishing a successful business. Global as well as local industry contributes to the eventual success or failure of the venture. Tech industry is an evolving industry where change is happening daily. While the industry dynamics affect most of the tech ventures the market those venture serve can differ with respect to the clients they serve. Within this context there are many factors to consider.

Competition Intensity and Competitor Orientation

Competition intensity refers to rivalry among competitors in an industry to the extent to which firms within an industry put pressure on one another and limit each other's profit potential. If rivalry is fierce, competitors are trying to steal profit and market share from one another. Competition is dynamic and rests on innovation and the search for strategic differences (Porter, 2000). *Competitor orientations* refer to constantly reassessing its strengths and weaknesses of the venture relative to its competitors.

Technology ventures require resources (e.g., financial and infrastructure) to sustain its operations to its eventual success. Competitor orientation to change in the market has shown significant correlation with the profit a venture generates (Slater and Narver, 2000) with which ventures can invest in these resources. New products enjoy a unique competitive position because it is radical, departs from the statuesque, and is proactive, unconventional, and unpredictable. This means ventures new and established should challenge this new product and its competition. Even though new technology ventures are at a disadvantage with lack of resources increased competition will mean innovation leading to new product development. This can be seen as a threat as well as an opportunity (Atuahene-Gima et al., 2006).

While new products do increase intensity in competition, competitive environments and product innovation was positively related with financial performance. It appears that when new ventures emphasize product innovation, the negative effect of competition intensity on new venture performance will be mitigated (Li, 2001).

Market Scope

Enlarging market scope provides new ventures competitive advantage and results in higher profit margin. Moreover, in many markets, products incorporate an increasing number of technologies to provide more functions to satisfy customers (Chen, 2009).

Market information is essential for a new venture performance and survival. Having a formal process of gathering market information is essential for a start-up as well as established ventures. In emerging markets, the use of formal processes for collecting market information has a direct, positive and significant relationship with new venture performance (Song et al., 2010).

Market oriented firms are innovative in their marketing strategies. Marketing team should consider not only facilitating top management team social capital but also its deployment in the appropriate environmental conditions. Forging external relationships and finding the appropriate technology and market conditions conducive to market is therefore a key challenge for managers of new ventures in allocating resources (Atuahene-Gima et al., 2006). Drawing upon the expansion of the market scopes both technological and market knowledge is vital in influencing speed of expansion. Technological knowledge could lead to technological breakthrough, optimal product design, and rapid response to competitive pressure and is an enabling resource for expanding the market scope on a global scale. Market knowledge leads to awareness of client problems, a more accurate valuation of the market potential of new technologies, and access to innovative ideas from lead users or key clients (Prashantham and Young, 2011).

Marketing Intensity

Industry growth which has direct impact on the success of the venture is affected by marketing differentiation. Market differentiation has shown to directly affect a firm's financial and market performance. It was observed that although new ventures may adopt various strategies in response to different environmental conditions, product innovation and marketing differentiation strategies are two major ways for new ventures to effectively exploit industry opportunities (Li, 2001).

New ventures are entering international markets early in their life cycle. There seem to be a strong relationship between international diversity and mode of market entry

and the breadth, depth, and speed of a new venture firm's technological learning, especially when the firm undertakes formal knowledge integration. In turn, the breadth, depth, and speed of technological learning are related to new venture firm performance. International diversity and mode of international entry are also positively related to new venture performance (Zahra et al., 2000).

Marketing alliance are consistent with the strategic position view of alliance which suggests that alliances may help new ventures to defend their vulnerable market positions through acquiring more resources in a hostile environment. The results also support the view that new ventures with broad strategy are more likely to be successful (Li, 2001).

Customer Orientation

Technology ventures should serve, shape and create their environments resulting in growth through innovations and products that meet both current customer needs and create new opportunities. They have a higher learning capability. Thus, the result may be interpreted to support our theoretical reasoning that learning capability enables companies to apply several orientations simultaneously. Assuming that learning capability is one of the distinguishing factors of more capable entrepreneurs; results support that these ventures of several orientations operate faster growing businesses (Hakala and Kohtamäk, 2011).

Technology venture founders should consider to which degree they want to implement customer orientation in their company. Results indicate to maximize customer orientation – or leave it out. In either case a ‘‘stuck in the middle’’-situation should be avoided, as it leads to low levels of venture performance (Mueller and Gemünden, 2009).

2.4.4. Resources

Resources are an integral part of any organization. Technology ventures as any other venture need resources to survive in the industry. These resources can come in many forms that directly and indirectly affect the performance of the venture. When the start-up is developing at very high speed, it needs to acquire sufficient resources (e.g., capital and talents) to build solid infrastructure to support its growth (Fu, 2014). Resources are considered a major factor in new venture survival (Song et al., 2008). Numerous studies have identified the importance of financial resources for businesses. The financial sector can represent an important obstacle for entrepreneurial activity. Inaccessibility to financial support in the form of loans is an impediment for the entrepreneur (Soriano, 2010). In order to mitigate the lack of resources, start-ups often appear to take advantage of open source solutions when possible (Giardino et al., 2014).

Financial Resources

Any successful venture requires access to capital sources and an effective strategy for its use. Beyond this, experience is required to manage intellectual property, attract experts, form successful alliances and, most critically, control the capital strategy and valuation at all stages of the ventures development. Capital can be obtained by:

- Staying “self-funded”, rather than accepting other sources of capital.
- Accepting debt to preserve equity. It helps to know when revenues or corporate cash will be available to offset the debt.
- Accepting only non-equity strategic capital. This refers to intellectual property (IP), human expertise or co-marketing in the early stages. Often times this non-equity capital has cash value for the IP, the expertise, or the marketing access.

- Accepting outside equity. This occurs only at later stages (when the investment "costs less" in equity) and when the outside investors bring more than funding (e.g., access to expertise or new markets, and/or synergies with other companies in their portfolios).

Launching a product or service into the marketplace and creating initial revenue raise the ventures valuation. The growth of the venture continues to increase its valuation, attracting more strategic partners and investors to support its expansion (Tamer, 2005). Furthermore, financial support for these ventures can come in the form of bank loans, private loans, family loans (i.e., borrowing from the family), investment of own capital (Soriano, 2010), venture capitalists (Bertoni et al., 2011) and Angel investors/funds (Jayasena and Nanayakkara, 2012).

The model shown in Table 2.1 by (Fu, 2014) was incorporated to match the financial requirement of a new technology venture to survive and ultimately become successful. When taking this model into the context of start-up existence, survival and what it takes to succeed in these stages are important.

Table 2.1 - Stages of growth and financial requirement.

Stage	Characteristics	Challenges
Existence	- Focus on obtaining customers. - Deliver the product/service contracted for.	Have enough money to cover cash demands of start-up phase.
Survival	Satisfy a number of customers sufficiently with its product/service to keep them.	- Generate enough cash to break-even. - Generate enough cash to finance growth.
Success	Attain true economic health, sufficient size and product market penetration to ensure economic success, and earn average or above average profits.	- Decision to use company platform to growth. - Avoid cash drains in prosperous period.

Financing the venture has become one of the critical factors of the success. New technology ventures only tend to opt for external funding when personal funding is

exhausted. Majority of the technology-based ventures will consider external funding such as bank loans as the last resort (Colombo and Grilli, 2007Revest; Revest and Sapio, 2012). While personal financing and external loans to finance start-ups are acceptable for venture growth, Venture Capitals (VCs) investment shows a high effect on growth for new technology ventures with growth in sales and employment contributing to the growth of the venture. Therefore, VC funding has become a major factor of success in unfavorable economic environments where quick growth is required to succeed in the industry (Bertoni et al., 2011).

The presence of angels among early-stage financiers of new technology-based firms should improve the chances of eventual venture capital financing. Firms with private investment would have easier access to venture capital as investments can be obtained through other private investors (Madill et al., 2005). According to Madill et al. (2005) 57% of the firms that had received private investor financing had also received financing from institutional venture capitalists, while only 10% of firms that had not received angel financing obtained venture capital. Angel investor financing was a significant explanatory variable (among others) of differences between venture capital recipients and firms that had not received venture capital. It would appear that angels help firms to become more ready for future stages of investment by, among other contributions, being closely involved with the firms in which they invest. They usually provide advice and networking opportunities. They also serve on Boards of Directors and Advisor's, and provide hands-on assistance and business intelligence. Angels also fulfill an important accreditation role. Overall, involvement of angels can substantially increase the attractiveness of firms to institutional venture capitalists (Madill et al., 2005).

IT Workforce

Having a talented IT workforce is essential to any organization and having skilled employees in a technological venture is paramount to its success (Jennex et al.,

2004). It is important to be able to call upon highly educated workforce and a tradition of higher education, especially engineering education. The status of engineering is boosted by the presence of major global players in other high-tech industries, in particular, companies providing services to recognized markets (Barr and Tessler, 1999). Strict labor laws and unavailability of skilled technological workforce have made the workforce critical factor for the success of a new technology venture. Software companies find it difficult to recruit the employees with necessary skill set due to the scarcity of the IT workforce (Jayasena and Nanayakkara, 2012). Discussion on IT workforce can evolve into many forms and characteristics. The strength of a nation's workforce stems from a multi-generational tradition of science and engineering that has strong roots in universities, polytechnics and vocational schools. Qualities of the workforce, English language and managerial skills have proven essential to strengthen the industry and start-ups to survive (Carmel, 2003).

Technology domain in Sri Lanka is not limited to Research & Development centers for software development. Business Process Outsourcing (BPO) has emerged in the last decade following the footsteps of India. Asia is booming with knowledge workers and harvesting this is done through the outsourcing the technological ventures down to these countries. The elite of the offshore labor pool, the talent that is now being directed at higher-end software activities was always there. But, not long ago, this talent would migrate to the industrialized nations or find other jobs. But now, with the emergence of outsourcing talent is essential. Having such talent is paramount to the successful of these ventures (Carmel and Tjia, 2005).

R&D Alliances

R&D alliances can be seen as a threat to many organizations which are in the same industry. Sharing technologically important knowledge with its competition seems quite unheard of. Studies done on this area with respect for new venture growth

shows very different approaches. In inter-industry relationships, firms were found to be more ready to share ideas and exchange information as they did not view each other as rivals, making homophile less of an issue at the organizational layer. Learning is a path-dependent process, where the acquisition of further knowledge is dependent on existing knowledge of the same kind, with knowledge growing by increasing specialization. There are benefits for technology start-up firms from "learning-by-interacting". These benefits include exposure to new markets, endorsements from industry leaders and access to complementary resources to develop innovative solutions that could not have been developed alone. Young technology ventures, value-creation through rapid new product development is critical to gain access to early cash-flows and increase the odds of survival. Owing to the increasing costs of new product development, asymmetric alliances of this type are likely to be particularly beneficial to young, resource-constrained firms, since alliances with industry leaders enable firms to gain faster access to resources and build credibility. Alliance inception, joint-learning and specialization leading to discovery of new knowledge can and will be essential for new technology ventures (Perez et al., 2013). Figure 2.1 illustrates this clearly.

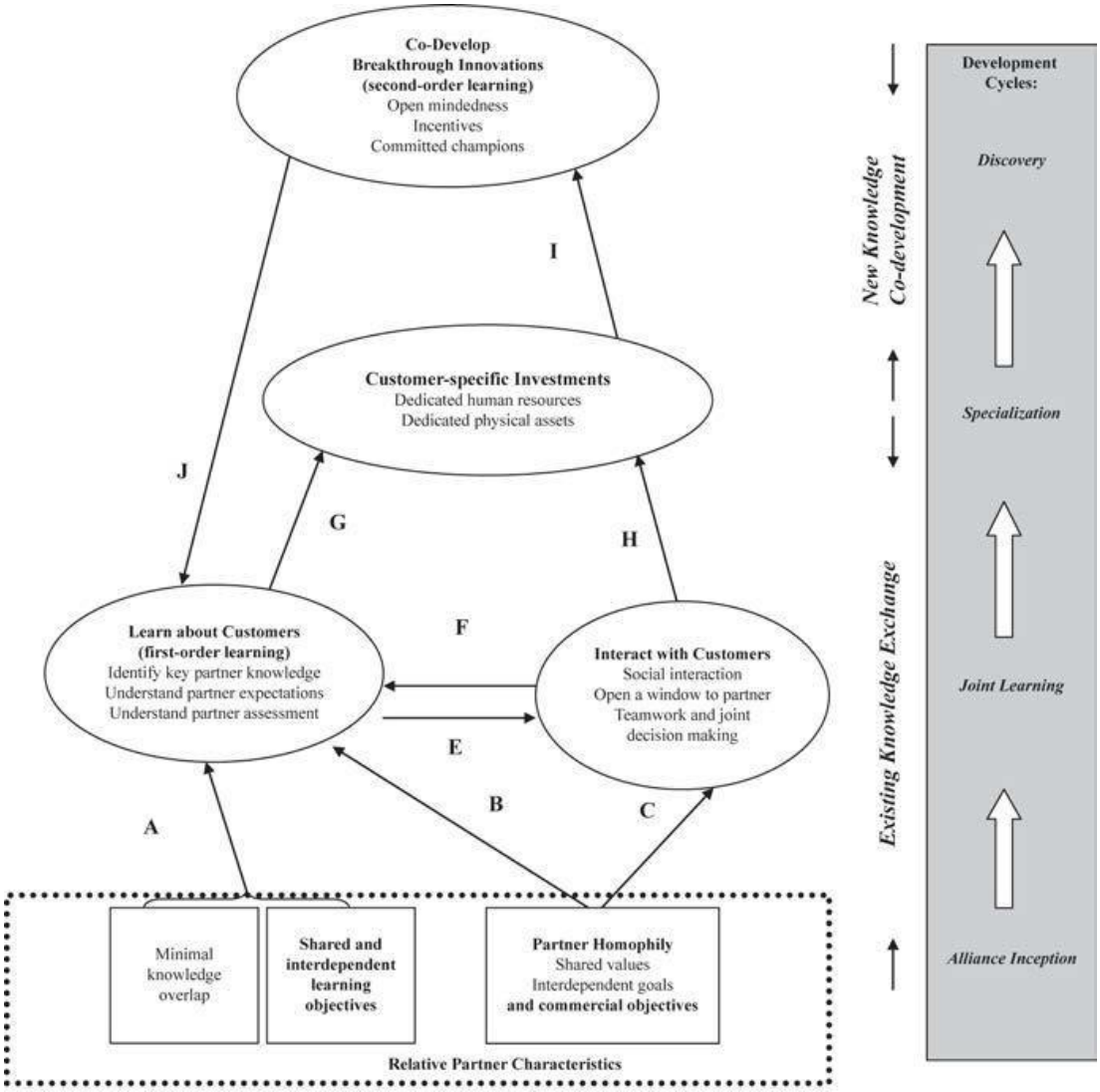

Figure 2.1 - Alliance formation, learning and specialization (Source: Perez et al., 2013).

Strategic alliances can leverage the success of a new venture. External alliances provide ready-made market reach and access and rapidly create early revenue. These are win-win alliances, including capital partners, channel partners, licensing partners, co-marketing and co-development partners. It is important to understand who will benefit from an alliance, as well as have the ability to support it. Gather the support while the venture is in its early formation stage. Offer concrete advantages and make direct requests for support (Tamer, 2005).

Mentors

Mentors take up a massive part of the start-up experience by providing advice and guidance for the entrepreneur. Knowledge management, while being an essential part of the start-up can be achieved through having mentors. They usually provide advice and networking opportunities. They sometimes serve on Boards of Directors and Advisor's, and provide hands-on assistance and business intelligence. Mentors also fulfill an important accreditation role. Overall, involvement of mentors in an advisory role can substantially increase the attractiveness of firms to institutional venture capitalists or potential partners (Madill et al., 2005).

Various types of knowledge are needed in different phases of the new venture life cycle is important for practitioners seeking growth. In the early days of the new ICT venture, it would seem important for a firm to develop its knowledge-management strategy so as to be able to replicate its assets and enjoy economies of scale, which in turn would foster growth (Saarenketo et al., 2009).

University Partnerships and Incubators

University partnerships with new technological ventures can be fruitful. Employment for its graduates as well as providing industrial experience are beneficial for both the parties while steady source of IT resources such as technology, workforce and even

advice are essential. Partnerships with local universities were considered as a factor for venture survival (Song et al., 2008). With industry-university partnership programs quality of the proposals and the excellence of the work quickly established the value of the concept (Atkinson and Pelfrey, 2010). There has been a rapid increase in technology commercialization at universities. Universities are now in the business of managing intellectual property portfolios and are often aggressively attempting to commercialize discoveries from their laboratories (Phan and Siegel, 2006).

Technology Incubators differed from the existing industrial parks and estates, as the focus shifted away from real-estate development and subsidized rents to value-added business services (O'Neal, 2005). There is a very efficient means of technology transfer and research commercialization through young start-up companies, using University Business Incubators (UBI). Study of UBIs has brought useful insights on the factors that influence the successful technology transfer of universities to young and small firms. Young firms that have a choice should look for the incubator with the strongest set of such academic relationships. Young firms thinking about joining a UBI should also consider the number and kind of professional services which an UBI offers. Both directly and via its network, the UBI also provides its firms with critical resources, such as seed financing and human capital. The growth of firms in a UBI will also be positively influenced by the level of entrance criteria of the UBI. There is a valuable impact from the related university to the start-ups via the UBI. Representatives of the university can serve as a member of the advisory board of the UBI (Lendner, 2007).

Patent Protection

Intellectual Property (IP) rights in the software industry are controversial. Patents can affect technical change, industry dynamics, and ultimately welfare, is through their role in stimulating or stifling entry by new ventures. Patents can block entry, or raise

entrants' costs in variety of ways, while at the same time they may stimulate entry by improving the bargaining position of entrant's vis-à-vis incumbents, and supporting a "market for technology," which enables new ventures to license their way into the market, or realize value through other forms of trade in their intangible assets. Patents significantly affect the likelihood of obtaining funding for early-stage firms. Firms in "thicketed" markets with a large number of patents are less likely to receive funding from outside investors at both early and late stages in the entrepreneurial process compared to those in markets with fewer patents. Firms that have higher numbers of their own patents are more likely to receive funding from outside investors, and more likely to subsequently "exit" from the entrepreneurial phase through IPO or acquisition (Cockburn and MacGarvie, 2009).

Most technology ventures develop content that can be categorized as IP. The ventures IP generates income, sustains and grow the venture to its eventual success. So factoring IP protection to have a strong correlation to the success of a venture is conclusive (Jennex et al., 2004).

Infrastructure

Infrastructure can be categorized into many aspects with respect to a new technology venture. While there are many classifications, Jennex et al. (2004) identified the following aspects:

- Business Infrastructure – The factors that helps keep the business running, from advertising, communication to operations and legal infrastructure.
- Technical Infrastructure – Underlying networks, hardware and technical skill of the employees which ensures the applications/services are running.

Furthermore, technological infrastructure refers to the sophistication and reliability of communication technology. Software firms require abundant, reliable, and cheap telephone and broadband data communication connections (Carmel, 2003). Greater

awareness and knowledge in infrastructure has affected the growth of Government and private entities. Replicating this within a new technology venture can have a significant impact on its survival and eventual success (Chorev and Anderson, 2006).

In cases where this infrastructure is absent on a national basis, "cluster-centered infrastructure" (technology parks or high tech office centers) are the preferred alternatives for software firms. Clustering also addresses other infrastructure needs such as ventures operating in buildings and technology parks with alternative power generation to compensate for unreliable public sources (Carmel, 2003). Another method for obtaining technical infrastructure is through cloud services. Cloud services have emerged as one of the main infrastructure providers for start-ups around the world. Cloud computing can provide a large reduction of infrastructure, creating a huge advantage for many start-ups. Infrastructure as a Service or IaaS focuses on providing compute cycles, storage, databases, content distribution, and other IT resources on demand. IaaS forms the basis for most cloud computing solutions and often provides nearly unlimited resources and elasticity. Using the cloud services these ventures can compete with the best in their industry as the services are flexible and configurable to the ventures requirement (Tucker, 2009).

2.4.5. Government Policies

Many nations succeeded because their government took active steps to encourage the high-tech sector in general or the software industry in particular. Such policies have been given many labels such as industrial policy, science and technology policy, and innovation policy (Salmenkaita and Salo, 2002). Country's economy is directly related to the stability of the government and its policies. A healthy economy boosts the performance of start-ups because of the purchasing power of the consumers. Government expenditure on infrastructure development, R&D, and entrepreneur helping programs can be expected only when the economy is boosting. Peaceful environment in a country attracts foreign investors. Local entrepreneurs can tie up

with them to start new businesses. Reputation of the country plays a big role when a firm competes in overseas markets (Jayasena and Nanayakkara, 2012). Governments can leverage its influence over the private sector through its pressure to subscribe to be ideals of becoming a high-technology society. The government itself could nominate several technology-based ventures as 'promising' ones and provide them with R&D funding. Such endorsement also bolsters their legitimacy. Several commercial banks also have taken initiatives to annually nominate promising small enterprises. The new venture obtains access to loans at below market rates. Such endorsement likewise bolsters a start-up's legitimacy (Lee et al., 2001). In a global marketplace regulatory environments can make or break new technology ventures. While these regulations are country specific, having flexible regulations can be advantages (Jennex et al., 2004).

The government can influence/facilitate the development of infrastructure and development of human capital which will help build successful technology ventures. It is also observed that government intervention to help build its technology sector had a positive effect on certain cases (Carmel, 2003). A "National Vision" is considered important to guide the way for technology ventures to thrive (Jayasena and Nanayakkara, 2012).

Governments if they choose to can also act as Venture Capitalists (VC). VC activity increases the total amount of VC funding available. This evidence emerges from analysis at both the enterprise level and the market level. At the enterprise level, we can find that enterprises receive mixed funding. Funding from both the Government VCs and private VCs tend to receive more funding in total than enterprises financed purely by private VCs do. Furthermore, enterprises with mixed funding tend to have more VC investors and, strikingly, obtain more private VC funding than other enterprises. With sufficient funding for its R&D and operational efforts new technology ventures have a better chance of survival (Brander et al., 2014). However, a factor that should be considered in any analysis of new start-up is the role played

by the state in enabling the creation of firms by providing funding at preferential interest rates, via tax incentives or with subsidies (Soriano, 2010).

2.5. Summary

This chapter reviewed current literature available in the domain of entrepreneurship and its successes vs. failures. The literature has shown the path to take and the variables to be measured in this study.

The definition and understanding of what is a software start-up and what is meant by the success for a start-up were discussed. This is important as the target population was derived from the successes in the industry. Important variables such as industry experience, marketing experience, prior start-up experience, communication between founders, innovativeness, R&D investment, competition and competitor intensity, market scope, marketing intensity, customer orientation, financial resources, IT workforce, alliances, mentors, university partnerships and incubators, patent protection, infrastructure and Government policies were uncovered by going through the current literature available. These variables were categorized under five categories to better understand the breakdown of these factors. Founding team, innovation and R&D, industry and market, resources and Government policies were selected as the categories. In the next chapter the study will try to differentiate the variables to design the research methodology of this study.

3. METHODOLOGY

The aim of this research is to find the most critical success factors that affect the success or failure of a tech start-up (i.e., software development start-up). Sri Lankan IT industry has a lot of success stories with regards to start-ups. These entrepreneurial leaders who have attempted and succeeded in building a start-up to its eventual success was selected as the target population for this study. The study is being based on a set of case studies of several entrepreneurs who have built their start-ups in Sri Lanka and were successful. The methodology adopted also incorporated the factors each of them has experienced. Section 3.1 presents the conceptual framework that is used to critically evaluate and uncover the critical success factors for being successful. Section 3.2 presents the process of deriving hypothesis from the identified factors. Section 3.3 discusses the collection of data while Section 3.4 discusses the data analysis method of those data.

3.1. Conceptual Framework

The conceptual framework refers to the usability and validity of the variables that were uncovered to be relevant to the study. By identifying the relationship among these variables which are industry experience, marketing experience, prior start-up experience, communication between founders, innovativeness, R&D investment, competition and competitor intensity, market scope, marketing intensity, customer orientation, financial resources, IT workforce, alliances, mentors, university partnerships and incubators, patent protection, infrastructure, and Government policies the study strives to establish a model for future startups to follow. The proposed conceptual framework is illustrated in Figure 3.1. It is designed based on the factors identified from the literature review. The framework consists of factors that affect the success of a new technology venture.

The 18 factors which were identified from the related work were categorized into five major categories as illustrated in Figure 3.2. The main purpose of this is to clearly identify certain categories uncovered through the study and by no means a cumulative of the factors.

Industry experience, marketing experience, prior start-up experience, and communication between founders were categorized as *founder traits*, which will mainly consist of factors related to the founders of the start-up. Innovativeness and R&D investment were categorized as *innovation and R&D*, which is a key aspect of any technology venture. Competition and competitor intensity, market scope, marketing intensity, and customer orientation were categorized as *industry and market* category, which deals with the industry and market at the early stages of the start-up. Financial resources, IT workforce, alliances, mentors, university partnerships and incubators, patent protection, and infrastructure were categorized as *essential resources* for start-ups and finally *Government policies* represent the Government and its involvement in the start-up.

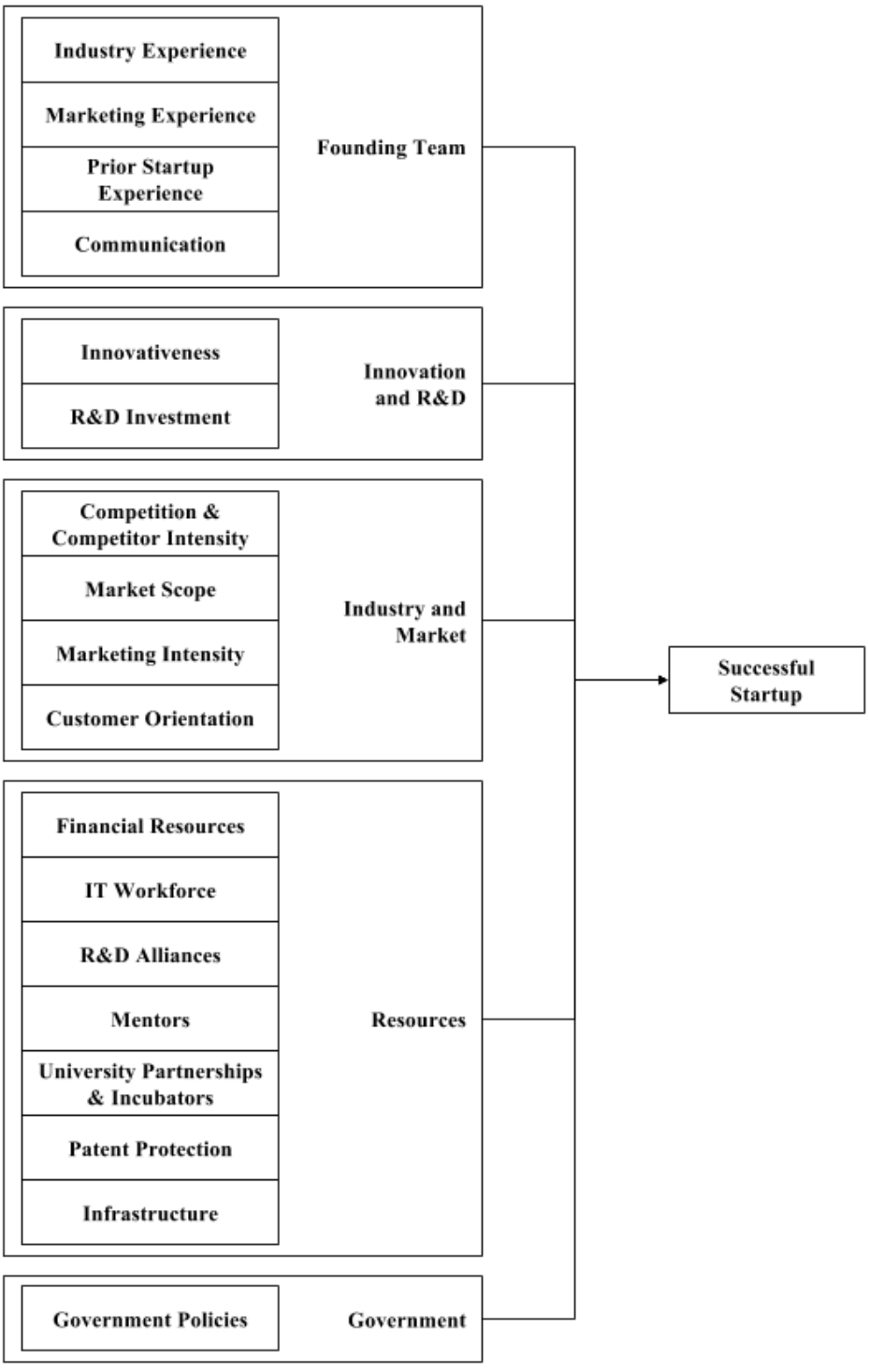

Figure 3.1 - Conceptual framework.

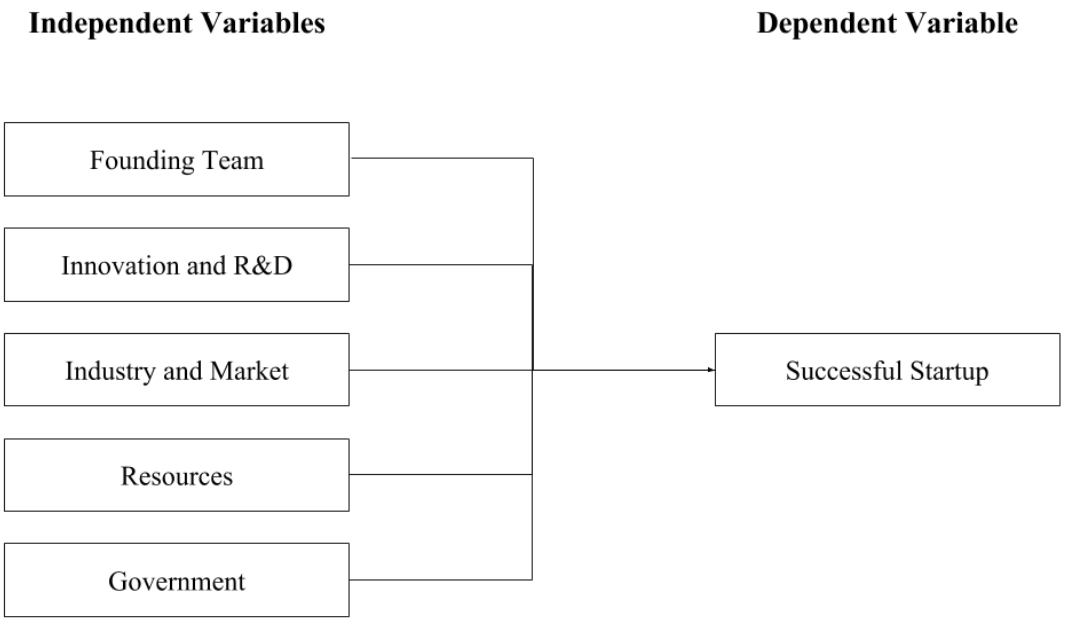

Figure 3.2 - Dependent and independent variables.

3.1.1. Definition of Variables

Dependent Variable

The dependent variable in this study focuses on the variable which responds to the changes in independent variables. *Success of the Start-up* is the dependent variable as the ultimate goal is to become successful and this will not change throughout the study.

Independent Variables

The independent variables considered for the study focuses on key factors uncovered through reviewing literature. Independent variables defined in Table 3.1 have a direct impact on the dependent variable.

Table 3.1 - Independent variables.

Variables	Variable Type	Dimensions
Founding Team	Industry Experience	Industry experience of the founding member.
	Marketing Experience	Marketing experience of the founding member.
	Prior Start-up Experience	Prior Start-up Experience of founding member.
	Communication	Quality of interaction between founding members.
Innovation and R&D	Innovativeness	Innovativeness of the company as whole.
	R&D Investment	Total investment on R&D in the company.
Industry and Market	Competition Intensity & Competitor Orientation	Number of competitors in the market. Level of commitment the company places on improving aspects with respect to its competitors.
	Market Scope	The scope which the company focus on.
	Market Intensity	Market share the company has with respect to the target market.
	Customer Orientation	Level of commitment the company places on its customers.
Resources	Financial Resources	Financial Resource at hand by the founders.
	IT workforce	Company workforce and skill level.
	R&D Alliances	Alliances with regard to R&D with the industry.
	Mentors	Mentoring from Industry Leaders.
	University Partnerships and Incubators	Partnerships with universities for R&D, recruitment and Internships.
	Patent Protection	Number of patents the company has acquired and its benefits.
	Infrastructure	Physical and Virtual infrastructure of the company.
Government Policies	Government Policies	Government policies that affect the growth.

3.1.2. Relationship among Variables

When finding relationships within the variables, successfully establishing a start-up in Sri Lanka is considered the dependent variable, which is the main area of interest in this study. The factors that would contribute to the success of the start-up were considered the independent variables. The relationships of these were set as the dependent variable is dependent on the independent variables. Hence, the success of the start-up can directly depend on any of the factors found within the study.

The discussion was focused on defining how the actual success was measured with the population for this study. Tech ventures which were start-ups when they initially were formed have now moved on to become established ventures. Clearly defining success is critical for this study because this will provide the benchmark measure of success of a tech venture which will be studied to establish the critical success factors.

Definition of success for start-ups was formulated after reviewing 30+ technology ventures currently operating in Sri Lanka. Some, being large corporate while others were reputed and established organizations that are successful at what they do. Hence, as portrayed in Table 3.2 the following categorization of a successful start-up was defined.

Success of a start-up can be due to many factors uncovered within this study. Going forward, the study attempts to examine the factors defined in Table 3.1 along with previous research reviewed throughout this study. These five factors were established by combining 18 other sub-factors as defined in Table 3.3.

Table 3.2 - Factors for a successful start-up.

Factor	Benchmark
Founder(s)	At least one founder in the founding team should be a Sri Lankan national.
Based on	Must be based in Sri Lanka.
Years of Operation	Minimum of 5 years in operation.
Number of Products	One or more product(s)/project(s) in the market.
Profit/Growth	Must be making profit.
Number of Employees	20+ employees.

3.1.3. Hypothesis Development

To validate whether the relationships found in the literature are true, the study derived several hypothesis. Qualitative research such as this can develop hypothesis to test the validity of the results. While in qualitative studies researchers claim to develop hypothesis, it is rarely tested. Researchers should explain and maybe question the hypothesis with respect to the actual research. The creation of hypothesis with respect to external validity is to ascertain whether or not the study hypothesis or results can be applied in other settings. Presentation of contextual background material such as demographics and study setting is necessary, if the reader is to be able to ascertain for which situations the findings might provide valid information (Malterud, 2001).

Table 3.3 - Independent variable with previous research.

Variable	Associated Previous Research
Industry Experience	Song et al. (2008); Shrader and Siegel (2007); McDougall et al. (2003); Gelderen et al. (2005); Ruef (2002)
Marketing Experience	Song et al. (2008); McDougall (2003); Friar and Meyer (2003)
Prior Start-up Experience	Tamer (2005); McDougall et al. (2003)
Communication	Mueller and Gemünden (2009)

Innovativeness	Bayus and Agarwal (2007); Zahra et al. (2000); Hyytinen et al. (2015); Bayus and Agarwal (2007)
R&D Investment	Deeds (2001); Hall and Lerner (2010); Blazenko et al. (2012); Ganotakis and Love (2011)
Competition Intensity & Competitor Orientation	Porter (2000); Slater and Narver (2000); Atuahene-Gima et al. (2006); Li (2001)
Market Scope	Chen (2009); Song et al. (2010); Atuahene-Gima et al. (2006); Prashantham and Young (2011)
Market Intensity	Li (2001); Zahra et al. (2000)
Customer Orientation	Hakala and Kohtamäk (2011); Mueller and Gemünden (2009)
Financial Resources	Tamer (2005); Soriano (2010); Bertoni et al. (2011); Jayasena and Nanayakkara (2012); Fu (2014); Colombo and Grilli (2007); Revest and Sapio (2012); Madill et al. (2005)
IT workforce	Jennex et al. (2004); Barr and Tessler (1999); Jayasena and Nanayakkara (2012); Carmel (2003); Carmel and Tjia (2005)
R&D Alliances	Perez et al. (2013); Tamer, (2005)
Mentors	Madill et al. (2005); Saarenketo et al. (2009)
University Partnerships & Incubators	Song et al. (2008); Atkinson and Pelfrey (2010); Phan and Siegel (2006); O'Neal (2005); Lendner (2007)
Patent Protection	Cockburn and MacGarvie (2009); Jennex et al. (2004)
Infrastructure	Jennex et al. (2004); Carmel (2003); Chorev and Anderson (2006); Tucker (2009)
Government Policies	Salmenkaita and Salo (2002); Jayasena and Nanayakkara (2012); Lee et al. (2001); Jennex et al. (2004); Carmel (2003); Brander et al. (2014); Soriano (2010)

As Malterud (2001) describes, the hypothesis to be tested will become the actual questions, which will be submitted for the interviewees. Hypothesis listed below will be used to confirm that this actually contributes to the success of a technological start-up.

Let;

H_0 : Null Hypothesis

H_A : Alternative Hypothesis

Hypothesis 1

$H1_0$: Industry experience of the founder(s) does not have any impact on the success of a tech start-up.

$H1_A$: Industry experience of the founder(s) has a direct impact on the success of a tech start-up.

Hypothesis 2

$H2_0$: Marketing experience of the founder(s) does not have any impact on the success of a tech start-up.

$H2_A$: Marketing experience of the founder(s) has a direct impact on the success of a tech start-up.

Hypothesis 3

$H3_0$: Prior start-up experience of the founder(s) does not have any impact on the success of a tech start-up.

$H3_A$: Prior start-up experience of the founder(s) has a direct impact on the success of a tech start-up.

Hypothesis 4

$H4_0$: Communication skills of the founder(s) does not have any impact on the success of a tech start-up.

$H4_A$: Communication skills of the founder(s) has a direct impact on the success of a tech start-up.

Hypothesis 5

$H5_0$: Innovativeness does not have any impact on the success of a start-up.

$H5_A$: Innovativeness has a direct impact on the success of a start-up.

Hypothesis 6

$H6_0$: High research and development investment does not have any impact on the success of a start-up.

$H6_A$: High research and development investment has a direct impact on the success of a start-up.

Hypothesis 7

$H7_0$: Competition and Competitor intensity in the industry does not have any impact on the success of a start-up.

$H7_A$: Competition and Competitor intensity in the industry have a direct impact on the success of a start-up.

Hypothesis 8

$H8_0$: Market scope of the start-up does not have any impact on the success of the start-up.

$H8_A$: Market scope of the start-up has a direct impact on the success of the start-up.

Hypothesis 9

$H9_0$: Marketing intensity of the start-up does not have any impact on the success of the start-up.

$H9_A$: Marketing intensity of the start-up has a direct impact on the success of the start-up.

Hypothesis 10

$H10_0$: Customer orientation of the start-up does not have any impact on the success of the start-up.

$H10_A$: Customer orientation of the start-up has a direct impact on the success of the start-up.

Hypothesis 11

$H11_0$: Financial Resource available does not have any impact on the success of a start-up.

$H11_A$: Financial Resource available has a direct impact on the success of a start-up.

Hypothesis 12

$H12_0$: IT workforce of the start-up does not have any impact on the success of the start-up.

$H12_A$: IT workforce of the start-up has a direct impact on the success of the start-up.

Hypothesis 13

$H13_0$: Research and Development alliances of the start-up does not have any impact on the success of the start-up.

$H13_A$: Research and Development alliances of the start-up have a direct impact on the success of the start-up.

Hypothesis 14

$H14_0$: Mentors do not have any impact on the success of the start-up.

$H14_A$: Mentors have a direct impact on the success of the start-up.

Hypothesis 15

$H15_0$: University partnerships and Incubators do not have any impact on the success of a start-up.

$H15_A$: University partnerships and Incubators have a direct impact on the success of a start-up.

Hypothesis 16

$H16_0$: Patent Protection does not have any impact on the success of the start-up.

$H16_A$: Patent Protection has a direct impact on the success of the start-up.

Hypothesis 17

$H17_0$: Infrastructure of the start-up does not have any impact on the success of the start-up.

$H17_A$: Infrastructure of the start-up has a direct impact on the success of the start-up.

Hypothesis 18

$H18_0$: Government and Government policies do not have any impact on the success of the start-up.

$H18_A$: Government and Government policies have a direct impact on the success of the start-up.

3.2. Methodology Selection

Methodology for this study was selected based on a number of factors to make the study more reliable. The study which deals with entrepreneurial endeavors of individuals where it has gone on to become a success. Prior research on this area is mostly based on case studies of each individual or case. Taking a quantitative approach for this study is irrelevant as the population size would be small and the experiences and strategies used by the population (in this instance entrepreneurs) tend to be vastly different from one-another. Hence, a qualitative approach was considered as the methodology for this study. The study will be based on personal experiences and environment the start-up was at during its start-up phase. The methodology selected reflects the case-by-case accounts of each individual to

understand and analyses the results to gain understanding of the topic “critical success factors for tech start-ups in Sri Lanka”.

With qualitative research, it is important to choose the method on which the analysis will be conducted. Some of these methods include ethnography, grounded theory, phenomenology, and historical research (Hsieh and Shannon, 2005). Most of the qualitative research analysis begins during data collection as the data already gathered are analyzed which in turn shapes the ongoing data collection (Pope et al., 2000). This added advantage allows the researcher to go back and refine questions, develop hypotheses, and pursue emerging avenues of inquiry in further depth. Crucially, it also enables the researcher to look for deviant or negative cases; that is, examples of talk or events that run counter to the emerging propositions or hypotheses and can be used to refine them. Such continuous analysis is almost inevitable in qualitative research (Pope et al., 2000).

Analysis stage includes analyzing the data gathered through the series of interviews. While there are many options available for analysis of unstructured data, the study opted to use Grounded Theory as the method for data analysis.

Grounded theory is a research method that enables the researchers to develop a theory which offers explanation about the main concerns of the population of the substantive area and how those concerns are resolved or processed (www.groundedtheoryonline.com). It is a qualitative research procedure that strives to break barriers in research. Unorthodox and skeptical, such research goes beyond existent theories and preconceived conceptual frameworks in search of new understandings of social processes in natural settings (Hutchinson, 1986). In the early 1960s, sociologists Barney Glaser and Anselm Strauss combined rigor and flexibility resulted in the development of a new qualitative methodology called Grounded Theory.

Methodology on how to use the grounded theory has to be clearly presented as this was used in the study. As per Sbaraini et al. (2011) the components presented in Table 3.4 are important when performing grounded theory based research.

Table 3.4 - Fundamental components of grounded theory study

Component	Stage	Description
Openness	Throughout the study	Grounded theory methodology emphasizes inductive analysis. Deduction is the usual form of analytic thinking in medical research. Deduction moves from the general to the particular: it begins with pre-existing hypotheses or theories, and collects data to test those theories. In contrast, induction moves from the particular to the general: it develops new theories or hypotheses from many observations. Grounded theory particularly emphasizes induction. This means that grounded theory studies tend to take a very open approach to the process being studied. The emphasis of a grounded theory study may evolve as it becomes apparent to the researchers what is important to the study participants.
Analyzing immediately	Analysis and data collection	In a grounded theory study, the researchers do not wait until the data are collected before commencing analysis. In a grounded theory study, analysis must commence as soon as possible, and continue in parallel with data collection, to allow theoretical sampling.
Coding and comparing	Analysis	Data analysis relies on coding – a process of breaking data down into much smaller components and labelling those components - and comparing - comparing data with data, case with case, event with event, code with code, to understand and explain variation in the data. Codes are eventually combined and related to one another - at this stage they are more abstract, and are referred to as categories or concepts.
Memo-writing (sometimes also drawing diagrams)	Analysis	The analyst writes many memos throughout the project. Memos can be about events, cases, categories, or relationships between categories. Memos are used to stimulate and record the analysts' developing thinking, including the comparisons made.

Component	Stage	Description
Theoretical sampling	Sampling and data collection	Theoretical sampling is central to grounded theory design. A theoretical sample is informed by coding, comparison and memo-writing. Theoretical sampling is designed to serve the developing theory. Analysis raises questions, suggests relationships, highlights gaps in the existing data set and reveals what the researchers do not yet know. By carefully selecting participants and by modifying the questions asked in data collection, the researchers fill gaps, clarify uncertainties, test their interpretations, and build their emerging theory.
Theoretical saturation	Sampling, data collection and analysis	Qualitative researchers generally seek to reach *saturation* in their studies. Often this is interpreted as meaning that the researchers are hearing nothing new from participants. In a grounded theory study, theoretical saturation is sought. This is a subtly different form of saturation, in which all of the concepts in the substantive theory being developed are well understood and can be substantiated from the data.
Production of a substantive theory	Analysis and interpretation	The results of a grounded theory study are expressed as a substantive theory, that is, as a set of concepts that are related to one another in a cohesive whole. As in most science, this theory is considered to be fallible, dependent on context and never completely final.

3.3. Data Collection

The target population for this study is entrepreneurs and founders of technological start-ups that have become successful. Considering Sri Lankan start-ups, the population is relatively small compared to the global industry. When considering collecting data relative to these start-ups, the task is quite hard as not much content is readily available. Quantitative approaches will not suite this study as most of the experiences, struggles and achievements of these individuals are unique to themselves. Hence, this study focuses on a qualitative approach where each individual will be taken as a case and measured according to the interview content.

An interview with a semi structured questionnaire was taken as the method of data collection.

3.3.1. Interview Questionnaire Development

Interviews were selected as the main method for data collection in this study. The questionnaire instrument (see Appendix A) consists of semi-structured, open-ended questions that are designed to get the most amount of information from questions that have direct references to the hypothesis developed in Section 3.1.3. It is often said that good in-depth interviewing involves open questions. These are contrasted with dichotomous yes/no questions which call for affirmation rather than description. In-depth interviewing involves only open questions is to understate the specificity that good interviewing requires. Both content mapping and content mining involve asking questions which vary in terms of how broad or narrow they are (Patton, 2005).

With the intention of getting as much information as possible from a small number of questions, an open ended, semi-structured questionnaire was developed while covering all the independent variables found within this study.

3.3.2. Pilot Study

A pilot study (interviews) was conducted with three young entrepreneurs who have started their start-ups recently. The objective of these interviews was to measure what kind of an input, the study can capture through interviews and to clarify whether the questions are accurate or if any modifications are required to get the most out of an interview. After the initial pilot study, several modifications were done to the semi-structured questionnaire instrument to reflect the findings.

Participants conveyed that there were many challenges they had to face which made the company what it is now. Taking this as basis a question was added to the questionnaire. Furthermore, motivation was found to be a factor which influenced the entrepreneur to ultimately go ahead and start the start-up. Hence, a question to identify founder motivation was included.

3.3.3. Interviews

The interviews are the most critical part of this study. Entrepreneur perceptions, struggles and experiences are at the core of qualitative research and this was the main motivation for gathering data through semi-structured interviews. Interviews were conducted with the target population which were entrepreneurs and founders of their respective start-ups. An interview request email (see Appendix B) and letter (see Appendix C) were sent out to the target group before the interview. Furthermore, personal contacts and other means were used to obtain appointments for interviews.

Interviews can provide insights which are not available to researchers working with large survey data samples and is the most suitable approach when seeking rich data illuminating individuals' experiences and attitudes. Drawbacks of interviews are that they are very time-consuming to conduct and analyses. The questions were conducted where the interviewees were comfortable and in a manner which much of the information would be obtained from the interviewee. The open-ended questions were put forward and the interviewee was given all the time required to give detailed accounts of their story.

This study was guided through Grounded Theory which emphasizes the importance of coding the data as soon as an interview is concluded. Following this practice the interviews were transcribed and coded immediately after they took place. Hence, initial findings from interview coding were helpful in shaping the questions for subsequent interviews.

3.3.4. Participant Profiles

The participants for this study were selected after evaluating 30+ companies in Sri Lanka. The criteria that were used were described in Table 3.2. The study being anonymous shares the brief profile of the companies as below:

Profile 001

With over 20 years in the industry this was considered one of the earliest tech start-ups in Sri Lanka. Founded by five members just coming out of school they managed to build an innovative product company that focuses on HR, Radio broadcasting and many other domains in Sri Lanka and now globally.

Profile 002

Started as a product company with web based diagramming in mind, this company, founded by five members is now in operation for more than 8 years. Still in the start-up stages and venture backed, they provide one of the world's best known tools for web diagramming.

Profile 003

A company with over 15 years in the industry and the only start-up in this study to be founded by a single person. Initially starting as project based start-up they moved in to HR and mobile platform company. They hold majority of the shares in the Sri Lankan HR software industry and has expanded globally.

Profile 004

A company that has been in operations for more than 10 years in Sri Lanka. Originally a project company they moved in to product and considered one of the main software providers to banking sector and corporate.

Profile 005

A company that was incepted in 2007 was project based with consulting as the main area of expertise. Founded by two members and mainly focused on open source software. Consultancy included Sri Lankan government projects and global disaster management solutions.

Profile 006

A company in operation for more than eight years in Sri Lanka. Originally founded by 3 members is an online product that lets users manage invoicing and billing of its customers. A company with global customer base that keeps growing.

Profile 007

A technology company that is now in operation for more than 10 years in Sri Lanka. Originally a service company that did projects in Sri Lanka it has grown to IT Services Company. A venture backed company which is successful in Sri Lanka and globally.

Profile 008

A company that is now in operation in Sri Lanka for more than seven years. Founded by three individuals who were at the helm of the industry, it has since grown to become a product and services company with clients locally and globally.

3.4. Analyzing the Interview Data

As observed in Section 3.2 the Grounded Theory uses a methodology to analyze unstructured data to bring meaning and ultimately develop a theory. As with Grounded Theory process interviews were coded, categorized to find relationships between them. The following section describes coding, categorizing, memo writing, theoretical sampling and theoretical saturation in detail.

3.4.1. Coding Interview Data

Coding is the backbone for the analysis of Grounded Theory. It is the pivotal link between collecting data and generating a theory. In Grounded Theory coding consists of two main phases: 1) initial phase involving naming each word, line, or segment of data followed by 2) a focused selective phase that uses the most significant or frequent codes to sort, synthesize, integrate and organize large amounts of data (Charmaz, 2006).

In this study the same approach was taken to code the interview data. MAXQDA a world leading qualitative data analysis software was used for analyzing these interview data. Through this program the interviews were transcribed and coded according to the relevance of the section of the transcript. The factors that were decided with the literature review were used when coding, as well as codes that were appropriate when coding the interview transcripts.

3.4.2. Developing Categories

Categories explicate ideas, events, or processes in the collected data. A category may subsume a common theme or a pattern of several codes that were uncovered in the coding stage. The categories must be conceptual as possible with analytic direction and precise wording. Simultaneously, remain consistent with the data. Focused codes

lead to sharp, clear categories and doing so establish criteria for categories to make further comparison (Charmaz, 2006).

Within the study there were high-level factors identified in the literature review. These factors were used as categories when making sense of the codes that were established. Furthermore, the codes that were not falling under these were categorized separately to bring out the most suitable information.

3.4.3. Memo Writing

Memo-writing is a pivotal intermediate step which needs to be executed between data collection and drafting of the theory. When writing memos the researcher was able to emphasize experiences gained through the interview and capture the general feeling which won't be visible through the interview transcripts. Memos capture the thought process of the study, and writing memos can accelerate the thinking of the researcher to bring more depth into the study (Charmaz, 2006).

The study focused on writing memos all along the data coding phase. Numerous memos were written to highlight the details of the interviews, reaction of the interviewees and other related details that were uncovered at the coding stage.

3.4.4. Theoretical Sampling

Theoretical sampling is central to grounded theory design. A theoretical sample is derived from coding, categorizing, comparison and memo-writing. It is designed to serve the developing theory with the coding and categorizing mixed with memo-writing, it should reflect the qualities of the respondents' experiences and provide a useful analytical handle to understand them (Charmaz, 2006).

Within this study the researcher strived to build a model that would derive from the findings of the study. After coding, categorizing, memo writing and eventually

analyzing the data the researcher was able to find connections between codes that were ultimately mapped to gain understanding of the data collected.

3.4.5. Theoretical Saturation

Qualitative researchers generally seek to reach "saturation" in their studies. This indicates that the researcher is not hearing anything new from the interviews or data collection. In grounded theory, theoretical saturation is sought so as to confirm that further data collection will not yield any more new information (Charmaz, 2006).

Throughout this study the researcher's task was to find the critical success factors for the success of tech start-ups in Sri Lanka. While the interviews were conducted it brought in various angles for the researcher to look at when analyzing the data. Theoretical saturation was achieved when the interviews did not give any new concepts or views on what made them become a successful startup.

3.5. Summary

This chapter presented the methodology to be used in the study. 18 factors which were uncovered through the literature review were used to create a conceptual framework and hypothesis which will be tested in this study.Dependent and independent variables of the study and hypothesis were generated based on these variables. Interviews were used as the method of data collection since this is a qualitative research. Finally, the usage of grounded theory in the study was discussed in detail.

In the next chapter the study goes further into analyzing the gathered data through the use of grounded theory. The analysis covers results of the coded, categorized data, and memos while building the factors that contribute to the success of tech start-ups in Sri Lanka.

4. ANALYSIS AND INTERPRETATION

This chapter provides a detailed analysis of interview observations and results of the present study. With Section 4.1 the study discusses the methodology that was used for the analysis and how the data was analyzed. Section 4.2 highlights the research results with interview details and analysis of the overall findings. Section 4.3 looks into the hypothesis that was generated initially in the study and how the results map into these factors.

4.1. Grounded Theory Analysis

Grounded Theory was used as the analysis methodology, coding, categorizing, memo-writing, and theory generation phases of this theory were followed. Next, the study discusses codes and categories adopted for this study, and how the memos were utilized for the analysis.

Coding and Categories

Coding is a pivotal part while using the Grounded Theory that is conducted alongside data collection. The frequency of the codes and overall percentages are listed in Table 4.1. The table lists the categories which were identified during the study and corresponding codes, frequency and percentage of the total frequency of all codes.

Memo Writing

Memos were utilized to capture reactions, behavior and other related content of the interviews. These were information that was not captured through the interviews and information that the researcher decided should be included when analyzing the data.

Table 4.1 - Code list.

Category	Name	Frequency	Percentage
Resources	IT Workforce	14	7.65
Resources	Financial	13	7.10
Industry and Market	Customer Orientation	11	6.01
Industry and Market	Competition Intensity	10	5.46
Industry and Market	Market Scope	10	5.46
Founders	Motivation	9	4.92
Industry and Market	Marketing Intensity	9	4.92
Founders	Passion	9	4.92
Innovation and R&D	R&D Investment	7	3.83
Founders	Focus	7	3.83
Founders	Industry Experience	7	3.83
Founders	Founders	7	3.83
Innovation and R&D	Innovativeness	7	3.83
Resources	Mentors	7	3.83
Industry and Market	Competition	6	3.28
Founders	Prior Startup XP	5	2.73
Resources	Infrastructure	4	2.19
Industry and Market	Brand	4	2.19
Founders	Planning	4	2.19
Industry and Market	Networking	3	1.64
Founders	Learning from Mistakes	3	1.64
Founders	Communication	3	1.64
Government	Government	3	1.64
Industry and Market	Credibility	3	1.64
Founders	Marketing Experience	3	1.64
Founders	Learning	3	1.64
Resources	University Partnerships	2	1.09
Culture	Culture	2	1.09
Resources	Incubators	2	1.09
Industry and Market	Recognition	2	1.09
Resources	R&D Alliances	1	0.55
Culture	Diversity	1	0.55

Category	Name	Frequency	Percentage
Industry and Market	multi-industry pairings	1	0.55
Industry and Market	Industry and Market	1	0.55
Innovation and R&D	Innovation and R&D	0	0.00
Resources	Patents	0	0.00
Resources	Resources	0	0.00
	Total	183	100.0

4.2. Research Results and Discussion

The study, conducted through the use of grounded theory was to collect knowledge, and answers the research question, what are the key success factors for tech start-ups in Sri Lanka. Throughout this study interviews and other forms of collected data were analyzed through the use of Grounded Theory. Based on these, data was coded and categorized accordingly. From the literature review, the study had already defined several factors. Therefore, based on those factors most of the codes were categorized. Founders, innovation and R&D, industry and market, resources, and the Government were some of the main categories that were predefined. But, as the analysis began the researcher managed to uncover codes that did not fit the description of the already defined codes. These were added separately and used for the categorization.

4.2.1. Founders

Founders of a start-up play an unfathomable part in the success of tech start-ups. Past research clearly states how important the founders are to the start-up (Shane and Venkataraman, 2000). Throughout the study it was evident how the founders played a massive role in shaping the organization and its success.

Industry Experience

The subjects of this study indicated that they had ample industry experience when initiating their start-up. Industry experience has played a key role in molding these individuals in order to groom their knowledge and actually help them start in the first place. Out of all interviews, only one founder has been able to successfully establish his start-up just coming out of school. Based on interviews, the important common skill among all founders was the exposure to the technological industry;

> *"We were all good programmers from school days. We all knew how to code since we were at school. I personally was able to code in about five to six programming languages"*

Thus, these founders learned their programming at a much earlier stage before they came to the industry. Knowing how to code when writing a software program is the most basic aspect.

It was observed that all except one founder were graduates that went into the industry, worked for several years, and then decided to move into an entrepreneurial path. The one founder that did not graduate was a hardcore programmer which led him to start his company. Although they did not have any exposure to the IT industry they were doing some projects which they thought were successful. So, it was evident that experience in the industry was key for them to initiate at the beginning. When inquired "how the industry experience impacted in the start-up phase" the researcher found that without industry experience much of the tasks would not be possible. Recruiting, planning, strategizing, and even developing the required software would not be possible, if not for experience in the IT industry. Being in the industry shaped these individuals on the methods and processes that were practiced in the industry which they brought into the start-up. Shrader and Siegel (2007) found there is a direct link between industry experience of the founders and venture

performance and with this study, researchers can clearly see how much of an impact industry experience can have on any start-up.

This is quite a significant factor since all the other gathered data indicated that industry experience played a key part in the start-up stage, as it guided the founders on which path to take with their start-ups. While the study shows that one founder did not have any industry experience, He had a major background in software development. With this information it is evident how much of an impact industry experience plays in the success of the start-up for it to be called a critical success factor.

Prior Start-up Experience and Learning

Failures can teach in a way that success cannot. Having prior start-up experience can be beneficial to avoid such failures (Tamer, 2005). Throughout the study interviewers were questioned about their prior experiences in the start-up landscape. While some of the founders had prior start-up experience, some founders got it right on the first time. Although they were successful, they agreed that there were lots of mistakes that finally molded the path to success. When asked about prior start-up experiences one of the interviewees said:

> *"Right after school we had a services company that built websites for companies in Sri Lanka. Others also has done some small random businesses and little things"*

> *"I started like stuff in school like products that we built, but didn't try to sell it"*

Based on the responses from this study, it can be said that while prior start-up experience did help, it did not significantly improve the success rate in start-ups that were considered.

While prior start-up experience had an impact on the entrepreneurial landscape in Sri Lanka, the founders were not error prone. Even if they manage to start-up in the first try, those experiences were full of errors. For example, bringing your learning's into the start-up.:

> *"Even though we managed to get things started, I'll tell you frankly the rest is all trial and error"*

One of the most common themes in this study was the founders emphasizing the importance of learning from their own mistakes. One of the participants went on to give the following advice:

> *"Even if you don't succeed you know what it is. I mean, I have people who have given up and gone back to jobs after being an entrepreneur for a couple of years but that learning that you get. That is with you forever."*

Making mistakes is not ideal for any start-up that wants to become successful. But, they are inevitable and somewhere down the entrepreneurial path it is bound to happen. While making mistakes is not a success factor, learning from them is the key for any entrepreneur. This was evident as all of the candidates made mistakes down the entrepreneurial road.

Making mistakes, correcting them and eventually learning from your mistakes is one important stage in any start-up. But, the researcher uncovered that while mistakes can lead to a failed start-up, managing and outlasting those mistakes is one of the skills any entrepreneur should possess in their intellectual arsenal. The participants of this study did make mistakes and they were happy to admit that. What kept them from

becoming unsuccessful was the ability to manage and eventually recover from those mistakes. A participant went on to say;

> *"Even though we make mistakes we kept our costs low so we can outlast our mistakes and run for a longer time and we were not afraid to try things. Keeping our costs low made us able to absorb our mistakes and keep running."*

It can be concluded that while in any venture mistakes can happen, managing them until the venture can get past that is essential for the start-up's success. This factor was not identified in the literature review, but is an essential part of any entrepreneurial venture.

Motivation and Passion

Motivation and passion drives any entrepreneur to create new start-ups. While these traits can be obvious and essential to the success of a start-up the question is "how can it impact the success of a start-up?" When taking motivation into consideration, it was uncovered that most of the founders were in the industry and then wanted to follow something of their own.

> *"We all want to do something on our own and wanted to create something on our own. I think some of the things that I used to dream and think about is you know many eras before I started."*

While this was the motivation for most of the start-ups in Sri Lanka there are always exceptions:

> *"It was complete accidental but we were all good programmers from school days. So, what happened was the initial product we built for fun, we had a market. We didn't have a choice than start it as they kept asking for support."*

So the analysis shows motivation can come in many different forms, but having the motivation to start something new and bringing something into the market is essential. When considering passion throughout this study the main thing that came up was the word "passion". It was that passion that drove these entrepreneurs to achieve what they have achieved. The best advice that came from these rounds of interviews was:

> *"You have to be prepared that you will not succeed the first time. There will be certain kinds of obstacles, there will be certain kinds of road blocks and every time something like that happens what you have to think about is I need to get over this because there will be many people who gave up at that point and the guys who stayed and who persevered was able to move to a kind of the next level so I think that is key I call it the never give up spirit in you I think that is what is key to any entrepreneur."*

Passion is paramount in the world of entrepreneurs. It makes the difference between going forward or just stopping and giving up. Passion played a major part in the making of these ventures and still does. With passionate people at the helm of the company anything is possible.

> *"I think passion is the key thing and believing that solving the problem, passion for solving the problem reading well and bringing something, adding value to the market to the world basically. Doing something good and being recognized for it. Rewarded for it is the reason we do it."*

The above quote clearly highlights how much passion can impact the start-ups success. It is clear how much of an impact passion and motivation bring to the start-up team to achieve success. Passion and motivation were not captured with the initial literature review but found to be having a critical impact on the success of the start-ups in Sri Lanka.

Communication

Another factor found within this research was focused around communication and the general relationship between the founders. From the many successful start-ups that the study focused; only one was founded by a single founder. When inquired about the founders' relationship and overall interaction quality, all of the founders expressed extremely good relationships with their fellow founding team.

> *"Others were younger to me and we were like brothers. That bond continues till today and I cannot remember any major disagreements."*

The relationship was extremely good since most of the founders were from the IT industry, software engineers with a similar background or were good friends. For the question why does the founding team need to have good communication between them? Mueller and Gemünden (2009) explain that having good interactions within the founding team can significantly increase the ventures performance. Task coordination, mutual support and sharing the right information among each other have made a huge impact on the success of the start-up. When following this up with the current study it was evident that this is the case in most start-ups.

Founding team divides the operations among themselves and a breakdown in the relationship with any two of these founders will have a major impact on the start-up. One of the interviewees said:

> "There was myself the CEO, XXX the CTO and XXX the CO and XXX who was our CMO."

What this study realized is at the start-up stage a major disagreement and breakdown in communication will handicap the start-up. A major business that is already established, can easily manage this since there are already defined functions, job roles and even employees to carry out the day-to-day operations. But for a start-up

this is not the case founders constantly took responsibility to roles outside their domain to push the start-up to its eventual success.

Marketing Experience

Good communication among each other has shown successful marketing management within the startup (Mueller and Gemünden, 2009). As Song et al. (2008) explains having exposure to marketing related activities within the founding team had a positive impact when starting a tech start-up. Within this study the researcher strived to get details on previous experience as a marketer before the start-up stage. Interestingly all of the founding team members were from an engineering background, and were not exposed to the field of marketing. The need for marketing people was obvious as the following came up at an interview:

> *"I think there should have been more marketing oriented people earlier on. It helps and it was essential. Our thinking was more into engineering rather than marketers."*

Out of the discussions the researcher had most of the interviewees expressed the need for marketing in the early stages of the start-up life cycle. Start-ups were generally started by founders with engineering backgrounds and lack of marketing knowledge was a distinct disadvantage. With all cases expenditure and spending was mostly on research and development. But, when the product was ready, the marketing activities had to begin. The study found that marketing experience is essential for any entrepreneur and having marketing experience in the founding team can greatly enhance the rate of survival of the start-up.

Focus

The study also focused on many other aspects of the founders that contributed to the success of a start-up. During the interviews "focus of the founders and the start-up" were highlighted as one of the key success factors.

> *"We didn't want to do too many things. Focus was the key as we were very, very focused on what we wanted to do and was not distracted on other things. We only wanted to focus on our strengths"*

With the information analyzed from these individuals it was evident they were focusing on building fantastic software. Whatever the obstacles that was in their way they focused on the problem at hand and came out on top. There were many routes taken by these individuals but in the end they were highly focused on what they wanted. Further analysis into this shows what they did to stay focused.

> *"They [Angel Investors] will help you with finances since you have to have money to basically operate. So you don't have to do service to pay your bills and you can focus on your product, get it to the market and so on."*

Most of the participants concentrated or focused their energy on the target market they had. Hence, the study can conclude that focus on innovation, the target market and various operations that can get the start-up through its initial stages are important for the success of the start-up.

Planning

During the study another key factor that was discussed was planning. It was clear from all the input that was collected from the interviews that proper planning can make the difference in the entrepreneurial landscape. When starting a tech company the main focus should be to have a proper execution plan for the start-up.

"Today there are lots of things to do and immense amount of competition. If you start something no sooner another person can start the same thing and ideas are cheaply available. So the only way a start-up can succeed in today's world is to have a fantastic execution plan. You can have the best idea and the best finances. But if you don't have an execution plan you're not going to win. You need to have super-fast execution to succeed in today's world. Whatever you do someone else will outsmart you since today the market is global. But today if you do not innovate and put out a product that is not superior, anyone can come up with a product and take over your market share. You have to have a superb execution plan. That is the key element to succeed."

As the study shows an exceptional execution plan is the key for success in today's world. Planning is crucial in any industry, but it mostly affects the IT industry as the barrier for entry is so low and anyone with an idea and finances can start a company. There have been numerous failures in start-ups that the participants know of that never materialized to any venture and the key thing was they did not have a proper plan on where they were going. Creating and innovative product is not going to bring the entrepreneur success. But, planning and executing tasks according to the plan can help make the difference in success or failure.

A proper execution plan can give an entrepreneur proper goals and milestone that they need to achieve. Following this plan they would be able to identify what is weak and what is strong in the start-up and adjust accordingly. Furthermore, as the researcher found plans might change during the course of the entrepreneurial venture but the objectives will not change.

"But, you must not jump into it [tech start-up]. You have to plan it out. So this how I'm going to do this. This is my plan. You will change your plan during the course but at least you have a certain set of milestone, guidelines you put in place that you will actually strive to achieve your objectives."

It was evident that there is a high impact on the success of a start-up when initial planning and execution was done according to the plan. This was highlighted as a critical factor during the interviews and can be considered a critical success factor.

Throughout the study there were factors related to the founders that were considered important for the success of a start-up in Sri Lanka. Within this section the study discussed industry experience, prior start-up experience and learning, motivation and passion, communication, marketing experience, focus, and planning. Industry experience was crucial as it gave the founders the background and knowledge of the industry that they would eventually strive to build their venture. Planning was a key component in the start-up phase as that can give a roadmap or a check list of tasks that needs to be done. All the while re-evaluating the progress and making necessary changes. Within the start-up phase it was important to minimize errors so as to survive and planning can reduce this considerably. Prior startup experience was a factor not many founders had but it was clear that all of them made mistakes and learned from those mistakes to get them where they are now.

Motivation and passion were considered the driving forces for most founders as they continuously struggled to get their start-up off the ground. Marketing experience was a factor none of them had experience with but, during their start-up phase it was evident how much of an impact it made when the start-up needed to generate cash to survive. Finally, communication and focus were two factors that were important in the start-up phase to move the company forward without being distracted.

Out of these seven factors industry experience and planning were considered crucial factors for the success of start-ups in Sri Lanka. While other factors are just as crucial for the success of the startup there was a clear indication that without industry experience and planning the start-up phase would be much more of a struggle.

4.2.2. Innovation and R&D

Innovation

Innovation and innovative products are the reason start-ups keep surviving. While entering a new industry, new technology ventures should concentrate and understand their ultimate performance. Thus, observing that start-ups should drive innovation to survive in the technological industry (Bayus and Agarwal, 2007). From the data gathered through numerous interviews and after analyzing these data, innovation and innovative thinking is seen at the forefront of each successful organization.

The technological industry changes each day with the introduction of new technologies, tools, and methods. Changes such as this are not easy to manage for a traditional enterprise such as a manufacturing firm. If a new technology is available, the manufacturing firm can still operate for few years before upgrading. But, if a tech company follows that they will be so far behind there is no coming back.

> *"The industry itself was fast growing. As I would say this is the fastest growing, changing and most dynamic industry in the world. So we had to keep pace with the challenges and changes in the industry. So those are the challenges we faced since we could not stick to a certain framework when doing our business. When the world was changing and the technology was changing. We also had to change to adapt those changes into our business and our visions and our plans. So we thought to change rapidly to those changes and then brining in new technologies while understanding market trends and then accumulation of knowledge and making expertise so those were the challenges we faced."*

Innovation became a critical factor for any organization. Innovative products have a way of attracting the market since it is new, fresh and never before seen in the domain.

Therefore, The researcher also studied about, the actual outcome of innovation in the start-up stages. One of the participants said:

> *"Innovation was everything, since without innovation and something that is different from what is there is in the market we wouldn't have mattered. Since there was nothing new and no reason for us to exist. There was nothing in the market that did what we did and was basically the reason we exist and we continue to do new things since we are a smaller company and others have power, budgets and smaller people can only do make better stuff or innovate that other can't match and carry on."*

The answer was very clear. In order to exist, start-ups need to innovate. There can be well-known brands that offer these products, and most of the time corporate, SMB's and individuals prefer to use these products than from unknown entities. Through innovation new start-ups can take the edge over big corporate companies with massive budgets and bring in innovative products to the market. As Hyytinen et al. (2015) says younger firms may benefit immensely from the opportunities created by innovativeness due to their less rigid routines and greater flexibility. Big companies will take time to put out some features but through start-ups this should be possible with minimum time. Innovation will capture the market for the company and keeping innovation going within the start-up is the key to retaining the market.

Innovation is the fact that most start-ups today are still in operation. Without innovation these companies would have closed down and gone out of business. A Good example of this was captured in one of the interviews:

> *"When we built the Sinhala fonts they got pirated. We thought that was the end. It was like a funeral at office since these were getting pirated and then how are we going to make money?"*

What they did was innovate:

"We needed to innovate without even knowing the word "innovation". So we introduced a spell checker, Tamil fonts, find and replace thesaurus, etc. so people always wanted the newest version and when we moved into HR same thing we did. Whatever the competitor had we came up with something better. At the time there were client-server applications so we came into the market with a web-based HR application. People loved it and bought it. So, we are used to continually differentiating the product and innovating. Later on realized this is called innovation. Then we did a lot of innovation to bring some brilliant software."

The study focused on innovation came out with some inspiring stories. Through the journey of an entrepreneur in technology, it is vital to adopt innovative thinking and innovation in the start-up to succeed. The industry had become global with Internet and social media becoming more and more influential. Innovation is not just a word used for development of software; it is now applicable for all operations of the start-up. Product development, marketing, sales, recruitment, and even the online presence of the start-up needs to be innovative to become successful. This is what a particular participant had to say regarding innovation within the start-ups;

"You have got to be innovative. Not only in their products but also in everything what they do. they go to be innovative I would say everything means how they run their business, administration setup, management control within the organization how they make proposals to their clients, how they treat theirs, look after clients, how they design their customer service programs and how they eat and grind everything they got to be innovative in everything they do. So without the innovation component there's only a little anyone can do."

Innovation is key for the success of the start-up and without innovating the chances of success is nonexistent. Consumer will always want the best of anything and it is

no different to the technology industry. Innovation is one of the key critical success factors found within this study.

R&D Investment

Innovation requires a certain level of research and development. R&D costs are the most common and most expensive investment for a start-up. Without developing the product or project the start-up would not make any income to sustain its operations. Sri Lankan labor costs are cheaper than many countries in the world and it is quite an advantage for start-ups coming through. Ganotakis and Love (2011) stated investing in R&D is essential for new technology ventures to guarantee high success rates. When considering export market for technology, having strong internal R&D positively supports export markets. But, this does not necessarily mean the export intensity will increase. Therefore, the research inquired into the amount of R&D investment of the start-ups:

> *"R&D is the majority expenses since most of the team are engineers. We were spending 100% of our available resources on R&D. We need to improve the product since we are a product centric company."*

This was the case for most of the participants as these were tech companies into high tech development. But, advantage of being in Sri Lanka was evident. With the labor costs being low comparatively, the start-ups were able to last longer with a relatively smaller budget than big corporate.

> *"We were in Sri Lanka which was cheaper for us to operate compared to our competitors who were spending a lot of money on engineers but we spent a little with engineers (as labor is cheap) so we could last longer with a little bit of money to run the company."*

The study was showing that 100% investment on R&D was the way to successfully get through the start-up stage. But, this was wrong and further inquiry into this showed why. Building innovative software was where the R&D investment was aiming for, but when it comes to selling those products marketing plays a major role.

> *"We wouldn't have changed in the initial stages but say after about 1 year in the market knowing the product is working we could have spent more on marketing. so we would have spending would be initial would be 100% of R&D and we would have brought in at least 30% (on marketing) after we launched the product and got positive feedback from the market and things got going we would have brought it to about 30-40% would have been a good spending on marketing."*

It was evident that during inception of the start-up investing should be solely on R&D, but as the product get close to launch or once just launched considerable investment is required in marketing/branding

Within this section innovation and R&D investment was analyzed and it was evident that innovation is critical for the success of the start-up. Managing R&D investment efficiently was found to be factors that can help a start-up survive the initial stages.

4.2.3. Industry and Market

Analysis of the industry and market at the time of the start-up was another area this study focused on. The IT industry is a dynamic industry where change is normal, new technologies and newer versions of current technologies are being developed and released very rapidly. There were multiple topics that came under this category and some of them include competition, competition intensity, market scope, marketing intensity, customer orientation, networking, credibility, recognition, brand, and multi-industry pairings.

Customer Orientation

Customer orientation was an important aspect when it comes to start-ups. Any entrepreneurial venture strives to solve an issue that needs a solution. While innovation is the driving factor for this kind of a solution, developing software that only the development team can use is unacceptable. The developed product should be customer oriented to suite any customer, or in the worst possible scenario should be suitable for most of the customers in the market which requires that software. One such example was found during an interview:

> *"Nothing was there [in the market] so much. So, we build a prototype thing that seem to get some good feedback"*

Based on the feedback from the customer the start-up did some tweaking and came out with an improved product. Hakala and Kohtamäk (2011) state that technology ventures should serve shape and create their products that meet both current customer needs and create new opportunities. Furthermore, regardless of how innovative or advanced a particular software program is, if the usability aspects are not available then customers will be reluctant to try it. The main fact that came through the analysis was that even though customer orientation is not as important as some of the other factors discussed, it is still useful to follow.

Competition

Competition within the market was a driving factor for start-up success as it kept the start-ups competing for the market share. When creating innovative software it was observed that the participants started getting into the market and along the way competition came in. Intensity of the competition has grown ever since, and today it is quite easier to build software. As the barrier for entry is so low, it has grown the intensity of competition. This increased competition to get mind share of the consumer for a particular product has given start-ups many obstacles in terms of

competition. The interviews provided some insights on to the competition then and how it changed with time:

> *"Now it is more competitive and easier to build software now and more competitors and sit's harder to get mind share since there are so many people in the market."*

Intense competition means the start-ups need to stay ahead of the rest to succeed. This does not necessarily mean competition within start-ups is growing but also competition with giants in the industry. A common theme that was observed within this study was that there was no real competition when the start-ups took off in the early stages and they had to penetrate the market with innovative solutions that were not in the market at that time. This suggests that a start-up should look for a gap within the social paradigm (i.e., the world) and address that with an innovative solution. When approaching the market with a solution that is already available, the study shows innovation helps and staying ahead of the competition and is the only way to survive competition. As porter (2000) points out, if rivalry is fierce, competitors are trying to steal profit and market share from one another. Also, competition is dynamic and rests on innovation and the search for strategic differences.

This is not a bad thing for the start-up or the industry and market. The study shows that because there was so intense competition between the competitors in the industry innovation played a major part in shaping the way the start-ups are today. If looked at from a neutrals point of view, this brought in innovative, easy to use (customer oriented) software to the market.

Market Scope

When looking to enter the market as a start-up there were few things to consider. Interview participants mentioned that they had a good idea of what kind of a market

or market scope they were targeting. Having a defined market is essential not only for start-ups but also for any company in general. The participants showcased this focus on a market where they had a defined scope:

> *"So we saw that there was a need in the market which was not full filled by anybody. So we focused on creating software for HR."*

Furthermore,

> *"Essentially our target market was corporate giants. Especially banks like private sector banks and foreign banks."*

And further evidence as,

> *"As we progressed we identified the target market. Government, lawyers, publishers and universities and we had a focused strategy to sell to these individuals."*

These start-ups had a market scope which they would serve and consciously focused on satisfying the target market rather than getting distracted with other opportunities. Having a defined market scope helped the start-ups succeed and become known in the industry.

Defined scope can also help the marketing efforts of the start-up. It was observed that marketing intensity also played a part in the eventual success of the start-ups. Marketing is a key element in the entrepreneurial journey that cannot be avoided.

> *"We did huge direct marketing campaigns with flyers and out of this 5%-10% responded. When they respond we somehow sold it to them and they kept on buying."*

All of the participants in this study did not have marketing experience; hence, had to resort to learning from mistakes or hiring from outside to do marketing.

"I was very young and I hired a guy who was doing marketing and he saw our product and said we need to brand it. So, we created a brand. Then we thought of doing a big event after booking a big hotel we invited all these ministries and lawyers and that really helped us generate more sales."

Brand

The major factor that was identified from this part of the interview was the brand. The study took this factor and used this with the marketing factor to take the data collection to a different direction. Brand was considered an important entity in this study, as the word "brand" came up many times during the data collection.

"The benefit right now is we have a brand and we can bank on it to expand and grow our share."

Branding was an important part in start-ups success as it gives the company creditability and reputation. Brand value had become so important in the current market that it has become an icon for any company which competes for mind share. When a consumer uses a service that is offered through a start-up and that consumer is satisfied with the service, he/she will share that information with others. While that just generates word and mouth publicity the main point is they can refer the service with the brand name. Having an established brand can be very advantages for a start-up as they can depend on the brand to get them through to the market. An unknown brand will not be able to penetrate the minds of the corporate world. But an established brand with reputation would easily be able to close the deal on certain requirements of a consumer.

"Our strategy was to use the brand strength of another international conglomerate and then what we did was we used their brand strength to penetrate into the market."

That was a brilliant strategy used by a start-up to get into the corporate world and from their onwards it was their responsibility to create a brand that would distinguish the start-up as a separate entity. The brand value cannot be taken for granted, as the start-up is able to build trust around its brand that will enable them to move into different markets and open up different opportunities to grow. That was found to be critical success factor within this study. As suggested brand can make marketing efforts easier as having an established brand helped the marketing efforts.

Recognition

While brand does give you much needed attention from the market it also provides recognition and credibility. These are some of the success factors identified within this study. It is important to be recognized for the achievements of the start-up as that will help build the brand. During the analysis the researcher discovered that winning awards is not just a part of winning for the sake of winning but to ultimately build a brand that will be trusted, a brand that can be marketed with those awards and a brand that the market knows will keep innovating. So, winning awards and continuously shedding the limelight to the start-up increases the chances of survival. Then the industry know what the start-up offer, the market gets to know what the start-up offers and ultimately build credibility as an innovative start-up.

> *"When you are a small company winning stuff can really shed the limelight on you to be known in the industry. If you do innovative stuff then you become larger than what you are now."*

Each individual strives to be recognized for his /her achievement which is normal and it is what humans do. Building great software and being recognized for the impact it is making is an achievement each entrepreneur wants.

> *"Doing something good and being recognized for it, rewarded for it is the reason we do it."*

Recognition does motivate individuals to achieve more than what they have done. While this is good for the individual it also indirectly influences the start-up as well. Brand and awards will eventually build recognition around the start-up which will in turn get customers.

Credibility

Customers that the start-up acquires through these means should stay with the company, if they are to survive. A phrase emphasized with this study was the ability to keep customers and while doing that building credibility within the start-ups brand. This is paramount as most of the participants pointed out when you get customers you should treat them well and build the brand with the start-ups customers. Building credibility within the industry and market was considered one of the most critical factors that will help a start-up survive.

The study showed that credibility with the start-up or the brand will help get more businesses and help keep the customers who are already onboard. The emphasis that a start-up should give on credibility was clearly described by one of the participants:

> *"Never tarnish their [start-up] credibility since credibility is the one that will finally close the business for them [start-up], don't do anything to downgrade that credibility do everything possible to either maintain or uplift the level of credibility that they [start-up] maintain. So, what I mean by credibility is, that is the forum for them to develop proper networks with reciprocal support where without a networking you can't do business. That is the main thing you need to have. To develop your network it is very essential that you maintain your credibility. Even when you [start-up] are deciding a product and deliver something to a customer, does everything possible to make sure that you do the right thing, deliver the right product so that you maintain and uplift your credibility."*

It is clear that the credibility cannot be built around a start-up at the very early stages. The start-up should strive to build credibility around them with their product, services and overall professionalism. But, for a start-up looking to grow rapidly in the industry and market credibility can do miracles. There are giants in the industry who have built a brand around them, who have gone the entrepreneurial journey or lead the industry in some form. Getting someone such as that onboard can really boost the start-up credentials, may it be advisory capacity or a director.

> *"The fact like people in Venture Capital is on our industry panel helps significantly to bring the credibility. Even with suppliers its phenomenal since some of these suppliers are very large suppliers from UK and us work with very large businesses but they decided to bring us on because of the people we have backing us. It has been a tremendous help."*

Credibility is something a start-up should strive for and just by doing that it will open so many doors. Building credibility within the industry and market can help the start-up with networking.

Networking

Networking is another factor that was identified while analyzing the gathered data. This was used with the other interviews to get a clear idea on how networking can help a start-up with its eventual Quoting success.

> *"So, what I mean by credibility is, that is the forum for them to develop proper networks with reciprocal support where without networking you can't do business. That is the main thing you need to have. To develop your network it is very essential that you maintain your credibility."*

Having networked a start-up can get many doors open which will help the start-up grow rapidly. Having contacts can help the start-up grow faster as it can make things

move faster. If the start-up wants to get into a market which is new to them, they can use networking to find suppliers or even customers with the use of their contacts. Not even getting into markets networking can help a start-up get new customers, new contacts and even get advice on certain aspects of the business.

> *"Venture capitalists brought us not only the advice but also contacts. When we wanted to start new areas of the business we need partners, suppliers, etc. overseas and venture capitalists helped open many doors for that."*

Networking is an important part of any start-up and the study shows that brand, recognition, credibility and networking are all interconnected. Start-ups should act on this and build their brand as this was found to be key success factor.

In the industry and market category the main factors identified were customer orientation, competitor orientation, market scope, brand, recognition, credibility and networking. While it was evident through the study that none of these factors were critical for the success of the start-up. They play a massive role in building it to become successful. It was clear that no one factor is greater than the other but some of these factors combined were found to be quite important. Customer orientation drives start-ups to create new products and services but, focusing on customer orientation alone can see the market flooded with products that do the same functionality. When competitor orientation is taken into account companies strive to differentiate their products from its competition, innovating its offerings not only to service its current customer base but also to gain more market share. The same can be said about brand, recognition, credibility and networking. The start-up needs to brand it or the products in order to differentiate from its competition. Innovative products will eventually get recognized and this in turn creates more opportunities for the start-up. Building credibility and networks is essential for businesses to grow.

4.2.4. Resources

Resources are a major part in any start-up as this will be the backbone of the company. As Fu (2014) states, when the start-up grows rapidly it needs to acquire sufficient resources (capital, talents, etc.) to build solid infrastructure to support its growth. During the study the researcher inquired about the resources the start-up had and how it helped shape the company to what it is now. These included financing, IT workforce, infrastructure, mentoring, alliances, incubators, patents, and university partnerships.

Financial Resources

Financing was considered a crucial factor in the study as financing is required for any start-up. Financing for the start-ups were mainly done through self-financing (bootstrapping), venture capitalists and angel investors. Finances in start-up stage is a delicate matter since the company might not be making enough revenue to operate on its own and expenditure is always high than revenues in the start-up stage. It was evident from the gathered data that managing finances is a critical task that any entrepreneur should master.

When inquiring on how they were financed start-ups had this to say:

> *"When I started this company of course I did not have more than 100,000 in my possession, now we have become more that 5 million turnover company. We did all these things without funds coming from any third party or financial assistance"*

Some start-ups did start with their own money and then when expansion or growth is required they went on to third parties for support:

> *"Initially we financed ourselves putting in our own money that basically got us kick started. Then we raised a small amount of money from angels."*

Third party investors such as venture capitalists and angel investors can help the start-up grow rapidly, helping them when expanding to a whole different market.

> *"Venture capital has helped us significantly expand globally we have now from zero overseas clients to hundreds of overseas clients. Venture capital money helped us do that."*

From this it is evident that financing can be achieved through various sources to start, to expand or to grow the business. It is worth noting that in the start-up stage financing through traditional institutions were practically impossible. As a start-up they will not have traditional assets such as building, land and machinery. What they will have are people and ideas to build innovative software. Traditional institutions or banks would ask for collateral in order to provide capital which is not possible for start-ups at that stage.

The best way to get financed is to invest the founders own money but not every entrepreneur could afford to do this. But the important fact is managing your finances properly, if investing founders own money:

> *"Sadly we didn't have outside finance. I didn't even know how to approach VCs and even banks were not that interested. Due to that I saved a lot of money didn't take much of a salary and rest of the money we reinvested and saved a lot of money and that cash was the money we bankrolled to run next year's operations. Even today we are privately held. So from day one we were generating profit from operations and the salaries were low. When you manage your expenses well we have money to pay bonuses and treat your employees well they stay with you."*

Venture Capital (VC) route was considered the fastest way to get financed when the entrepreneur has an idea that he/she want to materialize. VCs, if the idea is good and if the entrepreneur has a good execution plan, VCs will back the start-up with finances, advice and even contacts. They will take a gamble with the start-up and

finance it. But, as an entrepreneur, doing research, finding the right investor is important.

When opting to go with VCs it comes with certain conditions. While financing is critical in start-up stage, it is important for the entrepreneur to carefully pick a suitable VC. VCs will try to push in their ideas and try deciding things that is within the start-ups scope of operations. Managing third-party investors and carefully taking their advice is an important skill an entrepreneur should possess.

> *"Having external investors there are good and bad. They will help you with finance since you have to have money to basically operate. But sometimes not all the decisions they try to push are correct. Since they are not in the operation of the business they are just external observers. So there is good and bad."*

Financing should be managed well in order for a start-up to succeed. Good financial management can lead to faster growth of the start-up. Founders had gone to amazing lengths to make sure that the start-up was running smoothly. For example, one said:

> *"We knew we were a small company and we never took our profits into our pockets. We reinvested all the profits to the company."*

IT workforce

Another critical resource that any start-up strives to have is a capable, competent and passionate workforce. Throughout the study emphasis was given to find how much of an impact did the initial IT workforce or software engineers have on the company. As these were start-ups initial number of engineers ranged from two to five employees. When considering their impact one of the interviewees said:

> *"We initially had a good team. People were good and committed and believed that we can do it. That was the first success factor."*

Throughout the study employees had played a major part in the success of the start-up. Within the start-up stages engineers were committed built some brilliant software. The tooling that the current engineers have were not present in that era and the internet was not filled with the information that it has right now. Most of the research and development effort was done with the resources available at the time. Having a talented IT workforce is essential to any organization and having skilled employees in a technological venture is paramount to its success (Jennex et al., 2004).

Mentors

Mentors and mentoring was another key area the research focused on. Mentors did play a massive role in getting some start-ups off the ground. They bring in a wealth of experience and knowledge to the start-up and at times help accelerate the progress.

> *"They will give external feedback saying this is the right path, you need to run faster and get things done faster and that is good."*

Growing from start-up stages is not an easy task and having some advice on how it can be done can be beneficial for the start-up. Mentors help groom the entrepreneur, they will help the start-up to assess where they are and where they need to grow as seasoned giants in the industry what they can offer is invaluable.

> *"There were few mentors that helped us make right decisions at different points and we would bounce idea off them and so on. So, that helped."*

Furthermore, the learning that a start-up can get from mentors was highlighted as:

> *"Importantly we got fantastic advice from our investors. Once we raised the funding almost at a daily basis I had access to these VCs via email, phone and we would talk for almost about a month then slowly scheduled weekly then*

monthly. Now we understand what it takes to really play in a global environment."

Mentors can help a business grow rapidly and provide expertise on areas the start-up is lacking. Most of the participants did not have marketing experience when actually starting so they opted for mentors to help them understand the concepts, strategies in marketing.

Alliances

Alliances were another part of the analysis that the researcher focused on. Unlike networking, alliances help the company to establish themselves and virtually grow out of the start-up phase to the growth phase. There were two instances in the data gathered that stresses the critical role played by alliances in shaping the start-up.

"When we wanted to start new areas of the business we need partners, suppliers, etc. overseas and VCs helped open many doors for that."

Alliances can help the start-up grow and expand its reach in the industry and the study shows alliances are useful for the growth and expansion of the start-up. Perez et al. (2013) mentioned that when alliances are created joint learning is possible which will create new opportunities and knowledge that is beneficial for start-ups.
University partnerships can be called as an alliance. Universities keep producing engineers that start-ups require. Having a steady source of specialized talent available via universities is essential for start-ups. Universities get the benefit of being recognized for the rate of employment that is obtained by their graduates as start-ups keep getting fresh employees for their operations.

"Working with universities very closely was the biggest achievement we had by getting people from universities. By establishing relationships with universities we were able to get good graduates."

Infrastructure

When it comes to resources for the start-up infrastructure requires a huge mention. Without infrastructure much of the operations would be impossible. Most of the start-ups said that the infrastructure while they were a start-up was poor with comparison in today's world.

> *"Servers and those things I paid $1000 for a server a month when I started but without many users and that was stupid. Then AWS came in and lowered the cost and the cost for tech infrastructure has gone down tremendously and it's very cheap now."*

While the study emphasized on the infrastructure being a key element in the success of the start-up, participants were not much bothered about this factor.

> *"Then workspace and stuff we got the office and got things done and those things don't matter so much. Good Internet matter but that's always bad here."*

Infrastructure while being essential was not a defining factor for the success of the start-ups. Incubators or start-up accelerators were another part of the inquiry but the participants never had the opportunity to be a part of these ecosystems as there were no incubators at the time of their inception as a start-up. But the requirement of incubators and start-up accelerators were heavily stressed.

> *"One of the key things that should happen is a proper start-up accelerator we need to have a solid accelerator to help people. If there is an accelerator you can go there and get financing, mentoring, networking and get the initial support required. So this is something should happen which will have local funding plus serious VCs."*

The most critical factor found within resources category was financial resources. Financial resources were found to be a critical factor since without it start-up would not be possible. Mentors, IT workforce and alliances while not being critical factors were found to contribute immensely towards the success of the start-ups. Finally, Infrastructure, while important was not found to be critical for the success of the start-up.

4.2.5. Government

Government support for start-ups in Sri Lanka was nonexistent as per the data gathered as none of the participants showcased any help from the government to help them in their start-up endeavors. While that was the output of that gathered data Jayasena and Nanayakkara (2012) states, Peaceful environment in a country attracts foreign investors. Local entrepreneurs can tie up with them to start new businesses. Reputation of the country plays a big role when a firm competes in overseas markets. While this can be said about the current situation in Sri Lanka most of the start-ups that were focused on with this study was started during the civil war which went on for three decades before ending in 2009. Therefore, we can conclude that the Government did not make any major contribution for the start-ups in Sri Lanka.

4.3. Hypothesis Testing

While hypothesis were developed for this study there were no statistical analysis conducted to make sure these were accurate. Grounded theory was used to analyze the gathered data and arrive at conclusions. While hypothesis testing is not common in qualitative studies the research strives to test the created hypothesis with the information that was analyzed in above section.

Hypothesis 1

Industry experience of founders was found to have a direct influence in building a successful start-up. None of the founders studied came without industry experience and having that experience was the reason they started the company. Therefore, the null hypothesis ($H1_0$) is rejected and alternative hypothesis ($H1_A$) is substantiated. This means having industry experience is essential for an entrepreneur who is striving to start a successful tech start-up in Sri Lanka.

Hypothesis 2

Marketing experience of the founders was not found to be a directly influencing the success of the start-up. Non of the participant in this study had a marketing background and none had any experience in marketing even though they admitted this could be a factor that would have helped them achieve more. The study did not show any indication that marketing experience is critical for the success of the start-up. Therefore, the alternative hypothesis ($H2_A$) is rejected and null hypothesis ($H2_0$) is substantiated. This means marketing experience is not essential for an entrepreneur who wants to start a successful tech start-up in Sri Lanka.

Hypothesis 3

Prior start-up experience of the founders was not found to be a defining factor for the success of the start-up. Although some of the participants had prior start-up experience most of them started on the first attempt. But, the research shows that there were lots of mistakes involved before becoming successful. The hypothesis specifically mentions prior start-up experience which was found not to be a critical success factor. Therefore, the alternative hypothesis ($H3_A$) is rejected and null hypothesis ($H3_0$) is substantiated. This means prior start-up experience is not essential for an entrepreneur who wants to start a successful tech start-up in Sri Lanka.

Hypothesis 4

Communication between the founding team was found to be a critical factor when running the start-up. Founding team had different roles to play and communication was paramount for operations to run smoothly. Only a single participant started the start-up as a single founder hence communication aspect does not apply. Therefore, the null hypothesis ($H4_0$) is rejected and alternative hypothesis ($H4_A$) is substantiated. This means communication between the founders is essential for successfully starting a tech start-up in Sri Lanka.

Hypothesis 5

Innovativeness of the start-up was found to be the most critical factor when running a start-up. Every participant mentioned innovation was the most critical success factor because that was what kept them in business. Therefore, the null hypothesis ($H5_0$) is rejected and alternative hypothesis ($H5_A$) is substantiated. This means innovation is a critical success factor for tech start-ups in Sri Lanka.

Hypothesis 6

High research and development investment was found to be a success factor for start-ups. Start-up stages the highest expenditure is on research and development. Throughout the study participants mentioned they would have spent on research and development on start-up stages to get the product into the market. Therefore, the null hypothesis ($H6_0$) is rejected and alternative hypothesis ($H6_A$) is substantiated. Which means research and development investment is required in the start-up stages of a tech start-up in Sri Lanka.

Hypothesis 7

Competition and competitor intensity was not found to have an impact on the start-up. Throughout the research participants mentioned the need to innovate and be ahead of the rest with their product. It was crucial or the competition can take over the market eventually taking the market share of the start-up. That in turn helped companies innovate and create better software. But, there was not enough evidence to suggest that competition directly affects the success of the start-up. Therefore, the alternative hypothesis ($H7_A$) is rejected and null hypothesis ($H7_0$) is substantiated. This means competition and competitor intensity do not have a major impact on the success of tech start-ups in Sri Lanka.

Hypothesis 8

Market scope was found to be a success factor for start-ups in Sri Lanka. Participants of the study emphasized, as a start-up the company needs to focus on a certain market before expanding into other areas. This was evident in the analysis. Therefore, the null hypothesis ($H8_0$) is rejected and alternative hypothesis ($H8_A$) is substantiated. Which means having a defined market scope is essential for the tech start-up in Sri Lanka.

Hypothesis 9

Marketing intensity was not found as a factor that is critical for the success of the start-up. Study focused on this aspect but the analysis shows no hard evidence on how marketing intensity would help the start-up to succeed. Therefore, the alternative hypothesis ($H9_A$) is rejected and null hypothesis ($H9_0$) is substantiated. This means marketing intensity at the start-up stage has no significant effect on the start-up.

Hypothesis 10

Customer orientation was found to be a factor that would contribute to the success of the start-up. When start-ups create products or services they should be customer oriented. The analysis shows that customer feedback and requirement were an integral part in the success of a start-up. Therefore, the null hypothesis ($H10_0$) is rejected and alternative hypothesis ($H10_A$) is substantiated. This means customer orientation is essential for tech start-ups in Sri Lanka.

Hypothesis 11

Financial resources were found to be a critical factor for success of start-ups. R&D, marketing and operational expenditure, finances for expanding on the market and growth require financing. The analysis shows different methods were used for financing the start-ups. Therefore, the null hypothesis ($H11_0$) is rejected and alternative hypothesis ($H11_A$) is substantiated. This means financial resources were found to be a critical success factor for start-ups in Sri Lanka.

Hypothesis 12

IT workforce of the start-up was found to be a major factor when it comes to the success of the start-up. Analysis shows the initial team played a major role in getting the start-ups off the ground and running. Therefore, the null hypothesis ($H12_0$) is rejected and alternative hypothesis ($H12_A$) is substantiated. This means IT workforce of a start-up is a critical requirement for the success of a start-up in Sri Lanka.

Hypothesis 13

R&D alliances were not found to be a contributing factor for the success of start-ups. The analysis did not show any relevant data that could verify this as a crucial factor. Therefore, the alternative hypothesis ($H13_A$) is rejected and null hypothesis ($H13_0$) is

substantiated. This means R&D alliances were not found to be a critical success factor for tech start-ups in Sri Lanka.

Hypothesis 14

Mentors were found to be a factor that would help start-up's success. Throughout the study many aspects that mentors bring to the start-up were observed. Expertise, contacts, credibility, etc., were some of these traits. But, there were instances no mentoring was required and the start-up was still successful. While mentors are a great resource to have the start-up was able to function without them. Therefore, ($H14_A$) is rejected and null hypothesis ($H14_0$) is substantiated. This means mentors are not a critical success factor for tech start-ups in Sri Lanka.

Hypothesis 15

While the researcher did find relationships with the start-ups and universities there was no hard evidence to suggest university partnerships are critical for start-up's success. Therefore, ($H15_A$) is rejected and null hypothesis ($H15_0$) is substantiated. This means university partnerships have no impact on the success of tech start-ups in Sri Lanka.

Hypothesis 16

There was no information regarding patents that were captured or analyzed. Therefore, ($H16_A$) is rejected and null hypothesis ($H16_0$) is substantiated. This means patents have no impact on the success of tech start-ups in Sri Lanka.

Hypothesis 17

Infrastructure is very important for a start-up. It provides the backbone for the start-up to develop and deploy their product or service. During the study there was no evidence that infrastructure having direct role in the success of the start-up. Therefore, ($H17_A$) is rejected and null hypothesis ($H17_0$) is substantiated. This means infrastructure does not have a direct impact on the success of a tech start-up in Sri Lanka.

Hypothesis 18

Government and government policies were not found as critical success factors for start-ups. Throughout the study government policy related information was not required and participants did not have any government support. Therefore, ($H18_A$) is rejected and null hypothesis ($H18_0$) is substantiated. This means government and government policies do not have any impact on the success of tech start-ups in Sri Lanka.

4.4. Summary

This chapter analyzed the collected data through the use of grounded theory. The gathered data were analyzed through qualitative data analysis software and then the analysis was concluded.

This chapter included how the analysis was done through the use of grounded theory. How coding, categorizing and memo writing was incorporated aligning with grounded theory principals. Next, the discussion evolves around the analysis in detail after breaking them down to categories and codes. Hypothesis that was generated in chapter 3 were tested in the later stages of the discussion with evidence and conclusion.

In the next chapter the study discusses the findings before concluding the outcome of this study. Furthermore, recommendation for future studies and implications of the current study will be discussed.

5. CONCLUSION AND RECOMENDATIONS

This chapter provides the conclusion and recommendation of the analysis which was done through the use of grounded theory. Section 5.1 covers the research implications and concluding remarks of the study with findings and section 5.2 covers recommendations for future research in this area. Finally in section 5.3 concluding remarks of the study and research objectives were covered.

5.1. Research Implications

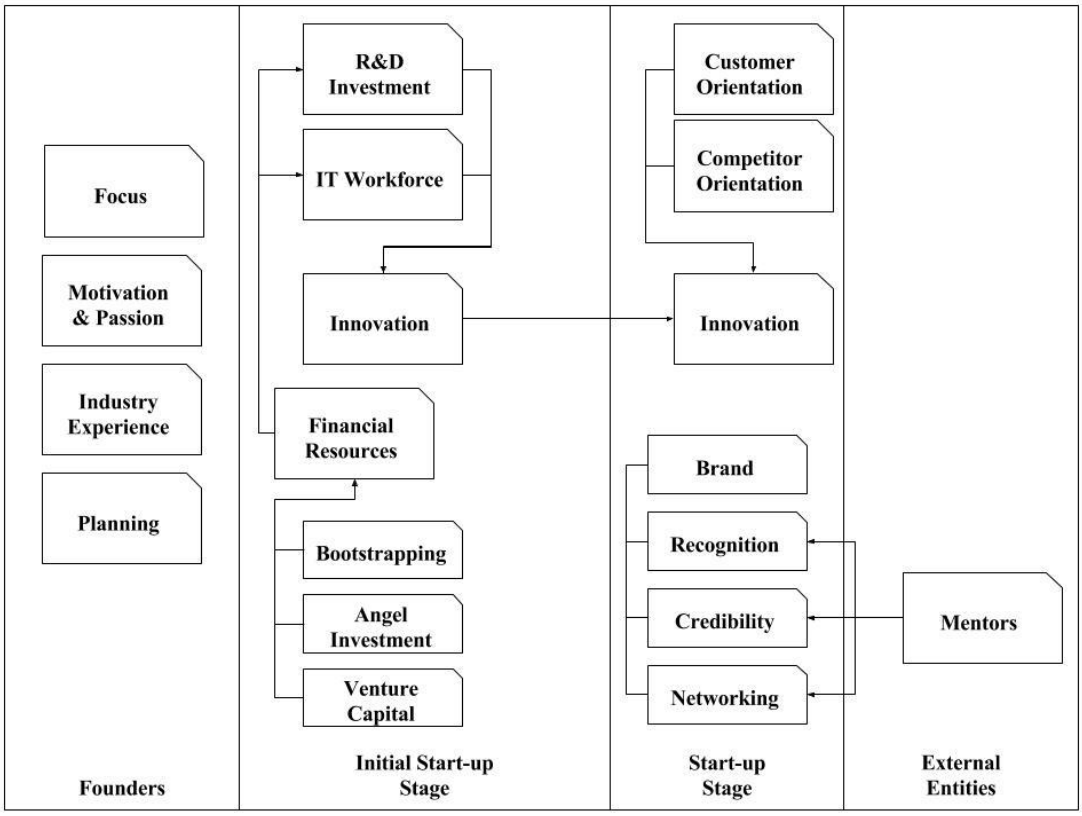

Figure 5.1 - Critical success factors for a tech start-up

The purpose of the current study was to evaluate and identify the most critical success factors that help tech start-ups succeed in Sri Lanka. Designed as a qualitative study, the research went on to gather information through interviews and other available sources. Throughout this research grounded theory was incorporated to gather, analyze and create knowledge on the study at hand. The study did look into the available literature to find some factors that would be relevant. Using that information as a guide interviews were conducted, the interview transcripts were transcribed to be analyzed. Using grounded theory methodology transcripts were coded and categorized according to the codes and analyzed to find relationships between these codes and categories.

Based on the present study results, it was clear that all the founders had industry experience and had been in the industry for some time before going into entrepreneurship. As McDougall et al. (2003) states the expertise within the founding team would be imperative for the success of the venture. Having been in the industry the founding team were very comfortable with each other as fellow engineers and the interests were almost the same and that helped them bond much easier as a team. Communication between the founding team was another factor that was found to be critical as the founding team divided several operations in the company among them and communication was essential to run things smoothly. Coming from a tech background and having industry experience helped these individuals communicate better leading to the success of their start-ups. Good communication, task coordination, mutual support and sharing the right information among each other in turn have shown successful marketing management (Mueller and Gemünden, 2009). As the study found communication between the founders were excellent in the start-up stages and it is ongoing till now.

The study focused on the founders' passion and focus which was found to be one of the characteristics any start-up should have. Without this there won't be a start-up that goes the distance and becomes successful. There were a lot of passionate people who were ready to jump in and create the next big start-up. There can be many

brilliant ideas, many brilliant concepts and all the finances an entrepreneur would ever need. But, without a proper execution plan all would be in vain. In today's world it is very easy to start a company and build software. But it is important to plan, set of goals and milestones that need to be achieved. The execution should be super-fast and the product should be in the market as soon as possible. If not, any competitor can get this done and capture the market. After that the start-up would be playing a catch-up game where survival rate is very low.

Innovation was the most important factor uncovered in this study. Start-ups exist because of innovation and they continue to innovate to be relevant, to exist. The study showed the start-ups coming into the market with innovative solutions that were unmatched at the time. This gave them the edge over the competition as these were new and exciting. The start-ups kept on innovating and that was the reason they are still operational today. The technological world is an ever changing, dynamic world where the newest, fastest, most user friendly products are more in demand. Without innovation in a start-up there will be no path for them to penetrate the already crowded market. The study shows that the only way a start-up will survive is through innovation and by build something that would make the competitors fall behind. Innovativeness can increase the likelihood of survival. Enhancing the start-ups' market power, reduce the cost of production and allows the creation of dynamic capabilities and absorptive capacity. Younger firms may benefit immensely from the opportunities created by innovativeness due to their less rigid routines and greater flexibility (Hyytinen et al, 2015). But to innovate the start-ups need to spend on R&D.

R&D investment was found to be one of the critical factors for success as a start-up. The research found that all of the founders invested heavily on R&D in order to get the product or service built. Re-investing all of the profits, getting help from third party investors such as venture capitalists and angel investor's a start-up's heavy emphasis on building an innovative product was a key factor for their success. As Hall and Lerner (2010) states start-ups in R&D intensive industries face higher costs

than their larger competitors. But, based in Sri Lanka most of the participants noted the labor costs were far less than the global industry giants. This leaves them with a substantial amount of finances for developing innovative software.

The study went on to explain how market scope helped the success of start-ups. The participants were clear when creating a product that the start-up should directly target a market that they want to serve. Focusing on many different things at a time was very unwise and the study shows that focusing on a market and directly developing a product to that market can help get more consumers to the start-up. Customer oriented start-ups have the edge over this as they have defined a target market and they are serving them. Throughout the study the analysis shows the importance of customer orientations and market scope.

Through the use of grounded theory analysis found that brand or branding is a critical success factor for the success of a start-up. Brand is one of the most important factors since that can be used to differentiate the start-up from the rest of the industry and create a persona under it. Some of the key elements that were discovered through the analysis were recognition, credibility and networking. Brand took the center stage in all these factors. When start-ups create innovative solutions they get recognition and awards for it. As a start-up it is vital that they apply for all the awards available in the industry and try winning as much as possible. Winning and getting recognized is essential to the start-up to build its brand and market. The market gets to know the brand, gain respect and credibility. When the start-up gets recognized it is easier for marketing efforts, as people and corporate entities know the brand and build trust in the brand.

Recognition in the market can get many doors open for the start-up. Regular sales and customers mean the start-up will start growing. While that is the best case for the start-up, maintaining credibility was found to be another critical factor. Becoming a reliable start-up is making its customers trust them and when credibility builds so does contacts. The customers will recommend the start-up to other customers and all the time the start-up would be able to network, create new contacts which will be

useful in their operations. Networking was found to be another critical factor since networking helps the start-up attract business and eventually achieve success.

The study further analyzed the resources and how they impact the success of the start-up. Finances were the most critical factor in this study since money was required to run day to day operations. Study showed there were two ways to fund the start-up 1) self-funded or bootstrapping and 2) through venture capitals or angel investors. It was observed that financial management is an important skill to have as a founder. Successful start-ups have managed to do this successfully. Another factor that came up with the study was mentoring. Although not important mentoring has helped start-ups get through some tough decisions and phases.

Identifying the most critical success factors for tech start-ups in Sri Lanka were the objective of this study and after collecting data, analyzing them with the use of grounded theory the study concludes with the above information. For any entrepreneur who wishes to start a new venture within Sri Lanka many more aspects needs to be developed. One such area the research found that needs to be developed is Sri Lanka to have a good incubator that produces actual start-ups that can go on to build great products. With super-fast infrastructure and execution which is essential for a start-up competing in the global stage.

5.2. Recommendations for future research

Future research should consider the impact incubators are making and what kind of an impact venture capitalists have done. Sri Lanka currently has many venture capitalists that are ready to invest and an incubator system not fully functioning. Research should center on what these venture capitalists are looking for in a start-up in order to invest. It will be interesting as new breed of start-ups grow and become successful they will have seen the impact which was made by venture capitals.

The current research shows how much of an impact innovation had on the start-up. This should also be followed up on to determine how to evaluate these innovative products and its overall impact to the start-up.

Another area of interest are failed start-ups, and why they failed. The current study focused on finding the factors that contributed to the success of successful start-ups. The failures can bring in a whole new paradigm for the current research and can be essential for entrepreneurial researchers. Future research should focus on failures to build on the current model and bring in a different point of view.

5.3 Concluding Remarks

The research problem associated with the present research was:

What are the critical success factors for tech start-ups in Sri Lanka?

In answering this research problem, three research objectives were initiated:

- *Identify the critical success factors affecting new technology start-ups.*

The present study was able to review large amount of literature to find some of the factors that contribute to the success of start-ups. With the analysis done through the use of grounded theory the researcher was able to generate facts and findings that were not captured through the literature. The research finally was able to analyze and present the success factors that helped start-ups grow and become successful.

- *The study will emphasize on the data which will be gathered through interviews with success stories of the Sri Lankan IT industry. With this and information uncovered through the literature review, the most critical factors that shaped the industry as it is today were mapped out.*

The researcher was able to find the factors through the literature and after analyzing data gathered from the interviews was able to map the variables. While some variables were found to be factors that contribute to success others were not found to

have any impact on the success of a start-up.

- *Formulate a model to successfully start a new technology venture.*

The present study formulated steps that can be taken which gives clear guidelines to an entrepreneur who wishes to build a successful start-up, and clearly states the pitfalls that should be avoided along the way.

REFERENCES

Artz, K. W., Norman, P. M., Hatfield, D. E., & Cardinal, L. B. (2010). A longitudinal study of the impact of R&D, patents, and product innovation on firm performance. Journal of Product Innovation Management, 27(5), 725-740.

Atkinson, R. C., & Pelfrey, P. A. (2010). Science and the entrepreneurial university. Center for Studies in Higher Education.

Atuahene-Gima, K., Li, H., & De Luca, L. M. (2006). The contingent value of marketing strategy innovativeness for product development performance in Chinese new technology ventures. Industrial Marketing Management, 35(3), 359-372.

Barr, A., &Tessler, S. (1999). Software Entrepreneurism in Korea. Talk and slides presented at the Asia-Pacific Research Center, Stanford University.

Bayus, B. L., & Agarwal, R. (2007). The role of pre-entry experience, entry timing, and product technology strategies in explaining firm survival. Management Science, 53(12), 1887-1902.

Bertoni, F., Colombo, M. G., & Grilli, L. (2011). Venture capital financing and the growth of high-tech start-ups: Disentangling treatment from selection effects. Research Policy, 40(7), 1028-1043.

Blazenko, G. W., Pavlov, A. D., & Eddy-Sumeke, F. (2012). New venture start-ups and technological innovation. International Journal of Managerial Finance,8(1), 4-35.

Brander, J. A., Du, Q., & Hellmann, T. (2014). The Effects of Government-Sponsored Venture Capital: International Evidence Review of Finance, rfu009.

Carmel, E. (2003). The new software exporting nations: success factors. The Electronic Journal of Information Systems in Developing Countries, 13.

Carmel, E., & Tjia, P. (2005). Offshoring information technology: Sourcing and outsourcing to a global workforce. Cambridge University Press.

Charmaz, K. (2006). Constructing grounded theory: A practical guide through qualitative analysis (Introducing Qualitative Methods Series).

Chen, C. J. (2009). Technology commercialization, incubator and venture capital, and new venture performance. Journal of Business Research, 62(1), 93-103.

Chorev, S., & Anderson, A. R. (2006). Success in Israeli high-tech start-ups; Critical factors and process. Technovation, 26(2), 162-174.

Ciavarella, M. A., Buchholtz, A. K., Riordan, C. M., Gatewood, R. D., & Stokes, G. S. (2004). The Big Five and venture survival: Is there a linkage?. Journal of Business Venturing, 19(4), 465-483.

Cockburn, I. M., & MacGarvie, M. J. (2009). Patents, Thickets and the Financing of Early-Stage Firms: Evidence from the Software Industry. Journal of Economics & Management Strategy, 18(3), 729-773.

Colombo, M. G., & Grilli, L. (2007). Funding gaps? Access to bank loans by high-tech start-ups. Small Business Economics, 29(1-2), 25-46.

Damodaran, A. (2009). Valuing young, start-up and growth companies: estimation issues and valuation challenges. Available at SSRN 1418687.

Deeds, D. L. (2001). The role of R&D intensity, technical development and absorptive capacity in creating entrepreneurial wealth in high technology start-ups. Journal of Engineering and Technology Management, 18(1), 29-47.

Department of Census and Statistics, Sri Lanka. (2013). 2013 Annual National Accounts Report of Department of Census and Statistics. retrieved from http://www.statistics.gov.lk/national_accounts/Press%20Release/2013%20ANNUAL.pdf

Fu, Y. (2014). The roles of finance at different growth stages of startups (Doctoral dissertation, Massachusetts Institute of Technology).

Ganotakis, P., & Love, J. H. (2011). R&D, product innovation, and exporting: evidence from UK new technology based firms. Oxford Economic Papers, 63(2), 279-306.

Gartner, W. B. (1985). A conceptual framework for describing the phenomenon of new venture creation. Academy of management review, 10(4), 696-706.

Giardino, C., Unterkalmsteiner, M., Paternoster, N., Gorschek, T., &Abrahamsson, P. (2014). What do we know about software development in startups?. Software, IEEE, 31(5), 28-32.

Griffith, E. (2014). Startups are failing because they make products no one wants. Retrieved January 27, 2016, from http://fortune.com/2014/09/25/why-startups-fail-according-to-their-founders/

Hakala, H., & Kohtamäki, M. (2011). Configurations of entrepreneurial-customer- and technology orientation: differences in learning and performance of software companies. International Journal of Entrepreneurial Behavior& Research, 17(1), 64-81.

Hall, B. H., & Lerner, J. (2010). The financing of R&D and innovation. Handbook of the Economics of Innovation, 1, 609-639.

Hofstede, G., Noorderhaven, N. G., Thurik, A. R., Uhlaner, L. M., Wennekers, A. R., &Wildeman, R. E. (2004). Culture's role in entrepreneurship: self-employment out of dissatisfaction. Innovation, entrepreneurship and culture: The interaction between technology, progress and economic growth, 162-203.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. Qualitative health research, 15(9), 1277-1288.

Hutchinson, S. A. (1986). Education and grounded theory. Journal of Thought, 50-68.

Hyytinen, A., Pajarinen, M., & Rouvinen, P. (2015). Does innovativeness reduce startup survival rates?. Journal of Business Venturing, 30(4), 564-581.

Information and Communication Technology Agency of Sri Lanka. (2014). National ICT Workforce Survey, Final Report. retrieved from http://www.icta.lk/attachments/article/1247/Final%20Report-WFS.pdf

Jayasena, S., & Nanayakkara, C. (2012, December). External Critical Success Factors For The Growth Of Startup Software Development Companies In Sri Lanka. In Proceedings of International Conference on Business Management (Vol. 5).

Jennex, M. E., Amoroso, D., & Adelakun, O. (2004). E-commerce infrastructure success factors for small companies in developing economies. Electronic Commerce Research, 4(3), 263-286.

Lee, C., Lee, K., & Pennings, J. M. (2001). Internal capabilities, external networks, and performance: A study on technology-based ventures. Strategic management journal, 22(6-7), 615-640.

Lendner, C. (2007). University technology transfer through university business incubators and how they help start-ups. Edward Elgar, Handbook of Research on Techno-entrepreneurship. Cheltenham, 163-9.

Li, H. (2001). How does new venture strategy matter in the environment–performance relationship?. The journal of high technology management research, 12(2), 183-204.

Lowrey, Y. (2009). Startup Business Characteristics and Dynamics: A Data Analysis of the Kauffman Firm Survey.

Madill, J. J., Haines, Jr, G. H., & RIding, A. L. (2005). The role of angels in technology SMEs: A link to venture capital. Venture Capital, 7(2), 107-129.

Malterud, K. (2001). Qualitative research: standards, challenges, and guidelines. The lancet, 358(9280), 483-488.

Mann, C. L., & Sanyal, P. (2010). The financial structure of startup firms: The role of assets, information, and entrepreneur characteristics.

Matthews, J., & Dennis, J. (2003). Lessons From the Edge: Survival Skills for Starting and Growing a Company: Survival Skills for Starting and Growing a Company. Oxford University Press.

McDougall, P. P., Oviatt, B. M., & Shrader, R. C. (2003). A comparison of international and domestic new ventures. Journal of international entrepreneurship, 1(1), 59-82.

Mueller, T. A., & Georg Gemünden, H. (2009). Founder team interaction, customer and competitor orientation in software ventures. Management Research News, 32(6), 539-554.

O'neal, T. (2005). Evolving a successful university-based incubator: Lessons learned from the UCF technology incubator. Engineering Management Journal,17(3), 11-25.

Patton, M. Q. (2005). Qualitative research. John Wiley & Sons, Ltd.

Perez, L., Whitelock, J., & Florin, J. (2013). Learning about customers: Managing B2B alliances between small technology startups and industry leaders. European Journal of Marketing, 47(3/4), 431-462.

Phan, P., & Siegel, D. S. (2006). The effectiveness of university technology transfer. Foundations and Trends in Entrepreneurship, 2(2).

Pope, C., Ziebland, S., & Mays, N. (2000). Analysing qualitative data. Bmj, 320(7227), 114-116.

Porter, M. E. (2000). Location, competition, and economic development: Local clusters in a global economy. Economic development quarterly, 14(1), 15-34.

Prashantham, S., & Young, S. (2011). Post-Entry Speed of International New Ventures. Entrepreneurship Theory and Practice, 35(2), 275-292.

Revest, V., & Sapio, A. (2012). Financing technology-based small firms in Europe: what do we know?. Small Business Economics, 39(1), 179-205.

Ruef, M. (2002). Strong ties, weak ties and islands: structural and cultural predictors of organizational innovation. Industrial and Corporate Change, 11(3), 427-449.

Saarenketo, S., Puumalainen, K., Kuivalainen, O., &Kyläheiko, K. (2009). A knowledge-based view of growth in new ventures. European Business Review,21(6), 531-546.

Salmenkaita, J. P., & Salo, A. (2002). Rationales for government intervention in the commercialization of new technologies. Technology Analysis & Strategic Management, 14(2), 183-200.

Sbaraini, A., Carter, S. M., Evans, W. R., & Blinkhorn, A. (2011). How to do a grounded theory study: a worked example of a study of dental practices. BMC medical research methodology, 11(1), 1.

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. Academy of management review, 25(1), 217-226.

Shrader, R., & Siegel, D. S. (2007). Assessing the relationship between human capital and firm performance: evidence from technology-based new ventures. Entrepreneurship Theory and Practice, 31(6), 893-908.

Slater, S. F., & Narver, J. C. (2000). The positive effect of a market orientation on business profitability: a balanced replication. Journal of business research,48(1), 69-73.

Song, M., Podoynitsyna, K., Van Der Bij, H., & Halman, J. I. (2008). Success Factors in New Ventures: A Meta-analysis*. Journal of product innovation management, 25(1), 7-27.

Soriano, D. R. (2010). Management factors affecting the performance of technology firms. Journal of Business Research, 63(5), 463-470.

Sri Lanka Association of Software and Service Companies. (2014). Sri Lankan IT/BPM Industry 2014 Review. retrieved from http://www.slasscom.lk/content/sri-lankan-it-bpm-industry-review-2014

Tamer, J. (2005). Successful strategies for new venture development. Handbook of Business Strategy, 6(1), 115-121.

Tucker, L. (2009). Introduction to cloud computing for Startups and Developers. Sun Microsystems, Inc.

Van Gelderen, M., Thurik, R., & Bosma, N. (2005). Success and risk factors in the pre-startup phase. Small Business Economics, 24(4), 365-380.

Van Praag, C. M., & Versloot, P. H. (2007). What is the value of entrepreneurship? A review of recent research. Small business economics,29(4), 351-382.

Weeratunge, N. (2010). Developing Youth Entrepreneurs: A Viable Youth Employment Strategy in Sri Lanka?. The Challenge of Youth Employment in Sri Lanka, 167.

Zahra, S. A., Ireland, R. D., & Hitt, M. A. (2000). International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance. Academy of Management journal, 43(5), 925-950.

APPENDIX A – Questionnaire Instrument

 # Opening Discussion
Could you please tell a little bit about the history of you company?
- Focus should be on when, where, why, how, etc.

How you see the company today, for e.g., what is it doing, where it is heading?
- Focus is on where you are today (as you believe) compared to where you started
- Size, value, products, who you compete with

What do you consider as your major achievements/recognitions?

 # Founder information
What sort of an industry experience did you have at the time of starting up?
- Work experience?
- Have you ever tried to start a company before companyX?
- Have you had any marketing experience when starting companyX?

(If co-founder.)
- How did co-founders experience/expertise help?
- How was your relationship with your co-founders? Did you communicate often on company matters?

 # R&D related information
What sort of a role innovation, R&D & technology played in this journey?
- What are the more results oriented, low risk vs. high risk projects
- Level of R&D efforts

What's your take on spending on R&D? How did companyX manage it?
- Invest heavily? Or concentrated spending?

 # Industry and Market related information
How did the competition shape your strategy?

Was the market ready at that time & how did it shaped your strategy?
- What sort of marketing strategy did you use?
- If not, what did you do to create a market?

 # Resources in the startup phase + Government
What motivated you to start companyX?
- Motivation, environment, support, technology

How was the company financed?
- Who contributed & by how much, time frame

Who was in the initial team?
- Team members, roles, contributions, their expertise, skills
- Did any team member already havestartup experience?
- How many from the initial team is still with you?

Were there any other key contributors or mentors?
- Look for people who may have indirectly contributed

Any other support you may have got?
- Form other companies, universities, NGOs, government

Does your company have any patents? And how did they affectcompanyX at the startup stage?

Any challenges that you really had to conquer?
- Infrastructure requirements and how you got it

 # Other related information
What are the key factors that you believe contributed to company's success?

What do you recommend for new startups or someone interested in starting up?

What changes would you like to see in the environment to promote startups culture?
- Mindset of people/students, financing, open forums, policies, infrastructure, IP protection

APPENDIX B – Interview Request Email

Dear [Full Name],

I am a student studying for the MBA in Information Technology from the faculty Computer Science and Engineering in University of Moratuwa. We are conducting interviews as part of a research study to increase our understanding of what are the Critical Factors that contribute to the success of a Tech Start-up.

The interview takes around 30 minutes and is informal. Discussion topics to include the following:

- Early years of the company
- Initial team
- Innovation and R&D
- Market and challenges
- How it was financed
- Other factors that helped

We are simply trying to capture your thoughts and perspectives on factors that contributed as well as counteracted during your start-up endeavour. Your responses to the questions will be kept confidential. Please find attached a letter containing information about the study

Hope for a favourable response and thank you for your time.

Best Regards,

Nuwan Silva

MBA student,

Faculty of Computer Science & Engineering,

University of Moratuwa.

[Contact Information]

APPENDIX C – Interview Request Letter

[Name]
[Company and Address]

[Date]

Invitation to Participate in a Research on Critical Success Factors of Tech Start-ups

Dear [Name],

We are conducting interviews as part of a research study to increase our understanding of what are the Critical Factors that contribute to the success of a Tech Startup. As a founder of Cinergix you are in an ideal position to give us valuable firsthand information from your own perspective on the critical factors that contributed to the success of your organization as well as technological startups in Sri Lanka.

The interview takes around 30 minutes and is informal. Discussion topics to include the following:

- Early years of the company
- Initial team
- Innovation and R&D
- Market and challenges
- How it was financed
- Other factors that helped

We are simply trying to capture your thoughts and perspectives on factors that contributed as well as counteracted during your startupendeavor. Your responses to the questions will be kept confidential. Each interview will be assigned a number code to help ensure that personal identifiers are not revealed during the analysis and write up of findings. Your participation will be a valuable addition to our research and findings could lead to more successful tech startup in the country and globally.

This research study is conducted as part of the MBA in Information Technology (IT) postgraduate degree program conducted by the Department of Computer Science Engineering, University of Moratuwa.

We hope to have a useful and enlightening conversation.

Thank You.

Yours Truly,

Nuwan Silva
MBA Student,
Dept. of Computer Science & Engineering,
University of Moratuwa.

Dr. Dilum Bandara
Research Supervisor