Resources and entrepreneurial orientation

Empirical findings from the software industry of Sri Lanka

Master's thesis within business administration

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Abstract

Background: There are different types of firms in the world. Those that lead change and those who follow change. In this thesis, the authors have chosen to see if a dynamic industry in a developing nation can be the leaders of change, or if they are stuck as the ones following developments in the west.

Sri Lanka is a developing nation with a rapidly growing software industry. Like its neighbour, India, the country and region has been known for its cheap, yet highly skilled labour. This study thus aimed at seeing if something other than price, namely entrepreneurial strategy can play a meaningful role in explaining growth.

Purpose: To study the importance of the relationships between resources, entrepreneurial orientation, the perceived environment and growth in a developing nation perspective.

Theoretical framework: Theory based on the Resource Based View, arguing that unique combinations of resources and capabilities are the creators of strategy and competitive advantage, together with theory on the Entrepreneurial Orientation of firms looking at innovativeness, proactiveness, risk-taking autonomy of firms, was used to build a framework for analysing what drives growth in a dynamic market.

Method: In order to fulfil the purpose of the thesis, a quantitative study was conducted. A web survey was sent out to 73 firms, while 41 responded. A smaller qualitative study was also conducted in order to exemplify and provide deeper knowledge on the findings from the quantitative part.

Conclusion: Several important knowledge-based resources and the EO components of proactiveness and autonomy showed significant relations to growth. Also, the findings indicated that certain resources contributed significantly to the EO of firms. However, it was proved that Sri Lanka's software industry is not driven by innovation, but rather other factors.

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1   Introduction

In this chapter the authors will present the introduction and background to the study. It is also a chapter in which the research problem and questions are discussed. Finally, a purpose will be offered, together with the definitions that need to be addressed for understanding the topics presented in the thesis.

It is not necessary to change. Survival is not mandatory.

-W. Edwards Deming

This quote introduces us to the idea behind this thesis. Change lies in the nature of the human being, but contrary to Darwin's natural selection (if applied to business); it is not always the strongest firms that survive, but the ones that manage change in the best possible way.

In the process of managing change, entrepreneurs play an essential role as the ones responding to change. Throughout time, opportunities have appeared as a response to a change in the environment, or opportunity discovery has resulted in a change of the environment, and new ventures have been founded upon these opportunities. However, the outcome is something greater than the opportunity itself. For instance, Thomas Watson, the chairman of IBM said in 1943: *I think there is a world market of maybe five computers* (cited in Shepherd & Wiklund, 2005, p. 81). Although, at that time a small opportunity, it is quite obvious how the exploitation of this small opportunity changed and impacted the society of today. Following this example it can be said that some will form their enterprises upon small opportunities, become *leaders of change* and the Microsoft's of tomorrow; while others struggle for survival, fade away and sink into oblivion.

In the nowadays classical definition of entrepreneurship, Schumpeter (1934) described the entrepreneur as an innovator looking for- and carrying out *new combinations* with *existing resources*. However, the research field of entrepreneurship has more recently captured the idea of entrepreneurship on a firm level. In a model of entrepreneurship as strategy, the three factors defining the concept are now innovation, risk-taking and proactiveness (Covin & Slevin, 1989). These factors further extend entrepreneurship as a concept describing individual firm behaviour. However, even if entrepreneurship on a macro level contributes to growth (e.g. Wennekers and Thurik, 1999) – does entrepreneurship in an individual firm result in growth within the firm?

This topic has been widely discussed in strategy research, and it appears clear that firms characterized by innovation grow quickly while firms focusing on price are often already large and focus on maximal efficiency (e.g. Wiklund, 1998; Johnson & Scholes, 2002). Likewise, firms on dynamic markets are forced by the very characteristics of the environment to be innovative while firms on static markets can focus on planning and analysing efforts (e.g. Mintzberg, 1983; Melin & Hellgren, 1994). This leads to a conclusion that states that both types of approaches to profit and growth can be successful in their own specific context, but the type of change occurring within the firms when adjustments are made differ widely. The innovative change is characterized by proactiveness while change within a static industry is likely to be of adjusting kind, thus reactive.

Firm growth carries with it many important social and economical benefits that stretch far beyond those profits gained by owners. Employment opportunities are created; economic contributions are made towards the economy at large, and social welfare increases (e.g. Wennekers & Thurik, 1999; Holcombe, 1998). Former U.S. President Ronald Reagan said;

'Entrepreneurs and their small enterprises are responsible for almost all the economic growth in the United States' (Cited in Bianchi and Henrekson (2006, p. 1)).

The global software sector is an example of a highly dynamic industry and market. Established brands such as Microsoft, Oracle, Google, SAP, and Sun Technology are perhaps what first comes in mind when talking about the IT and software industry. However, new competitors constantly bombard the market with new products, and even the giants are forced to reinvent themselves. What has happened within the last five years is a steady increase in outsourcing of programming, mainly to India. Neighbouring India is Sri Lanka, with a software industry currently employing around 5,000 people and with exports exceeding USD 80 million. Like its neighbour, the island has experienced rapid growth of the software sector (Sri Lanka ICT Association, 2003).

Drawing upon the discussion of entrepreneurship and change, the authors of this thesis have found an interest in further investigating Sri Lanka's software industry. With inspiration from studies such as Wiklund (1998), the authors want to understand what drives growth and entrepreneurial activities within a rapidly growing and globally dynamic market, in a developing nation perspective. The intent of the present study is thus to explore the concept of entrepreneurial orientation as a strategy of capitalizing upon opportunities in order to generate firm growth. Although not being the purpose of the thesis, the authors also hope that an understanding of these types of factors will help the Sri Lankan software industry to steer to its fullest potential.

1.1   Background

To get an understanding of the country chosen to study, a general introduction of Sri Lanka is presented, leading down to a description of its software industry.

Sri Lanka is located in the Indian Ocean, just south of India. The island is sometimes referred to as Ceylon, which was its name until 1977. With an official population of 19.2 million, most people live in the capital, Colombo, with over 1.2 million inhabitants. With a population growth rate close to that of developed nations, it is an exception from other underdeveloped nations. This is much due to free education and health care for all citizens. Although having lot of different ethnic groups, the two major ones present in Sri Lanka are Singhalese ($3/4^{th}$ of the population) and the Tamils. Since independence from being a British colony in 1948 there has been tension and political instability between these two ethic groups. The struggles have included periods of war and heavy violence, which at times has hindered the development of the nation and also frightened away foreign investments. All together this ongoing conflict since 1983 has contributed to a slower development rate than could have been achieved else wise. At present the situation has been troublesome with frequent killings in the north east of the country (Landguiden, 2005; World Bank & Asian Development Bank, 2005).

Although being a poor, debt loaded and foreign aid dependent country, Sri Lanka has managed to maintain a much better quality of life for their citizens than many other countries, like its neighbour India for instance. The population does not only have a high level of education, literacy, and longer life expectancy, but they also have more money. The Sri Lankan GNP (Gross National Product) per person was about twice that of neighbouring India (Landguiden, 2005). In the 1960s Sri Lanka had a per capita income comparable to the so-called *south east Asian tigers*, and the *second wave tigers* of Malaysia and Thailand (Dent, 1998), but has since then failed to keep up with the pace of economic

growth and poverty reduction. Nowadays, Sri Lanka's per capita income is less than half of Thailand's and an even smaller share of Malaysia's and Korea's (World Bank & Asian Development Bank, 2005).

According to the World Bank and Asian Development Bank (2005), Sri Lanka stands out among other developing countries due to its good governance. The corruption is not that widespread as in many other developing nations, implying that firms benefit from the low corruption level and that it is no longer considered as a significant obstacle for making business (World Bank & Asian Development Bank, 2005).

While one of Sri Lanka's strength is the governance, the weaknesses in infrastructure are cited as a top constrains by Sri Lankan enterprises (World Bank & Asian Development Bank, 2005). For instance, electricity represents a barrier to entry since access to it is heavily concentrated to urban areas. Also, even if a Sri Lankan firm has access to electricity, the cost is high and supply unreliable, exposing firms to a great risk resulting in increased production cost. Furthermore, the weakness of infrastructure in terms of transportation and poor quality of roads is also crucial according to Sri Lankan firms. Furthermore, a recent survey indicates that the cost of finance and limited access to such stands out as a major constraint for both urban and rural firms (World Bank & Asian Development Bank, 2005).

According to World Bank and Asian Development Bank (2005), the economic prospects of Sri Lanka, as the small and open economy it is, heavily depends on maintaining robust export growth.

Over the past 25 years, Sri Lanka has faced a steady economic growth and has profoundly transformed its industrial structure and trade. The economy is still based on agriculture but at an ever increasing pace light industry is emerging as a key contributor. Since independence from the British Commonwealth in 1948, the country has tried to lessen the dependence on exports from tea, cocoa and rubber (which made up 90% of exports in 1960). In the 1990's, only 20% of exports came from these products. Instead, manufacturing industry has taken over, led by garments and textiles growing with 32 percent a year between 1978 and 1995, now holding a 75% share of exports. However, the manufacturing industry's part of GNP has not increased as rapidly (Landguiden, 2005).

Furthermore, financial services and the construction industry have increased vastly, as well as the service sector in general (Landguiden, 2005; World Bank & Asian Development Bank, 2005). The service sector contributes to over 50% of GNP and is made up of a large social services network and government functions. Despite the instable political situation, tourism has been of importance as well. The technology sector, particularly the IT sector, has also taken great leaps forward, showing very rapid growth since 1996 (Landguiden, 2005).

According to the Swedish International Development Agency (SIDA) (2002), the Sri Lankan Information and Communication Technology (ICT) sector is modest, but thriving, boasting many state-of-the-art ICT capabilities. Belonging to this are the software and telecom sectors, who despite many problems and a rather small size are growing rapidly. A few problem areas have been identified including the lack of transparency in government acquisitions, the lack of international standard bandwidth, lack of trained ICT professionals and management-class knowledge about ICT and tax structure that does not reward local sales. Funding has been given to Sri Lanka, especially by USAID (but also by SIDA and

similar organisations), to increase the competitiveness for the ICT sector. Several plans and guidelines have been developed for this purpose and it is believed that if followed, success can be a reality. However, the use of ICT in the private and commercial sector in general is limited but increasing slowly. The firms that have invested greatly in ICT are now country leaders in the use of technology (SIDA, 2002).

Looking at the software industry of Sri Lanka exclusively, although still in its nascent phase it employs about 5000-6000 professionals and the sector has made some quite impressive progress in exports since 1996. At that time the export stood at around USD 5.0 million, which increased to about USD 58.0 million in 2001, to be further enhanced to USD 80.0 million at the end of 2003 (Sri Lanka ICT Association, 2003). There are currently around 100 software development companies in the country (Patterson, 2006). Furthermore, branch organisation Software Exporters Association (SEA) has set a goal to export USD 1.0 billion by the year 2012. Besides the economic policy uncertainty, and macroeconomic instability, there is a shortage of skilled professionals, lack of venture capital and fairly narrow telecommunication bandwidth a lot of work has to be put in to improve these things (US Embassy Report, 2001; World Bank & Asian Development Bank, 2005). Furthermore, Sri Lankan software firms also cited in 2004 that corruption was one of the major impediments to their operations (World Bank & Asian Development Bank, 2005). Even though corruption nowadays does not seem to be an obstacle in Sri Lanka in general, this is cited as constrain by the industry and its firm (World Bank & Asian Development Bank, 2005). According to an interviewee (who prefers anonymity in regards to this statement), this may be due to the close connection between the state owned company owning the only fibre cable connecting Sri Lanka to internet, and the country's regulatory body.

As a response to tackle the impediments, several ICT initiatives have been taken by the government. The Information, Communication and Technology Agency (ICTA) was established to promote investments in ICT for private sectors, non governmental organisations (NGO's) and within the government, increasing the possibility for software sector growth. Also, ICTA works hard with increasing the ICT-trained human resources, building capacity for the industry to grow without human resource constrains. Increasing managerial capacity and highly skilled technical staff are the main areas of work. In a recent report on Sri Lanka, the World Bank and Asian Development Bank (2005) states that these initiatives will only provide marginal help for the software sector. Even though not sufficient, it is a step in the right direction.

Furthermore, the World Bank and the Asian Development Bank (2005) states that the development of the software industry holds great potential for economic growth. However, before the industry can fully exploit opportunities in the dynamic and international market it must overcome the certain obstacles discussed.

Globalization of the information technology businesses has had and will have further impact on the ability to create wealth among software companies (Novak & Grantham, 2000). As it forces western firms to be more competitive, it opens up opportunities for other parts of the world. Growth of the Internet and Internet Service Providers (ISPs) provides a low cost channel for marketing, sales and distribution for new software products all around the world. Although there are a few huge and well known firms within the industry (such as Microsoft, Oracle, Google), it mainly consists of small innovative firms trying to make a living (Novak & Grantham, 2000).

The authors find the software industry interesting to look at because of its dynamism, and also its rapid growth and vast opportunities. Sri Lanka is one of the nations with the possibility to develop a highly competitive software industry, although a lot of issues need to be improved and resolved to allow for its full potential to be used. As will be further discussed below, the authors hope to gain an understanding of what drives development and growth in this industry.

1.2 Problem discussion and research questions

It is clearly understood from the background that the software industry of Sri Lanka is one experiencing growth and given the goals of the industry, it is believed to have potential. However, Sri Lanka is a country where the majority of income comes from agricultural or other labour intensive industries and only lately a shift towards knowledge and capital intensive industries have been spotted (Landguiden, 2005). The question that needs to be addressed though, is if these knowledge intensive industries, such as the software industry will be characterized by research, innovation and product and service generation or be characterized as a new type of labour intensive operation, where the highly skilled labour are only used for basic tasks because of its low price.

What the authors intend to investigate in the software industry is if there is an existence of entrepreneurial behaviour and if this exists, does it contribute to the performance of the firms? Further explorations need to be done on what the resources that drive the industry, its growth and its entrepreneurial orientation are.

Dealing with several types of constrains, as being a developing nation involves; how does this affect the development of a new and hopeful industry? The effects of the environment on a firm may in fact affect the way they chose strategic alternatives and how they do business. This thesis will investigate several angles of the Sri Lankan software industry, using a framework consisting of well worked out theory on resources and their importance, entrepreneurial orientation and environmental hostility. It all leads down to the following research questions, which hopefully will be answered as the conclusion emerges:

What is the relationship between the availability of resources and an entrepreneurial orientation?

What is the relationship between the availability of resources and growth?

Is there a relationship between entrepreneurial orientation and growth?

What role does the environment play in regards to entrepreneurial orientation and access to resources?

What can be said about strategy in regards to resources, entrepreneurial orientation and the dynamism of the Sri Lankan software industry?

If any relationships can be found, how can this information be used to help the policy makers of the industry and the firms to compete in a better way?

1.3 Purpose

It is the intention of the authors to study the importance of the relationships between resources, entrepreneurial orientation, the perceived environment and growth within Sri Lanka's software industry.

1.4   Definitions

Firm size, growth, and various entrepreneurial-based notions are central concepts in the present study. Therefore, it might be of help for the reader to define these certain concepts from the beginning, thus, facilitating the understanding and interpretation of the study.

- *Entrepreneurship* is throughout the present study defined as *taking advantage of opportunity by novel combinations of resources in ways which have impact on the market* (Shepherd & Wiklund, 2005, p 2). Thus, the definition presented by Shepherd and Wiklund holds opportunity consistent, and as stressed by Stevenson and Jarillo (1990) with *novel combinations of existing resources* (as Schumpeter (1942) originally defined entrepreneurship in modern times). Also, by adding *impact on the market,* the effects of entrepreneurship are also highlighted. See also section 2.4 for a discussion on a broader level.

- *Entrepreneurial Orientation* (EO) is the strategic orientation of the firm, referring to the business managers' perception of the company's strategic orientation and is measured empirically. A longer discussion regarding EO takes place in section 2.4.1.

- *Growth* in this study referred to as the process of change in size in terms of employees and sales from one period to another. In analysis, the term average sales- and employee growth is used, referring to the average growth in sales- and employees per year (measured from 2003). See also section 3.4.1.

- Firms within the sample will be divided according to the European Union's definition of company size. Hence, *micro firms* are those with 1-9 employees, *small businesses* the ones with 10-49, *medium sized* businesses have between 50 and 249 employees, whereas *large firms* are those with 250 employees or more (European Union, 2003). Furthermore, the European Union's definition also categorises the firms by the annual turnover. However, this is not used to categorise firms in the present study. Also, it is not the intention to delimitate the present study to only one category of firms, however, since the terms are used throughout the thesis it might be of ease for the reader to initially clarify the definitions.

1.5   Outline of the thesis

In order to guide the reader through this study, it is justified to present the structure of the thesis. The present chapter, *chapter 1*, gives an *introduction* to the study and a background together with a problem discussion and research questions, leading down to the purpose.

Chapter 2 accounts for the *method* chosen and applied in order to answer to the purpose. A discussion is held about several theoretical concepts regarding methodology relevant to the present study; research philosophy, research approach, research strategy, data gathering, design of the study, and statistical methods used. Throughout, the authors also will motivate for the chosen approach, and how about the study has been conducted.

Chapter 3 will take the reader through a presentation of the existing research in the research fields investigated, creating the *theoretical framework* of the study. These theories will then be used to construct a model for analysis, which will be presented at the end of the chapter.

Chapter 4 outlines the *empirical findings* for the study. The empirical findings consist of information gathered from secondary sources, but principally quantitative and qualitative data from primary sources.

Chapter 5 is concerned with the *analysis* of the data collected. Thus, this chapter accounts for interpretation and analysis the empirical findings using existing theories and models reflected in the theoretical framework.

Chapter 6 sums up the analysed data providing the *conclusions* of the study, providing answers for the research questions and the purpose.

Chapter 7 accounts for the final remarks, a *final discussion*, including implications, method criticism and trustworthiness of the study. After all, the chapter ends with suggestions for further research.

2 Theoretical framework

This chapter will take the reader through a presentation of the existing theories and previous research in the research fields of interest. These theories will be used to construct a model for analysis, which will be presented at the end of the chapter.

2.1 Introduction

Having a purpose of the present study to examine the relation between resources, entrepreneurial orientation, the perceived environment and growth, the theoretical base will have to depart from somewhere. Naturally, the frame of references will be based upon the areas of investigation; resources and its relation to growth, how the environment affects strategy, and entrepreneurial orientation.

It is believed that the capacity of resources available to a firm and the environment in which the firm operates affects its strategy, which in turn affects performance (e.g. Chandler & Hanks, 1994; Wiklund, 1998). A major theoretical perspective that has lifted the importance of resources and the use of resources in unique ways to create competitive advantage is the Resource Based View (RBV). It describes how strategy and competitiveness is a function of the combination and use of resources and capabilities in ways in which are valuable, rare, imperfectly imitable and non-substitutable (Barney, 1991).

The notion that strategy differs depending on the resources possessed by a firm builds an understanding of why firms differ. However, it is also argued that the environment plays a part in determining strategy of a firm. It has been observed that strategy in hostile and dynamic environments is not the same as strategy in stable and inert environments. Flexibility, innovation, creativity and visionary leadership are talked about as even more important the more rapidly an environment changes (Johnson & Scholes, 2002; Eisenhardt & Jeffrey, 2000; Melin & Hellgren, 1994; Mintzberg & Waters, 1985)

A way of strategically handling change, and to lead change, is through the process of entrepreneurship. Scholars have for long argued how the creation of new firms and innovation leads to economic growth (e.g. Wennekers & Thurik, 1999; Henrekson & Ronnie, 2006). The concept of entrepreneurship as a strategy has been integrated into a firm perspective, aiming to create an understanding for the importance of corporate entrepreneurship. This notion is referred to as Entrepreneurial Orientation (EO) (Dess & Lumpkin, 1996; 2005; Wiklund, 1998; Wiklund & Shepherd, 2002). It describes the strategic and behavioural approach of a firm looking at primarily innovativeness, proactiveness and risk taking. Lately, a stream of research has emerged also including autonomy and competitive aggressiveness in the framework of EO.

The above presented theory is a brief introduction of what will follow in this section. The disposition of this chapter, furthermore, follows a clear outline where the theoretical framework of resources and capabilities and are firstly discussed. Secondly, theories on strategy, and how the environment affects a firm's strategic orientation, are presented. Thirdly, the proactive strategy of entrepreneurial orientation and its relation to the environment in which it operates is examined. All this will lead down to create a research model from which the authors draw hypothesis for the study.

2.2   Resources and capabilities

As Sun Tzu, the ancient Chinese author, realised already in the 6th century BC, 'There are not more than five primary colours (blue, yellow, red, white, and black), yet in combination they produce more hues than can ever be seen' (Sun Tzu, 1989, p. 32).

Applying the quote to what will be presented and discussed in this section, namely resources and capabilities, they like colours work like construction stones of a firm and combined they make the internal set-up for meeting opportunities in the environment. The unique combinations are what make one firm different from another or one combination of colours unlike another. In newly started firms, access to resources is the result of the founders' ability to gather them and their ability to form strategies to utilize them efficiently, together with the overall availability of resources from the environment (Grants, 1991). Recent literature broadly defines resources and capabilities in two different ways. The first set of researchers (including Barney, 1991; Peteraf, 1993) draw no clear distinction between resources and capabilities, but instead include all assets, capabilities, organisational processes, firm attributes, information, knowledge etcetera (Ethiraj, Kale, Krishnan & Singh, 2005). Along the other line, scholars (such as Grant, 1991; Amit & Schoemaker, 1993) clearly separate the terms resources and capabilities. They argue that 'resources consist…of know-how that can be traded, financial or physical assets, human capital etc. [whereas] capabilities…refer to a firm's capacity to deploy resources' (Amit and Schoemaker, 1993 p.35).

These two sets of perspectives are part of a strain of literature referred to as the Resource Based View (RBV) or Perspective (RBP). It stems from the early theories of firm growth and performance presented by Penrose (1959) and the 1960's and 1970's mainstream American strategic thinking (Andrews, 1971; Ansoff, 1965; Hofer & Schendel 1979). Penrose argued that firms consist of bundles of resources that carry out services in an administrative framework. The American scholars introduced the concept of firms' internal strengths and weaknesses together with the opportunities and threats of the environment. Environmental models, such as Porter's Five Forces Model, saw firms as homogenous in regard to the resources and strategies they possessed and if they were heterogeneous, this was only for a short period of time as resources were highly transferable (M. Nordqvist, personal communication, 2005). Competitive advantage could only be reached by cost advantage or differentiation advantage. In response to this, the RBV took on in the 1980's, focusing on understanding how the internal strengths and weaknesses contributed to a fit with the environment (Foss, 1997), while assuming resource heterogeneity. With Wernerfeldt (1984) as the starting point, research in the field has developed further and is still under development.

A large number of scholars have debated and presented theories, discussions and papers related to the RBV of firms. As a result, the terminology used to define what contributes to the competitive advantage of firms has been widely different between authors. While Wernerfeldt (1984) defines resources as 'anything which could be thought of as a strength or weakness of a given firm', Barney (1991, p. 101) states that a resource is 'anything that enables the firm to conceive of and implement strategies that improve its efficiency and effectiveness'. While Barney does not differentiate between the concepts of resources and capabilities, but rather mentions capabilities as resources, Grant (1991) takes on a different approach. He separates resources, as the basic input of the production process, and capabilities. In accordance with Grant's (1991) notion, Chandler and Hanks (1994, p. 334) define capabilities as 'the capacity for a coordinated set of resources to perform some task.' The distinction between resources and capabilities is also found in the early work of

Penrose (1954), who separates a firm's bundle of resources from the services that they may carry out.

Another perspective is brought by Hamel and Prahalad (1990) who introduced the concept of *core competences* as the source of competitive advantage. A core competence is seen as the 'collective learning of an organisation, especially how to coordinate diverse production skills and integrate multiple streams of technology' (p. 82).

In common these different definitions state that there is something that brings competitive advantage. If it is resources, capabilities or competences can be argued but either way they are part of the following categories of firm resources (Barney 1991; Grants 1991): *financial, human capital, organisational, technological* and *reputation*. A further separation of resources is done by Miller and Shamsie (1996) who divides them into knowledge-based resources and property-based resources. For example, technological resources can be both tangible (property-based) such as computers and research and development (R&D) facilities and intangible (knowledge-based) like unique engineering skill, programming ability etc.

Also, although the definition of resources and capabilities differ between scholars, the general outcome for strategy and performance is the same. The RBV of firms focuses on the ability of a firm to create competitive advantage by combining resources in unique ways, and matching strategies to these. Barney (1991) presents the VRIN-, later VRIO-framework (Barney, 1995) for resource/capability analysis. Resources have to be valuable, rare, imperfectly imitable and non-substitutable (later having *Organisation*) in order to meet the criterion for holding a competitive advantage. Grant (1991) holds a similar discussion and talk about the durability, transparency, transferability and replicability of capabilities as determinants of a competitive advantage.

Concluding this section, Wernerfeldt (1997) states that although there are differences in opinions regarding the RBV, most researchers at least agree that (1) resources are fixed inputs and (2) sustainable competitive advantage is brought by those resources (and/or capabilities) that are hard to imitate and scarce relative to their economic value. Foss (1997) further mentions that the basic assumptions to the RBV is (1) that differences in firms' resource endowments cause performance differences and (2) firms seek to increase (if not necessarily maximize) their economic performance. Following the discussion above, in the next section, a more detailed presentation of the specific types of resources and capabilities contributing to performance will be reviewed.

2.2.1 What type of resources create competitive advantage and growth?

The core of the RBV is that the right combinations of resources and capabilities have the potential to create strategy that fully utilizes a firms' competitive advantage. This in turn gives the ability to be different in the market place and gain an advantage against competitors. Growth is thus a result of fully using the abilities brought by resources and capabilities. It can be illustrated by the following figure, taken from Wiklund (1998, p. 25)
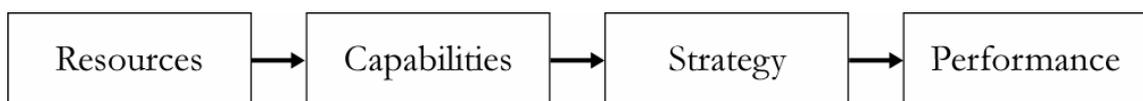
Figure 2-1 The resource based perspective (Wiklund, 1998, p. 25)

Although the relation between resources and performance is clear, it has been understood from the previous sections that all resources are not equally valuable to a firm.

When it comes to the resources that are of particular importance to sustain competitive advantage, it is argued that knowledge-based resources carry this capacity (McEvily and Chakravarthy, 2002). This is because of the fact that they are hard, if not impossible, to imitate (McEvily and Chakravarthy, 2002), and determine if the company has what it takes to be entrepreneurial (Galunic and Eisenhardt, 1994), while they can also have the ability to enhance performance of a firm (McGrath, Tsai, Venkataraman, MacMillan, 1996). Looking at the earlier presented VRIO framework (Barney, 1995), the O (concerning organisation), had previously been neglected as an important part. However, it is the organisational structure and routines that make the resources capable of delivering competitive advantage. Eisenhardt and Martin (2000) stretch this notion further with their concept of dynamic capabilities. Here, the organisation is what makes possible the constant recombination of resources to create a strategy fitted to a dynamic, ever changing, environment. They argue that the only sustainable competitive advantage is in fact constant renewal and innovation (Eisenhardt and Martin, 2000).

Wiklund and Shepherd (2002) present relevant information to argue that growth occurs as knowledge-based resources and property-based resources are used to facilitate the discovery and exploitation of opportunity. Equally, Grant (1991) draws on the concept of having a strategy that is build carefully on the capabilities and resources of the firm, may be the key to performance success.

Knowledge of know-how and procedures, are further argued to be of primary importance (Wiklund & Shepherd, 2002). Two types of this include knowledge of markets and technology. Market knowledge is important because it raises awareness of the possibilities in the environment. Three examples are mentioned:

1. General customer problems may in fact be real market opportunities, accessible only by knowledge of the market.

2. Knowing the market means that benchmarking the value of new ideas, discoveries and technological improvements is easier.

3. Knowing your customers and their behaviour can make innovation easier as it is understood what they may in fact have a need for and not.

Shane (2000) argues that it is difficult for companies lacking this knowledge to both develop new innovations and also to define marketing strategies to capitalize on these products.

Further, technological knowledge is also important as a platform for potential growth. Several reasons are named to why this is; including that technological knowledge can determine how well products and services can be created in terms of design, functionality, efficiency and so forth (Rosenberg, 1994). Also, equally important, technological knowledge and development can lead to cutting edge break-throughs, which in the longer run can change markets. Wiklund and Shepherd (2002) argue that the market knowledge and technological knowledge together are the most important in determining the potential to meet opportunities, thus bringing potential to grow.

Other researchers have presented more suggestions of resources that may help to bring competitive advantage. Managerial resources, for instance, is mentioned as one of the most important resources in bringing the opportunity for growth (Barney, 1991; Penrose, 1959). It is argued that managerial resources have the capacity to develop firm specific capabilities and thus in turn determine what productive services a firm can deliver. The managers'

perception of the environment will also determine in which way a firm develops its resource base (Pettus, 2001). Further, relating to the previously mentioned notice of dynamic capabilities, Pettus (2001) argues that managerial resources utilize the creation of tasks that brings dynamic firm growth. In other words, they help to develop the process of continually renewing a firm's source of competitive advantage, providing a dynamic basis for long term growth (Hamel and Heene, 1994).

Financial resources have also been identified as potentially important in creating competitive advantage (Cooper, Gimeno-Gascco & Woo, 1994). Not only possessing financial capital, but having access to it is important (Stevenson & Jarillo, 1990). Although it could be argued that opportunities should and could be met with existing resources of the firm, it is difficult if the manager feels like the firm does not have access to enough financial resources from the start (Shepherd & Wiklund, 2005).

Also, emphasis has been put on networks as a highly valuable resource. Johansson (1990) describes networks as 'the strategically most significant resource of the firm' (p. 41). Being defined as 'a set of nodes (persons and/or organisations) linked by a set of social relationships (friendship, transfer of funds, overlapping membership) of a specified type' (Laumann, Galaskiewicz, and Marsden, 1978 p. 458) they differ from other types of relationships in their focus on collaboration and mutual gain (Larson, 1992). Networks are a way of sharing resources, including market channels, market information and other specific knowledge. Being argued by some to be an important resource for firm, especially for small firms with resource constrains (Shepherd & Wiklund, 2005), it may provide evolve into a source of competitive advantage against other actors on a market.

To conclude, a firm's strategy and performance is highly dependent on its tangible- and especially on its intangible resources, as highlighted throughout this chapter. The figure below illustrates the view of the component of resources (through which resources will be measured) in the present study:

Resources
Market expertise
Customer service
Managerial expertise
Financial resources
Network (social and business)
Technical knowledge
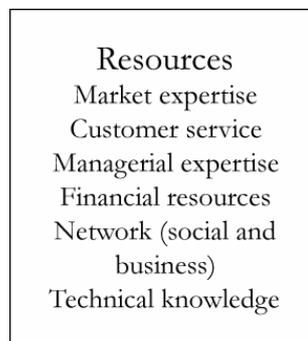
Figure 2-2 Component of the research model - Resources as viewed in the present study

Having examined resources and capabilities, their impact on the firm strategy becomes apparent. While the resources (and capabilities) creates the base from which a firm competitive capacity departs, strategy concerns the mean of reaching to the goal. Given the topic of this thesis, it is relevant to examine how resources and environmental fit indicates the strategic orientation of firms, which takes us to the next section of this thesis. It will talk about the different strategic options available in regards to meeting, or leading, change and the strategic requirements to do so.

2.3   Strategic orientation of firms

The strategic orientation of a firm determines where the firm is heading, while the resources and capabilities of the firm drive the creation of strategy (Brown, Davidsson & Wiklund, 2001). There are several ways to describe this 'orientation'. Johnson and Scholes (2002) present three lenses of strategy: the design lens, the experience lens and the idea lens. Characteristics of the design lens include using analysis, formulation and planning as the main tool to reach efficiency. Competition is met by adopting strategies such as economies of scale and cost efficiency. The experience lens has a softer approach and is the result of organisational learning and adaptation. Adjustments to the environment are made constantly in small, incremental, steps. Last, the idea lens presents a more creative approach to strategy, using innovation as the tool to change the way business is being made. As these are broad generalizations of strategy, it is not likely that a firm only uses one of the lenses but instead uses all, but to different extents (Johnson & Scholes, 2002).

The above described view of strategic orientation is similar to what many other researchers in the field have used. For instance, Melin & Hellgren (1994) present a matrix typology of strategic change for analysing how firms move between different lenses with time. The matrix includes the labels continuous adaptation/revolutionary change on one axis and the labels proactive/reactive on the other. Similarly to the lenses, a proactive and revolutionary change strategy would be identified as being part of the idea lens, while reactive continuous adaptation would be part of the design lens. Mintzberg (1983) discusses why different approaches are used by different firms and explains this by which market they are on and which position in the market they aim at having. For example, a firm intending to be the price leader will find it important to maintain a highly efficient organisation with full control over budget, production etcetera, thus indicating the need for a more 'analysis and planning' approach to strategy. Likewise, firms aiming to be the leaders of change need high levels of innovation and a dynamic organisation to handle it. Hamel (1996) makes the separation between rule breakers, rule makers and rule takers of an industry. Being a rule breaker means changing the ways things are done by being innovative and radical. The rule makers are the well established firms being challenged by the rule breakers, while the rule takers live a dangerous life trying to copy the concepts from the others. The only way for rule takers to survive is through maintaining lower prices or better quality than their established and revolutionary competitors.

Current research on small firms highlights that there is no difference in the performance of firms focusing on either strategy (efficiency or flexibility). However, according to an analysis of two large samples of small firms, those who mix these strategies significantly under perform (Johnson & Ebben, 2005). This does not necessarily mean that any firm can apply any strategy, but instead the outcome will be determined by certain firm specific factors. As Mintzberg and Waters (1985) states, a firm's strategy depends on its goals and market. Thus strategy and structure must be adapted to the intentions of the firm.

2.3.1   Dynamic environments and strategy

As discussed in the previous section a few distinctions can be made in regards to firms and their chosen strategic orientation. As this thesis deals with dynamic and potentially hostile environments, it would be in place to further deepen the theoretical knowledge in this area.

In the nature of dynamic environments lies the notion of constant change. One can never adapt fully to an ever changing environment, but rather only try to make the organisation as flexible as possible to allow for leading and meeting change (Eisenhardt & Jeffrey, 2000).

The movement of the environment also creates plenty of opportunity gaps to act upon. For example, the telecommunications industry has more potential to exploit global opportunities than other sectors (such as some sectors of retailing). At the same time, they are likely to meet high and sophisticated competition in their attempts to approach these opportunities (Johnson & Scholes, 2002).

Although it is common to believe that small firms are the leaders of innovation, it should be mentioned that 80% of R&D efforts in the developed world are conducted within firms of 10,000 employees or more (Hoskisson & Busenitz, 2002). However, small firms are the best at product innovation and creating new products while the large firms are better at managerial innovation (Hoskisson & Busenitz, 2002). Further, the way small and large firms act to meet uncertainty and opportunities differ vastly because of their size. While large firms tend to adopt flexibility in the shape of corporate entrepreneurship (Hoskisson & Busenitz, 2002; Stopford & Baden-Fuller, 1994), smaller firms are flexible and dynamic in their natural state. Within the flexible organisations, less emphasis is put on top-down design while variety and diversity inside and around the organisations is stressed as much more important. Equally, they stretch that consensus can not always be reached because of the complexity and rapid change of a dynamic environment, thus requiring challenging and questioning of taken-for-granted assumptions and increasing the importance of experimentation (Johnson & Scholes, 2002).

Mintzberg and Waters (1985), in their discussion of deliberate and emergent strategies, claim that as prediction is harder in highly dynamic environments it is a less recommended approach to apply planning to high extents. Instead, flexibility (like mentioned by Johnson & Scholes (2002)), is stressed. This means that strategies will take on a more emergent role, being guided by the unfolding actions of the firm to handle the environment. Mintzberg and Waters (1985) further stresses that the main difference between deliberate and emergent strategy is that while the first focuses on planning and control, the former makes 'strategic learning' possible. This learning is what helps to identify and take into account the opportunities that is created in a dynamic environment.

Following the notion of flexibility, it is important to understand the consequences of not keeping up to date with a changing environment. Melin and Hellgren (1994), discuss four different types of change in their first change typology. While firms in dynamic markets should apply proactive strategies, either incrementally or revolutionary, to keep up to date, firms that do not are forced to stay with less attractive alternatives. Reactive change to environmental changes is rather harsh and characterized by revolutionary reactive change or incremental reactive change. These two indicate that a drift from the environment has occurred in terms of strategy (Johnson & Scholes, 2002; Mintzberg & Waters, 1985), and varying degrees of action has to be taken to make the firm fit again (Melin & Hellgren, 1994).

The characteristics of the dynamic environment and the type of strategic actions that need to be taken to respond to these characteristics lead us to believe that to keep pace with environmental changes and increasing competition, firms must adopt entrepreneurial actions and initiatives, bringing us forth to the next section which is about EO of firms.

2.4   From the entrepreneur to entrepreneurship as strategy

Addressing EO as one major component of the present study, the authors believes it is of importance not only to understand the concept profoundly, but also the foundation from

which it derives. Strategy and the resource based view are such areas. Another is the field of entrepreneurship, and its pathway from the origin of the word entrepreneur until the view on corporate entrepreneurship as a strategy will below be clarified and reviewed.

The field of entrepreneurship is a relatively young paradigm in management studies (Bygrave, 1989; Vesper, 1986). The concept of entrepreneurship derives from the French word *entreprendre* signifying someone who 'undertakes', introduced by Cantillion in 1755. In business and management this is generally interpreted as new venture creation (Kuratko & Hodgetts, 2001; Gartner, 1989).The entrepreneur was therefore first considered as the individual who founded enterprises. The emphasis on individual characteristics and innovative abilities of this individual was during an extensive period of time the focus of research (Miller, 1983). However, Schumpeter (1942) developed the modern definition of entrepreneurship as a process of carrying out *new combinations* with *existing resources* and thereby shifted the focus from the individual entrepreneur to entrepreneurship incorporated in firms through seeking innovations by devoting resources to such an activity (Lumpkin & Dess, 2005). By doing so, the definition of entrepreneurship could be used in a broader and less restrictive manner (Wiklund & Shepherd, 2005).

Furthermore Stevenson and Jarillo (1990) pointed out that entrepreneurship is more than just starting new businesses, it is more concerned with the mode of management. Therefore in established organisations entrepreneurship is largely a management question (Brown *et. al*, 2001). This illustrates that the concept of entrepreneurship has applied to different levels; firstly the individual (from the origin of the word entrepreneur introduced by Cantillion in 1755) and later on entire organisations (as suggested by Stevenson and Jarillo (1990)).

Thus, new entry and new venture creation is not only in nature essential to entrepreneurship on an individual level, but and also on a firm-level basis (in a strategic business unit, or in the context of a large corporation) (Wiklund & Shepherd, 2002).

During the last decade, emphasis has been added to corporate entrepreneurship as means of growth because of the strategic choice facing firms (Zahra & Covin, 1995; Guth & Ginsberg, 1990). The importance of corporate entrepreneurship is further stressed by Miller (1983); '…what is most important is not who is the critical actor [the entrepreneur], but the process of entrepreneurship itself and the organisational factors which foster and impede it' (p. 770). Furthermore, to engage in new entry activities capitalizing upon new opportunities, to create above-average returns and contribute to sustainable advantages as corporate entrepreneurship shows, Dess and Lumpkin (2005) argues that it has to be conducted effectively. Dess and Lumpkin (2005) (among others) further states that empirical evidence demonstrate that non risk-avert companies where culture and management stimulates innovativeness, pursues new venture opportunities, resulting in above-average growth. It is on the idea of engaging in corporate entrepreneurship as means of growth, that the notion of EO is built.

2.4.1   Entrepreneurial orientation

EO refers to the strategic orientation and the entrepreneurial aspects of a firm, deriving from the RBV (Penrose, 1954) and drawing upon the work by Miller (1983) and has emerged as a major construct within strategic management and entrepreneurship in the recent years (Covin, Green & Slevin, 2006; Wiklund & Shepherd, 2005B).

As initiated by Miller (1983), EO is concerned with entrepreneurship as a firm-level strategy, and this in turn has its origin in the theory of corporate entrepreneurship as means of growth, performance and strategic renewal for already established firms, as suggested by Guth & Ginsberg (1990).

As explained in 2.3.1, a company's strategic orientation describes what factors that drive the creation of strategy (Brown *et. al*, 2001), and in the concept of EO, corporate entrepreneurship is such a drive for long-term performance. According to Dess and Lumpkin (2005) it is necessary for firms that want to engage in corporate entrepreneurship to have an EO. Thus, if the goal is corporate entrepreneurship, the mean to successfully reach the goal, is EO (e.g. Wiklund, 1998; Dess & Lumpkin. 2005).

Further, EO does not represent entrepreneurship as *new entry* (as the section on entrepreneurship emphases). While new entry refers and explains *what* entrepreneurship consists of, EO 'describes 'how' new entry is undertaken' (Dess & Lumpkin, 1996, p. 136). Thus, EO concerns new entry and the managerial perspective of the firm, and more specifically the *processes, practices*, and *decision making* that result in such. Furthermore, it refers to the practice of strategy in businesses that generates identification and exploitation of new opportunities creating new corporate ventures. As suggested by Covin and Slevin (1991), it is a perspective and framework of entrepreneurship that is reflected in the ongoing processes, management and culture of a firm. Such a culture can be exemplified through the entrepreneurial mode of strategy making in which 'strategy making is dominated by the active search for new opportunities – the entrepreneurial organisation focuses on opportunities; problems are secondary' (Mintzberg, 1973, p. 45). Thus, EO is strongly connected to the field of strategy.

Miller (1983) concluded that the entrepreneurial firm (or a firm taking an entrepreneurial strategy approach) and its characteristics as 'an entrepreneurial firm is one that engages in product market innovation, undertakes somewhat risky ventures, and is the first to come up with 'proactive' innovations, beating competitors to the punch' (p. 771). With this quote, a new approach to the entrepreneurial firm and the dimensions of such, started to emerge in strategic management research. Covin and Slevin (1989) investigated the firm performance related to the, so called, *entrepreneurial strategic posture* (later to be developed and given the name of EO) holding the dimensions of proactiveness, innovativeness and risk-taking, of small firms in a hostile (highly competitive) environment.

These dimensions corresponds to the quote by Miller (1983) explaining that the dimensions of proactiveness and innovation within the entrepreneurial firm '…is first to come up with 'proactive' innovations', while risk-taking refers to 'an entrepreneurial firm…undertakes somewhat risky ventures' (Miller, 1983, p. 771). Thus, the entrepreneurial firm is seen as a combination of the key dimensions discussed; proactiveness, innovativeness, and risk-taking (e.g. Covin & Slevin, 1991; Miller, 1983; Wiklund, 1999, 1998; Zahra & Covin, 1995; Wiklund & Shepherd, 2003, 2005, 2005B).

As a result, empirical research of the EO scholars has for long explored these dimensions. In 1996 Dess and Lumpkin (1996) suggested two other dimensions (*competitive aggressiveness* and *autonomy*) to be added in the construct of EO, and also an environmental element as a response to research showing that the firm-level EO-performance is not only dependent on the fit between EO and strategy, but also environment and the structure of the firm. That is to say, the external environment and its hostility was added as an element and was therefore not only of given nature for firms (as, for instance, the research of Covin and Slevin (1989) indicated by investigating the *entrepreneurial strategic posture* in a *hostile*

environment). Competitive aggressiveness was suggested by Dess and Lumpkin (1996) as an addition to the EO construct, referring to …*beating the competitors to the punch* in the classical quote by Miller (1983). Also, in regard to the importance of the organisational structure in which new ideas is initiated and marketed, autonomy was added (Dess & Lumpkin, 1996).

Even though Dess and Lumpkin (1996) suggested adding the dimensions discussed, in the academic world, the dominating view of EO is as a construct of innovativeness, pro-activeness and risk-taking (e.g. Wiklund, 1998; Shepherd & Wiklund, 2005; 2005B).

While competitive aggressiveness was not added to the EO framework for the present study due to space limitations, and the intention of focusing on the internal aspects of the firm, autonomy was added due to several reasons. Firstly, it is the intention of the authors to also include the dimension of autonomy, since one might suspect the affect of autonomy on growth in a highly dynamic market in a developing economy. Furthermore, since layers of bureaucracy and organisational tradition is suggested to impede innovation and entrepreneurship (Kanter, 1983, cited in Dess & Lumpkin, 1996), the authors believe that the dimension of autonomy is of interest in the developing nation of Sri Lanka because of its hierarchical tradition. Below follows a brief discussion regarding the different dimensions concerning EO in the present study.

2.4.1.1 Innovativeness

The importance of innovation has for long been recognized as a component of entrepreneurship, economic development, strategy, etcetera (e.g. Wennekers & Thurik, 1999; Schumpeter, 1942; Mintzberg, 1998). Schumpeter (1942) emphasized innovation in the construct of *creative destruction*[1] and in the process of creating *novel combinations* with *existing resources*. Since then, innovation has been an important factor characterizing entrepreneurship. In the context of EO, the dimension of innovativeness reflects the tendency of the firm to move beyond established practises and technologies through supporting *new ideas, novelty, experimentation* and *creative processes* (Shepherd & Wiklund, 2005, p. 82). This can take many forms. The most obvious is the result of intense R&D, but this is also the case in less obvious innovation-led activities such as market research and marketing. Thus, innovation takes many forms and is a central component of EO since it reveals through which means firms reaches the goal of pursuing new opportunities and grows.

Exploiting innovation and opportunities effectively is of great importance to create competitive advantages. Furthermore, Dess and Lumpkin (2005) argue that even if not all produced inventions or innovations might be developed into a product or service, they still need to be nurtured. 3M, for instance, constantly strive towards stimulating entrepreneurship so to exploit new opportunities and innovations. Every aspect of 3M, such as policies and management approach, functions so to internally develop new ventures. Even though far from all new ideas ever reach the market, the ones that do actually contribute to the exceptional performance of the company. It should be remembered though; that although 3M is a great example, the focus on high R&D expenditure might be devastating for a firm if not the effort pays off (Dess & Lumpkin,

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[1] Schumpeter (1934, 1942) explained the process of industrial transformation as a process of creative destruction, or a disequilibrating force, holding that innovations replaces obsolete production techniques and products.

2005). Innovation also has some implications for structure (in terms of managerial approach, and policies), but structure might equally constrain innovation (Miller, Dröge, Toulouse, 1988). This will to some extent be discussed in the dimension of autonomy further down.

2.4.1.2 Proactiveness

On the other hand, the dimension of proactiveness reflects the firm's eagerness to act on future trends, needs and wants, and to seize new opportunities (e.g. Shepherd & Wiklund, 2005; Dess & Lumpkin, 1996, 2005). Two methods to promote proactiveness on a firm-level include; (1) introducing new products or technological capabilities before the competition, and (2) continuously seek out new product and service offerings (Dess & Lumpkin, 2005). According to Zahra and Covin (1995) proactive companies' can, for instance, initially charge high prices in order to skim the market, and furthermore create first-mover advantages. This is especially important in the pre-maturity phases of the industry's life cycle. Moreover, this can be used so to control the market by controlling distribution channels, and establish a brand before those of the competition (Shepherd & Wiklund, 2005). However, to make use of the first mover advantages, it is of importance to actually understand the market, and when it is ready for the new offering to be introduced. On the idea of acting on anticipated future demand and being first on the market, Dess and Lumpkin (2005) argue that the importance of being first on the market is a narrow approach. Based upon findings by Miller and Camp (1985), they argue that a firm can be *novel*, *forward-thinking*, and *fast* without being first (p. 146), and also, the second firm to enter is as much likely to achieve successful outcome through proactiveness, and is just as pioneering as the first firm to enter.

Furthermore, Dess and Lumpkin (2005) argue that monitoring and scanning the environment and its trends, together with extensive feasibility analysis, are crucial. Generally, the dimension of proactiveness is an effective tool in creating competitive advantages because the competition ought to react on successful initiatives. Hence, the firm engaged in EO and proactive actions, is rather a *leader of change* (as suggested in strategy literature) than a *taker of change* (or followers/ rule takers), due to the 'will and foresight to seize new opportunities, even if it is not always the first to do so' (Dess & Lumpkin, 1996, p. 146).

2.4.1.3 Risk-taking

The third dimension, namely that of risk-taking, is in general concerned with the willingness of the firm to move beyond the already established and *tried-and-true* (methods and products that have worked in the past) so to explore the unknown (Shepherd & Wiklund, 2005). More concretely, this implies the firms' level of committing resources to projects where the outcome is either unknown or to those where the cost of failure might be high. While the tried-and-true strategies might lead to high efficiency, breaking away from this into more risky strategies might lead to better long run performance and results (e.g. Zahra & Covin, 1995; Covin & Slevin 1991).

However, as noted by Dess and Lumpkin (2005), risk-taking is not about gambling. In line with the initial definition of the entrepreneur as a risk-taker made by Cantillion in 1755, the entrepreneur does not gamble but rather fundamentally understand the chances of success, thus, minimizing risk. This is further consistent with Drucker (1985) who argues that successful entrepreneurs (or intrapreneurs) minimize the risk through understanding it thoroughly, and focuses upon the opportunity. Through scenario development, firms

engaged in corporate entrepreneurship investigate the different likely outcomes, in order to reduce the risk and ease the decision making.

Dess and Lumpkin (2005) identified three common risks that faced organisations and their executives; business risk-taking (to venture into the uncertain without having a full picture of the likeliness for success), financial risk-taking (the financial commitment), and personal risk-taking (referring to the strategic risk of executives, their impact on the company, and their own carriers).

To some extent, all dimensions of EO concerns risk-taking. However, this specific dimension concerns the uncertainty that firms on the path of corporate entrepreneurship faces, and the commitment to act even though if the consequences of the actions are unknown (Dess & Lumpkin, 2005).

2.4.1.4   Autonomy

The autonomy dimension of the EO construct refers to the structure within an organisation in which the actions and processes take place in order to utilize an idea. It is the process and action of an individual or team bringing fourth an idea until the completion of such. That is to say, the pursuit and exploitation of an opportunity and the ability of individuals within the organisation to make it happen. In the context of the organisation, autonomy concerns the structure of the firm and its direction towards stimulating entrepreneurship, promoting novel ideas and initiatives so to capitalize upon new opportunities. This implies that initiatives and actions can take place without any organisational constrains (Dess & Lumpkin, 1996).

Thus, even though the organisation with its internal organisational considerations and factors, such as resource availability, might impact the new venture initiative, it does not influence the process of the autonomous entrepreneur negatively. In the internal new venture process, the player within the organisation, therefore, has freedom to act on an independent basis, make the key decisions, and influence the process to proceed or not (Dess & Lumpkin, 1996).

If reviewing strategic management and entrepreneurship literature, autonomy is discussed in the context of the behaviour. In the work of Mintzberg (1998) of the ten schools of thought, he described the leader in the entrepreneurial school of thought (entrepreneurial strategy-making mode) as the player taking the key-, and risky actions. Furthermore, the vision and the strong leadership exercised by the leader are central, and impact the behaviour of the organisation greatly. The type of autonomy discussed here, is often most common in small firms, in which the owner or manager is the driving force behind the organisation (Dess & Lumpkin, 2005; Mintzberg, 1998).

In contrast, Hart (1992) argued that strategy making occurs from the entrepreneurial activity, passing the new ideas through the different levels of management, highlighting the dimension of freedom to act independently even further. Thus, suggesting that strategy is initiated by individual entrepreneurship of organisational members. This discussion reflects the importance of autonomy in the internal corporate new venture creation, and also indicates that often new ventures are not initiated by managers but by the lower levels in the organisation, seizing the capacity of the organisational competence and its members. Therefore, it is not surprising that the most successful corporate entrepreneurial companies

(e.g. 3M and Virgin[2]) do not have pure hierarchical levels, but use a bottom-up approach to stimulate entrepreneurial activity (Dess & Lumpkin, 1996; 2005).

To conclude, the previous discussions implies that the autonomy in an organisational context vary as a function of size of the firm, the style of management, and ownership. In smaller firms, there is a tendency that the autonomy is centred around the leader and *implied by the rights of ownership* (Dess & Lumpkin, 1996) since the manager/owner is the primary decision maker, whereas in larger firms autonomy is present as a function of structure, such as flat hierarchies. However, in larger firms, it takes more than just pure organisational design. Also, it is vital to grant the autonomy for the organisational members to exercise corporate entrepreneurship (e.g. Hart, 1992; Pinchot, 1985; Dess & Lumpkin, 1996).

Based upon a wide range of previous research, Dess and Lumpkin (1996) conclude that it is the impetus of freedom that allows the individual or team to exercise creativity, and develop new promising ideas. This freedom and spirit of independence in the organisational structure is necessary for entrepreneurship to flourish, hence, internally new venture development.

2.4.1.5 Discussion of entrepreneurial orientation

The dimensions discussed above together make the construct of EO. In the present world, where dynamics markets, shortened product and business life-cycles, and hostility are the very nature of many markets, EO can assist businesses to enhance the performance through seeking and capitalizing upon new opportunities (Wiklund, 1999; Shepherd & Wiklund, 2005; Zahra & Covin, 1995).

Furthermore, Lumpkin and Dess (1996) raised arguments that the different dimensions of the EO construct vary independently. However, initially, before any empirical findings has been investigated, the authors will treat the various dimensions as a single construct since empirical findings (e.g. Covin & Slevin, 1989; Wiklund, 1998; Shepherd & Wiklund, 2005) indicates that the three dimensions of innovativeness, risk-taking, and proactiveness co-vary with each other. Thus, this seems to divide the research on EO into two streams of research; those who follow the construct suggested by Lumpkin and Dess (1996) holding not only the three dimensions as suggested by Miller (1983), but also competitive aggressiveness and autonomy and those who follow the initial EO construct as initially was suggested by Miller (1983), later Covin and Slevin (1989).

In the present study, the authors agree with the original construct of EO as presented by Covin and Slevin (1989) but have also chosen to add the dimension of autonomy because of aforesaid arguments. And furthermore, the authors rely upon the major stream of research arguing that the dimensions co-vary. For instance, R&D in a technology based firm results in a complete new technology generating a new high-tech product, and decides to introduce it in the marketplace. The company clearly takes a risk when introducing the innovation because of the novelty and unknown demand for the product, while the venture at the same time acts proactively as long as the competition does not introduce similar or the same products at the same time. This example leads us to accept EO as a joint construct until it has been tested in the study, as previous research has staked out. In conclusion, the view of EO in the present study includes the dimensions of innovativeness, proactiveness, risk-taking and autonomy.

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[2] See Dess and Lumpkin (2005) for a discussion concerning 3M and Virgin Group

2.4.2   Entrepreneurial orientation and environment

In an empirical based framework for mapping corporate entrepreneurship the environment is identified as a major factor impacting corporate entrepreneurship (Guth and Ginsberg, 1994) since the environment *poses an element of uncertainty to organisations* (Dess, Lumpkin, Covin, 1997, p. 680). The posed environmental uncertainty depends on the dynamism, heterogeneity and hostility characterising the industry (Miller, 1983; Miller & Friesen, 1982). Various empirical findings support the impact on an industry and its firms due to major environmental shifts such as market deregulation, which in turn influences the strategies on a firm-level in a non-random way as concluded by Zajac and Shortell (1989).

Furthermore, Miller (1983) concluded that the environment is shown to have several significant relationships with entrepreneurial activity. The more the environment is hostile and dynamic, the more will firms act entrepreneurially. Also, his findings further indicates that the more 'technocrats' the industry has, the more entrepreneurship is present strengthen the link between environment and entrepreneurial activity further. The findings by Miller (1983) has also gained various empirical support, e.g. Covin and Slevin (1989), who concluded that small firms obtain higher financial performance in a hostile environment if holding an *entrepreneurial strategic posture* (which EO is based upon).

Moreover, Cooper (1979) identified that also the structure of an industry affects entrepreneurship since small firm R&D in a high tech environment generates higher spin-offs than large firm R&D activity. Thus, new ventures are created in order to exploit and capitalize upon opportunities previously foreseen, unidentified or unexploited. According to Cooper (1973) this was due to that small firm employees gain a product and market focus rather than a *narrower functional focus* which is more common in a large firm context (cited in Wave, Cooper, Cave, and Lucas, 2005). Furthermore, Khandwalla (1987) (cited in Dess *et. al* 1997) found generators for pioneering and innovation in high tech industries to be strongly linked with the success of cooping with environmental uncertainty through the by EO suggested dimensions of risk-taking, proactiveness, and innovative behaviour. This stresses further the dimensions of EO as both relevant and important in order to cope with environmental uncertainty and generating above-average growth.

Generally, environmental uncertainty in terms of dynamism and hostility is positive associated with strategic innovation (e.g. Miller, 1983; Miller, Dröge & Toulouse, 1988; Dess *et. al* 1997) and firms adopting an entrepreneurial orientation (or entrepreneurial posture) performed superior than those of the competition (Covin & Slevin, 1989; Zahra and Covin, 1995).

As concluded by Guth and Ginsberg (1994) it is clear that the structure of the competitiveness in an industry and the underlying level of technology affect opportunity exploitation and corporate entrepreneurship. They further argue that opportunities and problems derive from the potential of the industry firms to create new combinations of resources leading to competitive advantages.

Other important environmental forces affecting the potential for an industry to succeed are macro forces. Although at a general level, the PESTEL model describes these well (Johnson & Scholes, 2002). The political, economic, social, technological, environmental and legal environment of a firm plays a crucial role in the actions it can take and the resource it can gain access to. For example, incentives from governments in Europe to increase competitiveness during the last 20 years have taken expression in deregulation of telecom markets and the breaking of other common state monopolies (Bonardi, 2005).

In the present study environment will be viewed and measured through its hostility. Hostility can be defined as 'high levels of competitive intensity, a paucity of readily exploitable market opportunities, tremendous competitive-, market-, and/or product-related uncertainties, and a general vulnerability to influence from forces and elements external to the firm's external environment' (Zahra & Covin, 1995, p. 48), thus naturally holding elements of environmental uncertainty, dynamism, and heterogeneity. Therefore, hostility can be seen as a label for these elements. Hence, the component of environment in this thesis is measured through its hostility.

2.5   The research model of this study

In this section, it is the intention of the authors to integrate the theoretical perspectives discussed into a research model. As stated by Wiklund (1998), it is close to impossible to integrate all the perspectives (strategy, resources and capabilities, environment) reviewed in empirical research. However, based on the theory and with help from the research model, some hypothesises will be made to be tested with quantitative data. Further depth in the areas will be further gained by the qualitative interviews conducted and by secondary data collected.

2.5.1   Entrepreneurial Orientation and Strategy

EO concerns the strategic and behavioural orientation of a firm, and its four dimensions involves 'willingness to innovate to rejuvenate market offerings, take risks to try out new and uncertain products, services, and markets, and to be more proactive than competitors towards new marketplace opportunities' (Wiklund & Shepherd, 2005, p. 75). As the general tendency in the market nowadays indicates shorter product life cycles (e.g. Hammel, 2000), based upon the quote above, there is reason to believe that a strategic orientation of EO can assists firms in such a process. Therefore[3];

Proposition 1: EO has a universal positive affect on growth.

As the software industry in the introduction and in the background section is described as one with high dynamism, rich in innovation and opportunities, the following is believed:

Proposition 2: The software industry at a general level has high levels of EO (due to the nature of the industry).

2.5.2   Resources and capabilities

First of all, the background chapter presents a picture of Sri Lanka as a developing nation, carrying constrains in terms of infrastructure and resources that comes with this. Therefore our first hypothesis must deal with the access to resources on a general basis:

Proposition 3: Most firms will experience a shortage of resources at a general level.

According to the RBV, the firms being able to best use their unique resources will find an advantage to their competitors, and thus perform better. Our next proposition is thus as follows:

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[3] All propositions presented deal specifically with the software industry of Sri Lanka.

Proposition 4: Firms with high access to resources will grow more (perform better) than the other firms within the industry.

Because of the strong link between EO and knowledge-based resources, the relationship between these two must be investigated.

Proposition 5: There is a relationship between knowledge based resources and the level of EO.

As stated by Covin and Slevin (1991), the strategic orientation of EO is resource-consuming. Also, it is found that firms, especially in a SME context, have a great need of financial resources (Wiklund & Shepherd, 2005). Hence, if greater financial resources are available, this might stimulate risk-taking since a prospect project might not hold firm bankruptcy if it fails, which in turn stimulates innovation and proactiveness. Therefore, access to greater resources in general, and especially financial ones, impact the level of EO.

Proposition 6: There is a relationship between financial resources and the level of EO.

2.5.3 Environment

To continue, the very nature of the IT-industry is said to be dynamic. Therefore, as a result of the very definition used of dynamic, it leads to the following proposition:

Proposition 7: The firms in the Sri Lankan software industry will experience their environment as hostile.

As a result of the dynamism, strategy is in theory described as needing to be flexible and the use of innovativeness needs to be applied. This calls for a relationship between market hostility and EO:

Proposition 8: Firms experiencing their industry and markets as dynamic and hostile will have a stronger tendency to use EO.

2.5.4 Summery and research model

The discussion and examined theories throughout the present chapter identify and integrate the different theoretical constructs. All this leads us down to the research model in this study, presented below:
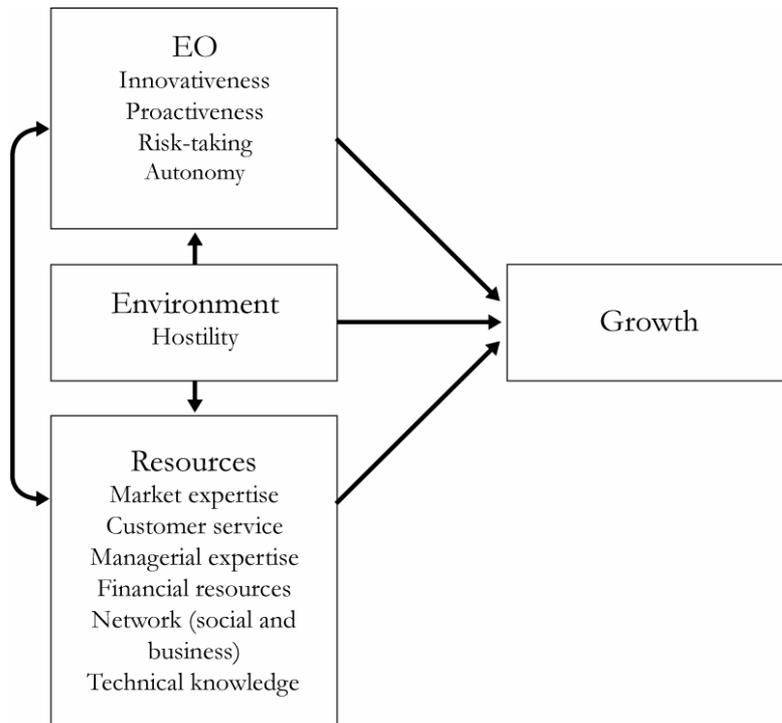
Figure 2-3 Research model

The purpose of the present study is to examine the relationships between resources, EO, perceived environment and ultimately growth. Out of the theoretical discussions (previous empirical based research), and guided by the research questions and purpose, one might expect different relationships that are presented as propositions. The research model will be of guidance in this process of examine the relationships, and it also summarises the different constructs of the theoretical framework.

- The EO construct reflects a firm's strategic entrepreneurial behaviour, its strategic orientation, and is measured through four variables:

  o *Innovativeness* refers to the tendency of the firm to move beyond established tried-and-true practises and technologies. As argued by Shepherd and Wiklund (2005) this can be conducted through supporting *new ideas, novelty, experimentation* and *creative processes* (p. 82).

  o *Proactiveness* is the dimension of the EO construct reflecting the eagerness of a firm to seize new opportunities through acting on future needs, wants and trends (Shepherd & Wiklund, 2005). Dess and Lumpkin (2005) further argue that two methods can be used to promote proactiveness, namely (1) To introduce new products/services before those of competition, and (2) continuously seek out new product and service offerings (Dess & Lumpkin, 2005).

  o *Risk-taking,* on the other hand, refers to the willingness of a firm to explore the unknown in terms of committing resources to projects in which the outcome is either unknown or the cost of failure high. Dess and Lumpkin (2005) talks about three risks a firm might phase in regard to the dimension discussed, (1) business risk-taking, (2) financial risk-taking, and (3) personal risk-taking.

- o *Autonomy* concerns the fourth bringing of an idea, from its initiation to the completion, and the organisational context in which the action takes place. Thus, an organisational structure aiming at stimulating entrepreneurship avoiding organisational constrains (Dess & Lumpkin, 1996).

- The construct for resources and capabilities deals with the above outlined resources of market expertise, customer expertise, managerial expertise, financial resources, networks and technical expertise (including expertise in product and service development). It is based on the discussion of the resource based view, and can all play an important role in creating competitive advantage.

- Moreover, as suggested in previous empirical research (e.g. Miller, 1983), the perceived environment in which a firm operates impacts the level of entrepreneurial behaviour. As concluded by Miller (1983), firms act more entrepreneurially if the environment is hostile and dynamic, than inert. Furthermore, Covin and Slevin (1989) further concluded that small firms holding entrepreneurial strategic posture (or EO) achieve better financial performance in a hostile environment.

Guided by the above discussed theory, in the next chapter the authors will present the methodological approach for exploring and investigating the proposed research model.

3   Methodology

In this chapter the authors will present and motivate for the choice of method and how this study has been conducted.

There are a number of decisions to be taken when conducting empirical research. The actual topic of research; *what is to be studied (?)*, the basic scientific position; *from which standpoint do the authors conduct their research (?)*, etc. It is not only a question of the data collection method, neither the means to the goal of answering the purpose is of qualitative or quantitative nature. It is a more profound inquiry. This chapter discusses and motivates these decisions based upon the purpose of this study and the research questions formulated.

In order to decide upon which central method to use, Saunders, Thornhill and Lewis (2003) argues that there are important layers of the research process (see Figure 3-1 *research process 'onion'* below) that need to be *peeled away*. The chosen method for the present study holds both a quantitative- and a qualitative part. In the quantitative study, which shall be considered as the main component, data has been obtained through questionnaires, whereas in the complementary qualitative study, interviews with 8 persons within the Sri Lankan software industry have been conducted. It is the purpose of this chapter to peel away the layers to enable the reader to understand why the methodological approaches were chosen, and how the authors conducted the study.
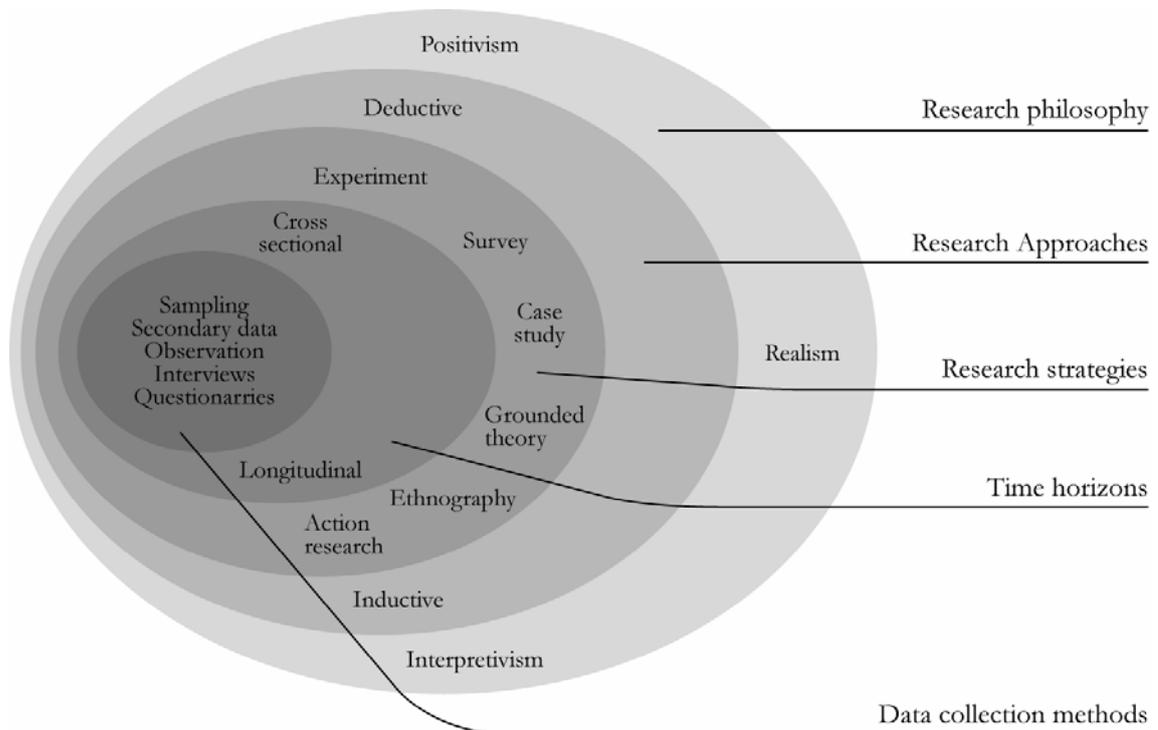
Figure 3-1 The research process 'onion' (Saunders, et al, 2003, p 83)

The first of the layers concerns the scientific point of departure, the research philosophy, while the second layer deals with the subject of the research approach. These are then followed by the research strategy. Fourthly, time horizon of the study is considered

followed by the actual data collection method. This is also consistent with the outline of this chapter.

3.1   Research philosophy

The research philosophy is the scientific point of departure, and concerns the way the researcher think about the development of knowledge. Saunders *et al* (2003) further argue that the development of knowledge in turn affects the way we do research. Even though the impact of the over-all phenomena of scientific philosophy in a master thesis can be dubious, it is of importance to understand the very foundation that underlies scientific results, from which knowledge is gained. Therefore, it is the belief held by the authors that it is essential to discuss different scientific views in order to create an understanding of the scientific standpoint taken in this study.

There are several *scientific approaches* or *schools of thought* about the research process of how knowledge could or should be generated (Saunders *et al*, 2003; Widerberg, 2002; Alvesson & Sköldberg, 1994). Often a discussion regarding scientific approaches is limited to the schools of positivism and hermeneutics. However in literature, the three views that dominate the area are positivism, hermeneutics and realism. These views of how knowledge emerges are not completely mutually exclusive in all aspects, but rather overlap one another (Widerberg, 2002).

When discussing the methodological approaches positivism and hermeneutics can be explained as the opposite poles of each other. According to Wiklund (1998) positivism has a strong influence on scientific discussion since most discussions are carried out in relation to positivism.

Positivism holds the viewpoint of objectivity - *the researcher is independent of and neither affects nor is affected by the subject of the research* (Remenyi, Williams, Money, & Swartz, 1998, p 33), control and distance, and further stresses that all data and knowledge is measurable (Alvesson & Sköldberg, 1994). Therefore, the emphasis in this scientific philosophy is on highly structured methodology in order to facilitate a replication of the study, and quantifiable observations, thus the positivist functions as a statistical analyser (Saunders *et al*, 2003).

A positivist therefore looks upon him/herself as a researcher in an observable reality where the results of the research can be seen as *law-like generalisations* (Remenyi *et al*, 1998). Therefore, the truth is what we see. Nothing is hidden beyond what actually can be interpreted and understood (Carlsson, 1990). Hence positivism is a belief in which the followers believe in 'a' truth and that the truth is completely observable. This implies that from a strict positivist standpoint, a theory and knowledge about unobservable particles cannot be accepted (Wiklund, 1998).

There are a number of relevant, significant and powerful arguments against a pure positivistic standpoint as a scientific philosophy. The authors' viewpoint on research does not fully agree upon the one of positivists. I.e. if a pure positivistic approach would be the accepted truth, the business and management world would be determined by a number of definite and observable laws. The authors argue that the business world is too complex and each business situation too unique to take such an approach. Though, the authors do believe in the existence of underlying 'laws' which are more or less true and more or less observable in the business environment. However, positivism is excluded as the foundation of the present study.

On the other hand, a hermeneutic approach is more concerned with interpretations and understanding of the studied area. It concerns the pre-understanding of the studied phenomenon based on the idea that a *part* can only be understood in relation to the *whole* (Alvesson & Sköldberg, 1994). Hermeneutics also stresses that the pre-understanding of the researcher influence the questions, and the information (answers) the researcher aim to obtain. Thus, the researcher has a vague idea of the phenomenon intended to explore beforehand, and the research process is a back- and forward jiggling between the studied *part* and the *whole*. Logically, this approach is of more qualitative nature rather than quantitative – as in positivism – and is used most frequently in the field of social sciences (Eriksson & Wiedersheim-Paul 1999).

Eriksson and Wiedersheim-Paul (1999) also stresses the importance of communication, language and the researchers understanding of the undertaking of the studied object (person) in the hermeneutics. This is both obvious and logical in this approach. Hermeneutics highlight the pre-understanding and its affect on questions formulated (and thereby the answers), which the authors also believe is of great importance. However, considering the present study's purpose of testing and exploring strategic theory, a quantitative study would be more suitable since it is aimed at generalising the result for the whole population (the software sector in Sri Lanka).

Scientific realism is another view of scientific philosophy, which has a lot in common with positivism, although it holds important differences as well.

A key in scientific realism, just as positivism, is that the world is independent of our knowledge about it. And the role of science is therefore to *gain knowledge about an objective world, not a world dependent on our interpretations of reality* (Wiklund, 1998, p 75). This lead down to an important aspect of scientific realism pointed out by Boyd (1984); scientific theories about the reality can be confirmed as *approximately* true. This has also been stated by Wiklund (1998), and determines that this point is a major difference to the positivist point of view. Instead of having a firm opinion that a phenomenon is the truth, a scientific realist does not exclude the fact that *the truth* might be developed and slightly changed over time (Wiklund, 1998).

Some important beliefs of scientific realism will have an impact on this present study. Firstly, the scientific realists believe that knowledge is cumulative, in other words knowledge is snowballing. This point out the importance of having a close review of theories within the researched area in order to extend the general knowledge about a phenomenon. The relevance of the theories therefore is important and due to this, it is important for a researcher to be explicit about choices made and having an open mind towards other possible explanations (Wiklund, 1998).

Secondly, scientific realism holds that the existing theories are determined through testing them against empirical data. In order to test the power of prediction and/or explanation it is necessary to test them repeatedly, it is necessary to use quantitative data and therefore testing the theory through statistical exploring the relationships comes into play as well (Wiklund, 1998).

Considering the purpose and research questions of this study, the scientific standpoint in this research leans towards positivism rather than hermeneutics, but in some significant aspects the authors sympathise with the view of scientific realism. Saunders *et al* (2003) also highlighted that business and management research often is a mixture between positivism

and hermeneutics, and maybe reflecting position of realism. The present case also confirms this.

The nature of positivism further consists of distancing oneself and conducting an objective analysis (Remenyi *et al*, 1998). Considering this in the light of scientific realism, it is not contradictory, rather overlapping.

Further, both positivism and scientific realism heavily relies on quantitative methods, and stresses the importance of highly structured methodology with statistical analysis as the result. However, due to some basics beliefs: the intention to mainly focus upon carrying out a quantitative survey, the importance of being able to generalise the results (at least to some extent), the authors consider the present study as of a realist's sympathising with scientific realists rather than positivists due to differences in elementary viewpoints discussed. Especially it is the belief of the authors only to accept theories as approximately truths since it is a fact that theories are developed and slightly changed over time. Therefore, the viewpoint that nothing is hidden behind what is observable is rejected since the world is far more complex than that. Thus, some hermeneutical approaches will be included to provide for deeper understanding and exemplification of the results derived through scientific realism. It is further the conviction of the authors that scientific realism provide guidelines in the finding the most suitable method in order to fulfil the purpose of the present study, and therefore base the study mainly on the scientific philosophical though of scientific realism.

3.2   Research approach

The above discussion raises the question of the research philosophy adopted in this study, which leads down to the actual research approach to decide upon. This is of importance since the chosen method influence and determines the manner (and methodological structure) in which data is collected, and analyzed. The method chosen is in turn based upon the researchers' scientific philosophy and the purpose of the study (Saunders *et. al*, 2003). Therefore the discussion below should be viewed as a follow-up of the philosophic standpoint taken.

Generally there are two main approaches to research. As can be seen above in the research process 'onion' (Figure 2-3) these two courses of action are; *inductive* and *deductive*.

An *inductive* approach implies that theories will be developed as a result of a data collection, meaning that the researcher build the theory based on empirical findings. In this approach the empirical data is the starting point, whereas a *deductive* approach implies the opposite (owing more to positivism), an approach with its origin in the theory. That is to say that predictions can be made out from already existing theories and these predictions is later to be tested (Saunders *et al*, 2003; Eriksson & Wiedersheim, 2001). Hessey and Hessey (1997) express deduction as a research approach where 'laws provide the basis of explanation, permit the anticipation of phenomena, predict their occurrence and therefore allow them to be controlled' (Hessey & Hessey, 1997, p. 52). Naturally, the present research owes more to deduction than to induction.

Robson (2002) suggest that deductive studies will be progressed through a list of five sequential stages, which also has been conducted in the quantitative component of the present study (please see section 2.6 for propositions deducted from the theory presented in frame of references):

1. Deducing a hypothesis from the theory

2. Expressing the hypothesis in operational terms (that is, ones indicating exactly how the variables are to be measured), which propose a relationship between two specific variables

3. Testing this operational hypothesis (this will involve an experiment or some form of empirical inquiry)

4. Examining the specific outcome of the inquiry (it will either tent do confirm the theory or indicate the need for its modification)

5. If necessary, modifying the theory in the light of the findings

Considering methodological approaches further, it is also of importance to highlight the two main methods when investigating and collecting data – quantitative and qualitative. Generally, a quantitative approach is strongly linked to *deductive* testing of theories through hypotheses, whereas a qualitative approach to research generally is concerned with *inductive* testing (Saunders *et al*, 2003; Eriksson & Wiedersheim, 2001).

The differences separating a qualitative research approach from a quantitative one lies in the manner of data collection and data analysis. While qualitative research concerns an in-depth analysis of a small sample, a quantitative study uses formal measurements in order to be able to objectively interpret and analyze the data of a larger sample. The nature of a large sample study holds that through well-established statistical means, one is able to reach the goal of generalization of the whole population (Patel and Davidson, 1994).

Also, in qualitative studies, the data collected is hard to quantify (often referred to as soft data), whereas easy to do so in quantitative studies. Even though this approach has its strengths in deep understanding of a specific subject, there are major downsides as well. The two major ones are; the narrowness of knowledge, and the question of objectivity of the researcher (since the researcher is exposed to the likelihood of being influenced of the situation from which the data is gained). On the other hand, the downsides of the qualitative data are the strengths of a quantitative study. Even though it can be argued that deep knowledge usually is not gained through a quantitative study, the large number of investigated objects, and quantifiable data, usually enables the researcher objectively interpret and generalize the results to a significantly higher level than a qualitative study (Alvesson & Sköldberg, 1994).

Furthermore, given the purpose of this thesis, the most suitable research approach owes more to *deduction* and is of *quantitative* nature since the authors are moving from theory to data rather than the opposite. Moreover, given how our philosophical standpoint of science views the development of knowledge - modifying and develop theories along the way in order to move closer towards the truth – it is expected to use the research approach discussed.

A quantitative approach will provide the objectivity – since personal interpretations, to a high extent, are avoided (Alvesson & Sköldberg, 1994) – and the generalisability wished for is taken into consideration (Eriksson & Wiedersheim-Paul, 1999). Also in line with the view on philosophy of science in this thesis, the approach chosen for this study is concerned with a statistical analysis of the empirical findings, based on a well structured method, pre-determined questions, and conceptual framework (Patel and Davidson, 1994).

However, even though the main focus of the present study is quantitative, it is also the intent of the authors to perform a small qualitative study in order to gain a better understanding of the Sri Lankan software industry, and possibly enabling better and more insightful interpretation of the results from the quantitative study. Thus, even if the quantitative- and deductive approach shall be seen as the major component, a qualitative- and inductive approach is also taken to weight up the downsides of a quantitative study in order to generate the best study results possible and also allow providing examples from real life (Svenning, 2003).

3.3 Research strategy (time and quality horizons)

In order for the research to capture a realistic picture of what is being studied the choice of research strategy has to be right. Translating research problems and theory into concrete instruments of measure, such as surveys or observation protocols, has always been the shadowing problem over empirical research. However, without the connection between the theoretical and the empirical levels, research becomes meaningless. Usually this connection is referred to as *validity,* as it determines how well you measure what is intended to measure (Svenning, 2003).

Another classic problem within social science and/or business research is to achieve as high reliability as possible. A lot of factors can affect the research, where the most common is that the survey or other instrument of measure is not accurate. However, other factors such as the interviewer, the environment at which the interview takes place and the trustworthiness of respondents can contribute towards a lack of *reliability*. If nothing changes in a population, two studies with the same purpose and the same methods should give the same results. That is a classic definition of the term reliability (Svenning, 2003).

As discussed in the previous section, the authors intend to test existing theory in a perspective of a developing nation. The authors have no prior knowledge to the relationships that are going to be tested on the sample. As the authors intend to gain a holistic understanding, the only valid method for generalizing is as mentioned above, a quantitative approach. However, given the downsides of a quantitative approach, also a qualitative study will be conducted so to gain more in-depth knowledge enabling a deeper interpretation of the results of the quantitative study. The table below shows a brief comparison between the types of outcome between a quantitative and qualitative study:

Quantitative Studies	Qualitative Studies
Answers 'How many?'	Answers 'Why?'
More precise	More sensible
Generalises	Exemplifies
Strives for reliability (reproducible)	Not necessarily reliable
Strives for validity (to measure what is intended)	Strives for validity

Table 1: Differences between qualitative and quantitative studies (Svenning, 2003, p. 73)

A quantitative study may have as its purpose to describe reality through a set of variables. To test this set of variables, a random sample from the population of interest is drawn. This type of study is often referred to as descriptive studies. Explanatory studies do not have as its purpose to give a simple explanation of reality. Instead its purpose is to describe how things are connected. In other words, one examines how variables interact, coexist or influence each other (Svenning, 2003).

Thomas (2004) offer two different research tools for quantitative studies: experimentation or surveying. Likewise Saunders, *et al* (2003) presents the options of observation or using questionnaires. A classic example of the experimentation/observation method is Milgram's studies of authoritarian behaviour and torture (Svenning, 2003). However, for the purpose of this thesis, it would be impossible to use observation as a viable method. Instead the authors have chosen to use the survey, as it is a useful tool to gather information on a wide variety of topics (Thomas, 2004).

Using a survey as the tool for testing theory on a sample, the distinction between descriptive or explanatory aims has to be made (Thomas, 2004). While surveys conducted by government or businesses for market research purposes often focus on the former type, business and management studies usually intend to find links between variables, thus the latter one. Gill and Johnson (1997) highlight the importance of understanding the different research requirements for these two types of purposes. Following this, and with the purpose in mind, the present thesis will mainly be of explanatory character, but naturally descriptive analysis will be used to illustrate general information of the industry (size, age, etc.).

The details of the survey will follow in the coming sections, but here a outline of the stages in conducting a survey are presented (Thomas, 2004):

1. Define population

2. Obtain/construct sampling frame

3. Decide sample size

4. Choose sampling method

5. Define survey content

6. Decide method of delivery: self-completion questionnaire, face-to-face interview, telephone interview, internet survey

7. Design survey instruments: questionnaires, interview schedules

8. Design incentives: financial, material, normative

9. Conduct pilot study

10. Amend survey methods

11. Deliver survey

12. Edit responses

13. Analyse and interpret results

Saunders, *et al* (2003) presents similar steps, and states that large-scale quantitative surveys are not often conducted in business research, but small scale quantitative surveys is a normal way for degree research.

In the present study, these steps have been considered as guidelines. Following this, the strategy for conducting the research was first to identify the firms present within the Sri Lankan software industry. Using that base, the authors sampled the population of firms. Since information can be assumed was limited in some cases, the authors accounted for some minor delimitations as the progress goes along.

Firstly, the authors identified the population of Sri Lankan software industry which consists of about 100 firms. This is a rather small population, and therefore the authors decided to attempt to survey as much of this population as possible. Mr. Rajkumar Ganeshan (personal communication, 2006-03-23) of Lanka Software Foundation, mentioned that only about 50 of these firms were truly interesting (personal opinion), and these could be found if approaching the two leading industry associations, Software Exporters Association (SEA) and Sri Lanka Association for Software Industry (SLASI). Also, this enabled a higher quality of the respondents since shoestring companies most likely would not be a member of these associations. Contact was initiated with the organisations, and access to their member registers was granted, allowing for the authors to compose a list of 91 firms. 18 of these were non-servable due to closures, and assumed wrong firm information held by the industry associations, leaving us with a sample in total of 73 firms (please see appendix 7 for the complete list of firms).

The sample of interviewees were randomly chosen based on their time and availability for a meeting. As it turned out, the firms interviewed were firms that had experienced moderate to rapid growth for the last three years, proving useful objects for the purpose of this thesis.

In common the sample all had that they were represented and run from Sri Lanka. Their core business is within software development and services, meaning although they are not all competitors they need the same type of human resources and financial resources for survival. Most of the firms, due to the nature of the industry, also export products and services internationally.

3.4   Data gathering

It is the nature of the purpose that determines which data collection method to use, and data can be obtained through either a primary- or a secondary source (Merriam, 2002). While primary data is considered to be collected originally by the researcher for the purpose of a specific study, *secondary data* is originally collected for another purpose than that of the study in question (Lundahl & Skärvad, 1999). Patel and Davidsson (1991) further clarify the distinction between the two by stating that secondary data is *second-hand report* while one can consider primary data as a *first-hand report*.

Often, primary data is collected backed up by secondary data in order to increase the data's validity (Merriam, 2002). Also in the present study, both primary and secondary data have been obtained. The primary data aspect was carried out through interviews with key persons within the Sri Lankan software industry, such as CEO's of firms within the industry and governmental software promotional bodies, as well as the 'main' quantitative side, the questionnaire, of the present study. The secondary data has been collected through various sources available to the authors, such as reports by and about the industry.

Much literature in the research field of strategy and entrepreneurial orientation has been collected from various full-text databases, and from Jönköping University Library. Also, other reports and publications on the Sri Lankan IT-, and software market, have been gathered directly from organisations, including SEA, SIDA, SLICTA, and ICTA.

Furthermore, there are different approaches to conducting surveys. Lekwall and Wahlbin (1993) mention three alternatives for such a quantitative study, namely: mail survey, telephone interviews and personal interviews. Personal interviews were limited due to time limitations and a sample of 73 firms. Telephone interviews were seen as an acceptable method, but again time and man power limitations set out barriers. Thus the authors were left with mail surveys as the methodological focus. At present, technological advancements have made it possible to send mail surveys over the internet, in so called internet surveys. As the sample consisted of software firms, which by nature were thought to be dependent on the internet, this seemed like a viable option.

However, mail surveys are characterized by some downsides. For example, there is no insurance of answer, and the result is often lower response rates than other methods. No guarantee can be made either, that the intended person will answer the survey and therefore give the answers a lack of reliability. Internet surveys bring some advantages as well though. It is easy and fast for the respondents to answer, which may increase the likeliness of answers. Also, the process of transferring the data to Statistical Package for the Social Sciences (SPSS) is made easier as the material is already digitalized.

No suitable scripts or programs were available on the internet (that allowed for matrix, and opposite questions), so the authors build an original one in php, communicating with a MySQL server on a website owned by one of the authors.

3.4.1   Design of the quantitative study – Survey design

'Data are only as good as the instrument you used to collect them and the research framework that guided their collection' (Pallant, 2001, p. 3). This calls for applying great carefulness when choosing tools for gathering data.

When constructing the survey, the author's intent was to use measurement scales which had been used in previous research. This would prove their validity and, in general terms, is a better approach than developing new original instruments (Wiklund, 1998). Having been used before, they also ease comparison between different studies in the same area.

According to the research model (Figure 2-3); there are different parts of the study that needed to be included in the survey. For the first part of theory, the resources and capabilities, the authors chose to apply Chandler and Hanks (1994) framework for resource availability. This framework can be used so respondents rate their availability of resources compared to other actors within an industry. The tool takes into consideration the most important resources highlighted in the Resource Based View theory (in terms of knowledge-based and technical-based resources). Addition of the networks as an important resource has been made, and one customer service question together with one marketing question has been excluded due to repetition. In the survey, this part was included in the end, after Entrepreneurial Orientation (EO), because it was believed that answering to the resource availability prior to answering about EO would potentially intervene with these answers.

EO is the other major part of our study, and it deals with both strategy and behaviour. Due to limitations of space and sample size, strategy is seen as either having an EO or parts of an EO (risk taking, innovativeness, proactiveness, autonomy), or not having an EO at all. Otherwise the authors are aware that more detail could have been derived in terms of strategy by including other aspects as well. For an EO, the authors chose to apply a framework for testing innovativeness, risk taking, proactiveness and autonomy. Competitive aggressiveness was excluded because of space limitation. For the EO framework, the questions were taken from Covin and Slevin (1989). This framework built on that of Millers (1983) entrepreneurial posture, but has further been developed. Questions of autonomy were developed by Brown, Davidsson, and Wiklund (2001).

As the environment and its hostility is seen as an important contributor to both how access to resources and EO is perceived, the authors decided to include a small framework for identifying the perceived market hostility and dynamism. These questions were derived from the environmental hostility scale, developed by Covin and Slevin (1989).

In order to provide a base for statistically correct analysis, the different measures used have to be defined in terms of variables. Growth was decided to be used as the dependent variable, because of its nature to measure the outcome of a situation (no matter if it is increased product launches, revenue growth, employee growth, and etcetera). Further, the average increase in sales and employment per year was chosen to represent growth. This is a measure that has been used previously (e.g. Wiklund, 1998), and thus has proven to be relevant. Further explaining the growth measures, logic suggests that a growth process is likely to occur as an increase in demand, which in turn increases sales firstly, allowing for acquisition of further resources. Therefore, Hoy, McDougall and Dsouza (1992) concluded that sales (or revenue) growth is the best considered growth measure in the world of academics (cited in Wiklund, 1998). Another common growth measure is employee growth; however, this measure has to be considered in the light of that employees might be replaced through investments in a process of rationalisation. Despite awareness of the downside, employee growth is also often used as a growth measure in the research field of business administration.

Other growth measures could have been used, such as revenue growth. However, given the nature of business climate in Sri Lanka (in which it seems almost impossible to get the firms to reveal its revenue figures according to Mr. Perera (personal communication, 2006-04-04)), this was left out. However, due to the recommendations and upsides of sales and employee growth, it was chosen to represent growth.

According to Wiklund (1998) it is argued that growth is a more 'accurate and easily accessible performance indicator' (p. 71), than other performance measures such as accounting measures, financial performance, R&D performance, etcetera. However, an alternative view is the one of a multidimensional performance measure which also has been used commonly in previous studies (e.g. Dess & Lumpkin, 1996). However, given the accuracy and easily accessible performance indicator of the growth variables chosen, and the space limitations, and the timeframe of developing a multidimensional performance variable, the only performance indicators chosen are the ones of sales and employees.

The independent variables that make the research model include the different parts of the RBV and EO. For the RBV, these include market expertise, customer service expertise, managerial expertise, financial resources, network (social & business) and technical knowledge. For EO, they include innovativeness, proactiveness, risk taking and autonomy.

3.4.2   **Design of the qualitative study – Interview design**

As stated above, personal interviews with all the firms represented in the sample was considered to be too time-consuming and costly. Furthermore, the choice of how to collect data is determined by the purpose and the research questions, thus, a quantitative approach suits the study best since the purpose of the present study is best answered and measured through a quantitative study. Therefore the quantitative method, as mentioned before, shall be considered as the major mean for reaching the goal of answering the purpose. However, given the downsides of a mail survey, the authors decided to take upon a smaller qualitative approach as well. Personal interviews were considered to be suitable source of data in order to gain a background on the industry and a profound understanding of what the firms within the industry face. As stated above, the qualitative research of the present study was conducted in the format of personal interviews with key persons within, and surrounding, the industry. ICTA, SLASI, SEA, University of Colombo School of Computing (UCSC), as well as CEO's within the industry were approached and interviewed (please see appendix 5, for a brief presentation of these persons, companies and organisations).

Interviewing a respondent in a face-to-face situation has several advantages. Profound understanding can be reached since the form is based on conversations. Also, other elements of the interaction can be observed, for instance, the body language and the facial expressions might facilitate a correct understanding of the interviewee (Saunders *et al*, 2003).

There are several interview approaches, such as structured interview, semi-structured interview, etc. The authors decided to use an unstructured interviewing technique, since it enables the interviewee to treat a certain subject or area of interest in his/hers own pace and realm. The interviewer, on the other hand, participates as an active listener and only poses the necessary questions (see interview guide in appendix 8) for minimal interruption (Patton, 2002). By using an unstructured technique, the authors believe that important and deep industry and firm data can be obtained, in order to deeper understand the industry and its firms, hence providing the ability to explain the results provided from the qualitative data, with examples from a more qualitative perspective.

Furthermore, qualitative study was conducted in accordance to the given guidelines discussed above. The interviews lasted between 30 minutes to one hour, during which notes by both of the authors of this study where taken. It shall further be stated that the presentation of the empirical findings (chapter 4) of the qualitative study is presented in a categorical manner. Also, in order to gain a more readable text to ease for the reader, references on these findings is presented in appendix 4, and not throughout the text.

3.5   **Statistical methods**

The authors believe it is important to mention a little about the procedure of analysing the statistical data collected. The total sample consisted of 73 firms, where 41 replied to the survey. As the total population is estimated to be somewhere around 100, this would mean that41% of the total population has been covered. In these cases, where such a large part of the population is covered, it is not of great necessity to use statistical tools relying on normal distribution. Also because of the fact that the total population is relatively small, it is normal to approach the data in a more qualitative statistical approach (Thomas Holgersson, personal communication, 2006-05-16). Looking at R-values of correlations, instead of relying fully on the significance is part of this, and a rule of thumb is that values exceeding 0.25 should be taken into consideration (although this relation is quite weak).

When the total percentage of the population is high, qualitative interpretations of statistical data can also include scatter plots as long as the variables are continuous. These have been used parallel to correlation analysis in order to illustrate the relationships.

For grouping variables, factor analysis was used. Variables correlating to each other can be used together as one factor, as long as the Cronbach's alpha value exceeds 0.7. Exceptions to this rule can be made, but it is not recommended to do so below the level of 0.5 (Nunnally, 1967).

Regression models should be used as well, to check the dependency of one variable to others. It is also useful for providing evidence of convergent validity for the correlations analysis (Nunnally, 1967). For this thesis, multiple regressions have been used with limited amounts of independent variables (as our sample size is small in comparison to the amount of variables). Because this type of test assumes normal distribution, and a much larger sample and total population, the results from these types of tests should be taken with great carefulness and as a hint of direction rather than concrete results (Pallant, 2001). Also, control variables can be used to further enhance the relationships. For this study, the possible control variables to use were motivation to growth and environmental hostility[4].

Lastly, it should be mentioned that the findings of Knight (1997) might be of interest to the present study. He saw that the relations between EO and growth is weaker if English is not native language in the area of investigation.

3.6   Minor field study issues

This study is a minor field study funded by SIDA. Therefore, the authors had to attend a course in conducting studies in developing nations. Discussions were held with Dr. Marie Thynell (personal communication, 2006-03-03), who informed of some methodological issues that needs to be taken into consideration.

First of all, the time-frame for data collection should be well considered. As communications are often not so good, it will often take more time than expected to get in contact with people. Also, the willingness to participate in studies can be limited due the fact that institutions in Sweden are not well-known in other parts of the world (M. Thynell, personal communication, 2006-03-03).

Culture is another important aspect, as people can perhaps not be approached in the same manner. To resolve these problems, solutions as using contacts to get to the people one is interested in interviewing or surveying is recommended (M. Thynell, personal communication, 2006-03-03). This was also something that was done thanks to already established contacts with the Swedish Embassy and other key persons in Sri Lanka.

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[4] During the statistical testing, both motivation to growth and environmental hostility were tested as control variables, but they showed no significant change in results from regular regressions or correlations. Further, motivation to growth did not show any relation to growth, thus it was later excluded from further analysis.

4 Empirical findings

In this chapter the authors will present the empirical evidence of this study. The empirical findings consist of information gathered from both primary and secondary sources. Firstly, secondary sources will be reviewed followed by the result of qualitative and quantitative primary data.

4.1 Secondary data

Several governmental and private bodies have investigated and published reports on the software industry development in Sri Lanka, in terms of hinder (lack of resources) for development, and strategies to overcome these in order to be able to achieve the by SEA set goal of being a first league software exporter in 2012, and reaching an aggregated export revenue of one billion dollar in the very same year. In comparison with today, the objective of export revenue set is about ten times as much as the current level of industry revenue (Patterson, 2006; SLICTA, 2005). The secondary information reviewed is presented as an introduction to the qualitative and quantitative primary data that is presented further down. While the secondary data mostly concerns information on an aggregated level, the primary data collected is more on a firm-level basis, wherefore the first section presented rather shall be seen as a background and introduction to the primary data collected, than the actual focus of the study itself.

As described in the background, the software industry of Sri Lanka is still in the nascent phase, however a promising one. It is an industry in which the majority of firms only have existed between 2-5 years. Recently a META group report predicts that the outsourcing only from the US will grow at a rate of 20 per cent annually at least until 2008 (cited in SLICTA, 2005). Since one of the major sources of revenue (17 per cent) within the Sri Lankan software industry is represented by business process outsourcing, the outlook for Sri Lanka in this perspective looks bright (cited in SLICTA, 2005). However, even though the road ahead holds opportunities there are obstacles as well.

As stated above, several reports have tried to determine what impediments there are in terms of resources experienced by the firms within the Sri Lankan software industry. The studies have also looked resource strengths carried by the industry.

In the review of the various reports published by, and about, the industry, several resources are highlighted as scarce and constraining to development. The supply of human capital (experienced, and well educated workforce), the lack of essential soft skills are deficient in new recruits, and the lack of capital seems to be major resource constrains, while the major resources working in favour of the industry concerns the low cost labour (if compared internationally) and flexibility (SLICTA, 2005; Patterson, 2006).

Regarding the lack of supply of graduates, the Sri Lankan Information Communication and Technology Association (SLICTA) in a recent survey identified strengths in quality of the graduates supplied, but also major threats (SLICTA, 2005). The employers cited technical strengths in newly graduates, such as various programming languages, and system analysability, while minor deficiencies identified included technical aspects, for instance, system design. The major deficiencies cited, though, were interpersonal skills, creative thinking, proficiency in English, and communication and presentation skills. Furthermore, while specific technical skills are important for Sri Lankan software firms, the skills ranked as most important by the employers include rather theoretical knowledge and non-IT soft skills such as the major deficiencies cited above (SLICTA, 2005; Patterson, 2006). The

obstacle of human resources is further highlighted by Patterson (2006) determining that 'significantly more attention must be paid to training in the soft skills, particularly conversational English and socialization skills'(p. 39).

It is further notable in regards to the lack of supply of human capital, the extremely low number of PhDs in the software industry in Sri Lanka (and in the ICT sector in general). A recent survey discovered only 15 PhDs within the whole ICT industry, employing about 26 000 (SLICTA, 2005). The need for PhDs and other university degrees and high school diplomas is further stressed by Patterson (2006), arguing that not every worker within the industry needs a degree, but many do.

However, even though the quality of graduates is questioned by SLICTA (2006) as the supply increases, the augment of graduates should generally be considered as positive (SLICTA, 2006; Patterson, 2006).

Furthermore, Patterson (2006) stated that together with the scarcities of the above mentioned skills, the scarcest resource today is experienced people. Also, in *Geared for Growth,* SLICTA (2005) addresses the issue but determines a rapid increase of experienced people as time passes by and the Sri Lankan software industry moves forward, lessening the importance of the obstacle.

Since the software industry and its development heavily rely on human resources, the skills and education of the work-force, all this has to be seen as crucial. The workforce seems to have the technical qualities, but lacks of experience and other soft skills.

Moreover, Patterson (2006) further identified that software related services has largely been commoditized, leading those ones involved to mainly compete with price, pushing the margins down. However, developing software product offers opportunities for differentiation resulting in greater opportunities for increasing the margins. According to Patterson (2006), this is recognized by the Sri Lankan firms but since the businesses are dependent on the cash-flow, low margin activities needs to be undertaken since software products usually has longer sales cycles.

The access to capital therefore comes into play, and Patterson (2006) cited the lack of venture capital as crucial for further development of the industry. While the firms seem to view financing as essential to establish and grow product based businesses, local venture capital is almost invisible. Patterson (2006) further on states that 'for the industry to pursue an aggressive product development strategy [as needed if higher margins is to be reached], it will need substantially improved access to capital over what is currently available' (p. 12) highlighting the scarce but important resource of capital further.

Finally, it seems like there are some problems in the very foundation of the business society that acts like a impediment creating an competitive disadvantage to the Sri Lankan firms; the infrastructure. The costs of telecommunication and electricity are substantially higher in Sri Lanka than in those countries of the primary competition (such as India and Europe). Also the bandwidth available is significantly more expensive and limited to many smaller firms (Patterson, 2006; World Bank & Asian Development Bank, 2005). It is suggested that further deregulation and support of the government would improve the situation (Patterson, 2006).

A good infrastructure together with political stability, security, etc. are, if not pre-requisites, of great importance to overseas customers, leaving areas of improvements on a macro level (SLICTA, 2005).

4.2   Primary data

Below follows a presentation of the qualitative and quantitative data gathered by the authors. First the interviews are presented, as they provide a discussion of some firms on the Sri Lankan software industry, followed by the quantitative data which has been processed using SPSS.

4.2.1   Interviews

Because of its secondary importance to the study, the interview data is compromised under the headings 'Resources and capabilities' and 'EO and Strategy'. The most important information presented by our interviewees is stated in text discussing the different issues that were followed from the open discussions around the interview guide (appendix 8). A brief presentation of our interviewees, their firms/organisations and when they were interviewed can be found in appendix 5.

4.2.1.1   Resources and capabilities

With strong growth of the software industry for the last years, the authors wanted to discuss why the firms had chosen to establish in Sri Lanka. Three of the firms interviewed were owned by foreign owners, and their reasons for establishment were primarily price (Teamwork Technology, Ocean Software & Open World Lanka), however, relations with the country have also played a role in the decision. For the Sri Lankan owned firms, establishment is naturally a decision of home nation and local knowledge.

When discussing what they see as the competitive advantage of being in Sri Lanka, their answers differ a little. Although price is mentioned by all, other proposals include the high quality orientation and technical level of the software engineers (Mr. Sekaram); the strategic location of the island (Mr. Casieshitty); and the trustworthiness of Sri Lankan people (Prof. Samaranayke).

Mr. Sekaram gives a brief comparison of Sri Lanka and India, stressing how they differ in terms of access to top-of-the-line staff, while India's top employers consisting of large international firms such as Microsoft, IBM, Oracle and Sun attract the best and brightest students, a few medium sized firms attract the second-best students, while the worst ones get into small businesses. In Sri Lanka there are no large multinational corporations (MNC's) conforming a threat on the access to the best students, so it is possible for any firm offering the right benefits to get their hands on talented people.

Using the advantages of being in Sri Lanka to create uniqueness is very firm specific, and is done in various ways. Eurocenter has developed a system called Spider for organisation, management, error control and customer support as the web of their organisation. All projects are handled through this unique program, allowing Eurocenter to provide extremely processes oriented and structured approaches to outsourcing projects. Mr. Sekaram states that, with their price and quality, it is impossible for firms in the west to provide equal services as time and budgets just don not allow them to do the work as structured and error free. Equally, Dr. Marik of Teamwork Technology stresses that their advantage against competitors is their unique communications management, where workers in Sri Lanka are actively, in real time, working directly on the servers of their overseas customers. With this system being developed, their customers will have direct supervision of the work that is being done, and the workers can work with people from the customer firms without being present in person. Open World Lanka has made use of different open

source solutions, allowing for them to reduce both their and their customers costs greatly. Their employees have developed very specific skills within certain areas (flash, php, MySQL), allowing them to be the leaders in their segment. They have also developed their own open source platform, contributing with their competence to the open source world. Mr. Suraweera of Ocean Software admits that their best competitive advantage is their price, and being the only business intelligence software firm in Sri Lanka, they can attract the most competent people with this type of knowledge. WSO2 differ slightly from the others in terms of what creates their competitive force, as they have extremely well experienced people within the open source development sector, they work constantly to maintain and develop the latest solutions. For them, competitive advantage can only by created for short periods of time and their products have to be constantly developed in order to attract customers. At the Concept Nursery, small firms are raised from creative ideas, such as zMessanger (software for sms-based research), and are allowed to be developed into small niche firms. Mr. Azmeer says that innovation is these students best feature, and they have more chances to realize it now than students had many years ago.

Prof. Samaranayke, Dr. Marik and Mr. Sekaram all talk of the importance for the firms within this industry to find their 'niche'. 'Looking at the firms that have succeeded here, and are outstanding firms such as Millennium and Rapier, they have found a very narrow business segment where they can thrive and be the best', says Prof. Samaranayke. Among the firms interviewed, Open World Lanka is working with the most outlined niche, targeting luxury hotel chains around the world. 'This was a market group in need of innovative web solutions, and we managed to identify this need first, making us the first choice for these hotels and networks', Mr. Casiechitty states. Mr. Sekaram says that they are currently working on narrowing down their customer groups and trying to find a market where they can become the best company for outsourcing. Teamwork Technology and Ocean Software both provide certain services, but to any company. They both state that their products are not related to a specific industry but can be applied to any firm working with any type of business. Dr. Weerawarana's firm WSO2 are working with very specific programs and technologies, which they themselves develop together with help from the open source communities. Although this is a highly unique product, their market is open for most firms looking to apply their solutions. Together with the ICTA, Dr. Weerawarana and other entrepreneurs are also looking into the open source market as a potential niche for the Sri Lankan software industry at large. This is a coming area, and Dr. Weerawarana believes Sri Lanka could be the best at it.

One of the most severe challenges facing these firms, with the exception of Open World Lanka, is finding customers. Ocean Software and Teamwork Technology have sales and marketing offices in the UK and Sweden respectively, Open World Lanka operate their marketing from New York, London, Singapore and soon Shanghai. These sales and marketing offices operate in deep corporation with the firms on Sri Lanka, and provide the basis for new customers. Eurocenter, WSO2 and the firms at the Concept Nursery have a much harder time finding customers. Although Eurocenter has a profile of what their potential customer may look like, approaching them is not easy and quite expensive. As they have decided on customers in Europe, presently with focus on Norway, the distance and travelling allows for costs and hinders in communication. The firms at the Concept Nursery face the same challenges as any recently started firm, namely finding the first customers. Mr. Azmeer explains that they start with approaching Sri Lankan firms, and later move on from there. However, finding the first customers is always difficult with new, untested product and a un-heard-off name. WSO2, operating in the quite different open

source industry, has a challenge of reaching out and convincing their customers that their solution is the best available and that their expertise will be the choice.

It is agreed by all, expect for Ocean Software (who does not currently recruit recent graduates), that students and technical staff in general are very talented but lack certain important traits. Communication skills and management thinking is one of those skills, and Dr. Marik describes how troublesome it is not being able to put a technical guy in front of a customer because of their lacking interpersonal and sales skills.. Therefore, staff with that type of additional experience are sought after and paid higher wages as they can operate both with the technical work and towards the customers. Eurocenter copes with this problem by sending its staff to courses arranged by the British Council, improving especially communication skills. Equally, both Teamwork Technology and Open World Lanka offer different training programs for their employees to gain necessary competence. Ocean Software also has a quite interesting approach to customer service, where they allow newly employed staff to work mainly with local, Sri Lankan, customers to gain understanding and feeling for customer service. Mr. Chaminda explains this as the perfect training-ground for staff to learn essential skills before they move on to serve international customers expecting much higher levels of competence in the customer relations area.

When it comes to resources critical for their success and survival, of course the employees come up as the number one priority. However, on a more general basis, Dr. Marik points out that the technological and infrastructural constrains brought about in Sri Lanka is troublesome for the firm. 'Three years ago, a fishing boat cut of the outgoing fibre-optic cable (SE-ME-WE), providing access to the internet via India, resulting in a stand still in the software industry for a few days and there was nothing to do about it', he mentions as an example of how fragile the infrastructure is. Further, all agree that the price of connectivity is ridiculously high, lying far above the price level of many developed nations.

4.2.1.2   Entrepreneurial orientation and strategy

From the side of Colombo University, ICTA and the SEA it seems quite clear that growth for the software industry at large is to be expected and also wanted. Mr. Azmeer explains that the goal is clearly stated, USD $1 billion in exports by 2012. How the firms, individually, look at growth is however a more interesting side, as they are the ones that have to bring about this increase in exports and sales. Teamwork Technology and Eurocenter have clearly set targets on growth, expecting to increase sales with about 25% per year for the coming years, although Mr. Sekaram states that they measure growth primarily based on how many customers they have. 'Last year our customer base increased with over 100%, although our sales only increased with about 25%', he explains the difference in figures when looking at actual growth. He also points out that for the future; there is a wish to increase sales and revenue without having to employ more staff. 'The processes and routines should be well worked in now, allowing us to expand our customer base without having to add additional staff'. For Open World Lanka the situation is a bit different. Currently the demand for their services is higher than the maximum supply they can provide, so their growth is perhaps not unwanted but rather a natural phenomenon caused by a pull effect from the customers. 'For us, growth is not a stated goal, but the demand from our customers forces us to grow' says Mr. Casiechitty in an attempt to explain their position to growth. For Ocean Software the owner in discussions with Mr. Chaminda have decided that the firm should not be larger than 25 employees, as the type of business they run require a tight organisation where communication between all team members is crucial. Mr. Chaminda also described that the simple spreading of information

and the closeness when working together is important for providing good service in their firm, thus making it hard if they would grow too large.

Equally important as having growth ambitions within firms is to have a climate where investment in IT and software services can make its way. Mr. Perera of ICTA, says that actively working with the private sector, to get them to adhere to new technological improvements will not only enhance companies abilities to compete globally, but also increase the local market for software products and services greatly. Similarly, Prof. Samaranayke stresses the importance of getting children and young students familiar with computers in order to create a large IT-educated workforce for the future. Actions need to be taken, not only within the software industry, if there should be a possibility for the software industry to grow. Prof. Samaranayke also adds that gaining a reputation internationally should also be prioritized, as few know the true difference by investing in Sri Lanka as compared to China and India for instance.

The firms that were interviewed for this thesis were all organized a little differently, depending on their size and culture. Although they lean towards being quite flat organisations, they look at hierarchy and manager responsibility in their own unique ways. Open World Lanka was clearly the most open and flat organisation, although employing close to 80 employees. They worked in teams with each team holding a separate skill (such as flash, php etc.). Within the teams creativity and openness ruled, and it was very possible for a 'simple' programmer to come up with new ideas that could be taken up in the entire organisation. Mr. Casiechitty provided several examples where new ideas and innovations within the firm travelled bottom up, including designs, functions and even the open source contribution discussed previously. Eurocenter operates in a project based manner, where staff could be part of up to three simultaneous projects. The project teams were functionally based, each team being able to provide the solution offered by the firm. Teamwork Technology worked similarly, with teams operating directly on the computers of their Swedish customers. A great load of responsibility was however delivered to the project managers, which were strictly recruited and paid well above average salaries. Creativity was however not explicitly encouraged in the firms, with Open World Lanka as the exception. Mr. Sekaram said that for them, the most important thing is to solve customer problems and add value to the customer's products in a very organized way. Thus they left the aspect of creativity to the customers, and it was not a part of the structured work conducted at Eurocenter. For Teamwork Technology, creativity was encouraged as part of the web solutions they provide, especially when it comes to design features. Mr. Casiechitty of Open World Lanka agreed on this by saying that innovation in design is what makes them special and creativity is important because they want to show off and exceed their customer's expectations'.

Keeping updated on the latest developments and solutions was however something that all felt was important. Even the ICTA, with Mr. Perera, talked about how well Sri Lanka was following the latest developments in the software industry, and working on finding niches, such as open source, where the country could be market leaders. On a firm level though, adoption of technology was more important than development of technology. When asked how they looked at innovation, Mr. Chaminda explained that they constantly monitor and adopt the latest software available, even if it is beta versions, but they are too small to engage in developing our their own technologies. So what could be said is that the firms looked upon innovation in two ways, both as the tools they use in everyday work and as the technologies produced by the firms themselves. Eurocenter for example, had developed and is still constantly improving their own project monitoring and management

software, the Spider. Likewise, innovation for Teamwork Technology was the skills and technology of communication over the internet that they had developed to serve their customers better. Still, only for Open World Lanka, was innovation the means of competing. As mentioned above, Mr. Casiechitty stressed the importance of offering the most innovative services in order to hold their current market position.

Relating to innovation and R&D, two of the interviewees, Dr. Marik and Mr. Chaminda held the opinion that these processes were far too expensive to be carried out by the firms on the Sri Lankan software industry. They stated that there was a reason to why most technology was developed in the west, and that reason was capital. New technology and R&D is costly, making it hard for Sri Lankan firms to lead the way in these areas.

In regards to risk-taking, and the incline for taking financial risks there is a general agreement on the fact that operating software related firm on Sri Lanka, with a majority of income coming from exports, is risky business. Mr. Sekaram says 'everything depends on if we can attract the customers or not, and we have to deliver what we promise or more…else wise, they will just terminate the contract and we will be struggling again'. Coping with risk is not easy though, and having foreign owners (as in the case of Teamwork Technology, Ocean Software and Open World Lanka) is somewhat of a relief although no insurance. Dr. Weerawarana says that their business is probably in the highest risk area of the software industry as their products are free and they need to constantly deliver the absolute top performing software to gain the trust of customers. Also, with a lack of financial resources, the risk of burning all the cash has to be managed well. Dr. Weerawarana, who travels regularly to the US to meet with venture capitalists says that now is a critical time not only for them but also many other software firms. 'Investors are not keen to invest where political instability is high and there is a risk of war' he says. Although having been successful so far, there is no guarantee to get future funding unless they manage to meet the goals they have set today.

Finally, Mr. Chaminda says that 'as long as we have the cost advantage, we at least have a little risk reduction in comparison to competitors from western nations'. Mr. Sekaram mentions that they work on avoiding as much risk as possible, and the investments are not conducted to jeopardize the company but rather to minimize risk (by for example investing in travelling and attending fairs in Sweden and Norway to gain customers).

4.2.2   Survey results

Moving on from the qualitative data towards the quantitative, in this section, the authors will report the findings from the survey, after computations using the statistics program SPSS. Several different tests are conducted, including both simple descriptions as well as attempts to explore the relationships proposed in the theoretical framework. Beginning with an overview of the situation in the software industry, and basic information on how the firms within the industry look upon EO and access to resources, the findings are later moved into more advanced statistics in which possible relationships are examined. Allowing for the reader to easily understand and follow the statistical data, a brief explanation of the data is presented prior to each table. To further ease for the reader, a question guide/code index is presented in appendix 2. Note, however, that the data is not analysed and discussed until the next chapter (the analysis).

4.2.2.1   Overview of the software industry

In order to gain a more complete picture of the industry, section 4.2.2.1. concerns an overview of the industry, such as its growth rate, firm size, etcetera. From the total sample of 41 firms, 8 had missing values for growth either because some were founded in 2004 or later (7 firms), thus non-measurable growth, or because refusing to give up their numbers (1 firm). 33 firms could be used to summarize the growth rate (in terms of average employee growth per year) of the sample, and its mean is around 32%. .

	N	Minimum	Maximum	Mean	Std. Deviation
Avg. emp. growth	33	-16,25	145,00	32,2318	36,72170
Valid N (listwise)	33				

Table 1 Average annual growth rate

20 respondents filled in their sales figures, and from these using the average sales growth between 2003 and 2005, no outliers were identified. From the 20 firms responding, the authors found that the average sales growth was around 74 % (see table 2 below).

	N	Minimum	Maximum	Mean	Std. Deviation
Avg. sales growth	20	-2,97	360,94	74,5733	100,87894
Valid N (listwise)	20				

Table 2 Average annual growth rate (sales)

The tables (table 3 and 4) below represent the frequency of different paces of growth (negative, moderate, good, and fast). Moderate growth holds a bit larger portion of the firms, both in terms of the employee measurement and the sales measurement.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Negative-, or no growth	8	19,5	24,2	24,2
	Moderate growth (0-30%)	11	26,8	33,3	57,6
	Good growth (30-60%)	8	19,5	24,2	81,8
	Fast growth (60%+)	6	14,6	18,2	100,0
	Total	33	80,5	100,0	
Missing	System	8	19,5		
Total		41	100,0		

Table 3 Performance of weighted employee growth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Negative-, or no growth	3	7,3	15,0	15,0
	Moderate growth (0-30%)	8	19,5	40,0	55,0
	Good growth (30-60%)	3	7,3	15,0	70,0

	Fast growth (60%+)	6	14,6	30,0	100,0
	Total	20	48,8	100,0	
Missing	System	21	51,2		
Total		41	100,0		

Table 4 Performance of weighted sales growth

According to the EU standard for determining SMEs[5], this is a summary of the sizes of the responding firms. A large portion (56%) is small firms, holding 10 to 49 employees, while other sizes are a bit less represented. Notable is that only 4.9 per cent of the firms are considered as large.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Micro 1-9	5	12,2	12,2	12,2
	Small 10-49	23	56,1	56,1	68,3
	Medium 50-249	11	26,8	26,8	95,1
	Large 250+	2	4,9	4,9	100,0
	Total	41	100,0	100,0	

Table 5 Size of responding firms (EU SME standard)

Moving on to more theoretical concepts, table 6 below identifies the mean values and standard deviation of the sample's different answers to questions relating to innovativeness, risk taking, proactiveness and the environment. As can be seen and further discussed in the analysis, is that the perceived level of EO is quite high and that the environment is not perceived as either hostile, nor inert and stable. See appendix 1 and 2 for the full list of questions on EO.

	N	Minimum	Maximum	Mean	Std. Deviation
Innovation1	41	1	7	5,00	1,732
Innovation2	41	2	7	5,12	1,552
Risk1	41	2	7	4,76	1,496
Risk2	41	1	7	4,02	1,525
Risk3	41	2	7	5,05	1,322
Proactiveness1	41	3	7	5,07	1,149
Proactiveness2	41	2	7	5,12	1,400
Proactiveness3	41	1	7	4,12	1,676
Proactiveness4	41	2	7	5,66	1,371
Autonomy1	40	1	7	3,67	1,492
Autonomy2	41	1	7	3,80	1,520
Autonomy3	41	1	7	4,88	1,584

[5] See 1.4 for the definition on SMEs in accordance to EU.

Autonomy4	41	1	7	4,22	1,796
Environment1	41	1	7	3,88	1,418
Environment2	41	1	7	3,27	1,225
Environment3	41	1	7	4,54	1,325
Valid N (listwise)	40				

Table 6 Mean and standard deviation of EO-components

After conducting a factor analysis to determine that relation between the different variables in the EO model, (guided by statistical theory such as Cronbach's alpha) it was concluded that questions innovation1, innovation2, risk1, proactiveness1, proactiveness2, proactiveness 3 and proactiveness4 were the ones that could best be used to valuate EO[6] (see appendix 6 for data from the factor analysis and reliability analysis of Cronbach's alpha). Autonomy and the perceived environment are to be analysed separately, and the other questions were removed due to their low correlation to the other dimensions, indicating that autonomy does not co-vary with the other variables of EO (see table below).

		Autonomy	Innovation	Risk	Proactiveness
Autonomy	Pearson Correlation	1	,012	-,097	-,089
	Sig. (2-tailed)	.	,943	,551	,583
	N	40	40	40	40
Innovation	Pearson Correlation	,012	1	,456(**)	,677(**)
	Sig. (2-tailed)	,943	.	,003	,000
	N	40	41	41	41
Risk	Pearson Correlation	-,097	,456(**)	1	,307
	Sig. (2-tailed)	,551	,003	.	,051
	N	40	41	41	41
Proactiveness	Pearson Correlation	-,089	,677(**)	,307	1
	Sig. (2-tailed)	,583	,000	,051	.
	N	40	41	41	41

Table 7 Correlations between autonomy and the individual dimensions of E0

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

If the correlation between EO as one construct (on an aggregated level) and autonomy is examined the same result is logically found:

		EO

---

[6] Note that when the EO is measured, it is the aggregated variables of the individual questions constructing EO as explained by the discussion above. However, in the break down of the components of EO, all questions on risk-taking is included and measured, thus overlooking the factor analysis and reliability analysis (the alpha value), in order to explore all possible correlations.

Autonomy	Pearson Correlation	-,058
	Sig. (2-tailed)	,722
	N	40

Table 8 Relationship: autonomy and EO

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

Furthermore, when looking into the EO as accepted, the table below shows some basic descriptive statistical data, indicating a quite high level of EO on a general level within the industry.

	N	Minimum	Maximum	Mean	Std. Deviation
EO	41	16,00	48,00	34,8537	7,36057
Valid N (listwise)	41				

Table 9 Combined EO factor (mean and std. deviation)

Another regular descriptive exploration was conducted for the questions on resources. Although some cases did not report all questions (as can be seen from the N-row), the data from this table will be important in understanding how the firms perceive their access to resources.

	N	Minimum	Maximum	Mean	Std. Deviation
Availability of capital	41	1	7	4,59	1,673
Leading edge equipment and development facilities	41	2	7	5,07	1,634
Marketing expertise	41	2	7	4,76	1,625
Managerial expertise	41	2	7	5,37	1,356
Technical/programming expertise	41	2	7	6,10	1,136
Expertise in product/service development	41	2	7	5,80	1,209
Expertise in customer service	41	3	7	5,59	1,117
Expertise in process technology	40	3	7	5,23	1,349
Highly productive employees	41	3	7	6,02	1,107
Access to resourceful social and business networks	40	3	7	5,28	1,198

Access to low cost labour	41	3	7	5,15	1,333
Access to low cost raw materials	39	1	7	4,00	1,192
Access to low cost distribution channels	41	1	7	4,61	1,376
Flexibility to adapt to new industry and market trends	41	3	7	5,44	1,205
Employees trained to provide superior customer service	41	2	7	5,22	1,458
Employees with innovative, new product/service ideas	41	2	7	5,66	1,371
Employees with creative and new ideas within marketing	41	2	7	5,07	1,523
Valid N (listwise)	0				

Table 10 Mean and standard deviation of access to resources components

4.2.2.2 Relationships between resources and entrepreneurial orientation

For interpretation of the data, the authors use the R-value, which is represented by the value of 0.226 in the table below. The Sig. (significance level) describes at which level of significance the relationship is present, and the aim is to not have a value above 0.1 (if results should indicate a relationship at the 90%-level). However, as mentioned in the method, the sample covers a large percentage of the total population, and because the significance is based on normal distribution, it should only be used as an arrow of direction and is not a completely reliable value. 0.226 indicates that there is a relationship, but very weak, and only a very small portion of the combined resources can help to explain the existence of EO among the respondents.

		EO	Resources
EO	Pearson Correlation	1	,226
	Sig. (2-tailed)	.	,172
	N	41	38

Table 11 Relationship: EO and resources

In order to break down the resource part, factor analysis was used to identify components of the variable. These were made up of those with a strong correlation between each other, and representing different types of resources. The individual questions was thus put in five sub-constructs, made up of quality resources (*Quality*), technical resources (*Technical*), marketing and customer knowledge resources (*Marketing & customer*), production materials and equipment (*Production input*), and labour and flexibility (*Labourflex*). From this it is

derived that two of the resource groups, *Technical* and *Labourflex*, can be held reliable for the resources explaining EO, with R values of 0.380 and 0.382.

		EO
EO	Pearson Correlation	1
	Sig. (2-tailed)	.
	N	41
Quality	Pearson Correlation	,079
	Sig. (2-tailed)	,623
	N	41
Technical	Pearson Correlation	,382(*)
	Sig. (2-tailed)	,015
	N	40
Marketing & customer	Pearson Correlation	,045
	Sig. (2-tailed)	,781
	N	41
Production input	Pearson Correlation	,016
	Sig. (2-tailed)	,923
	N	39
Labourflex	Pearson Correlation	,380(*)
	Sig. (2-tailed)	,014
	N	41

Table 12 Relationships: EO and breakdown of resources into 5 components

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Breaking *Technical* and *Labourflex* down further, to identify the individual questions or factors having a relation to EO, it can be seen that P3C5 (technical and programming skill), P3C6 (experience in product and service development), P3C14 (flexibility to adapt to new markets and industry trends) and P3C16 (employees with innovative product and service ideas) are those with highest R value.

		EO
EO	Pearson Correlation	1
	Sig. (2-tailed)	.
	N	41
P3C5	Pearson Correlation	,304
	Sig. (2-tailed)	,054
	N	41
P3C6	Pearson Correlation	,348(*)
	Sig. (2-tailed)	,026
	N	41
P3C8	Pearson Correlation	,180
	Sig. (2-tailed)	,268

	N	40
P3C16	Pearson Correlation	,473(**)
	Sig. (2-tailed)	,002
	N	41
P3C11	Pearson Correlation	,196
	Sig. (2-tailed)	,220
	N	41
P3C14	Pearson Correlation	,470(**)
	Sig. (2-tailed)	,002
	N	41

Table 13 Relationships: EO and individual factors of Tech1 and Labourflex

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

To ease the qualitative interpretation of the statistical data, a scatter plot was created   (see below) to illustrate the found relationship between the resources contributing mostly to EO, and EO itself. As can be seen by the correlation data below, the relationship is now much stronger than that of resources in general and EO, and statistical explained by the r-value of .493 in table 14 below.
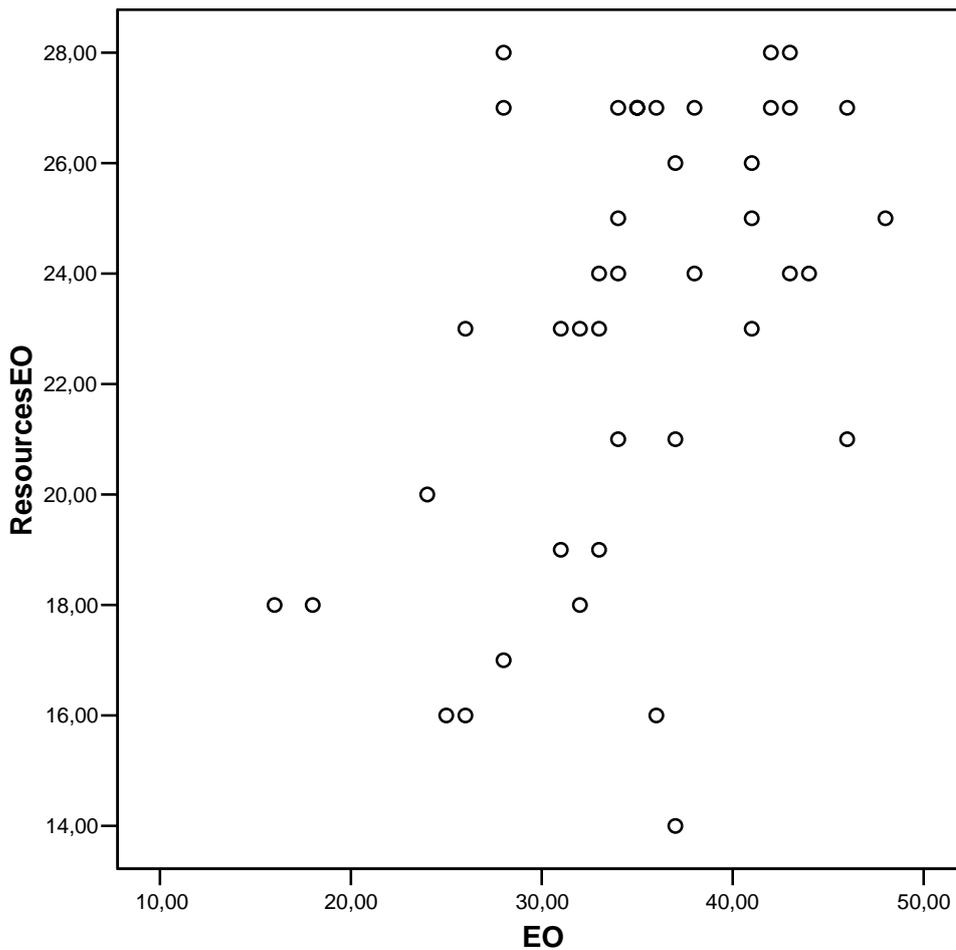
Figure 4-1 The relationship between resources contributing most to EO and EO itself

51

		ResourcesEO
EO	Pearson Correlation	,493(**)
	Sig. (2-tailed)	,001
	N	41

Table 14 Relationship: EO and resources correlated to EO

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

4.2.2.3 Resources and growth

To identify if there was any relation between the dependent variable growth, and a combined variable for all resources, the authors used a scatter plot (figure 4.2) supported by a correlations analysis (table 14). A slight pattern of relation was identified, and an R-value of 0.383 confirmed this (significant at 0.05-level).
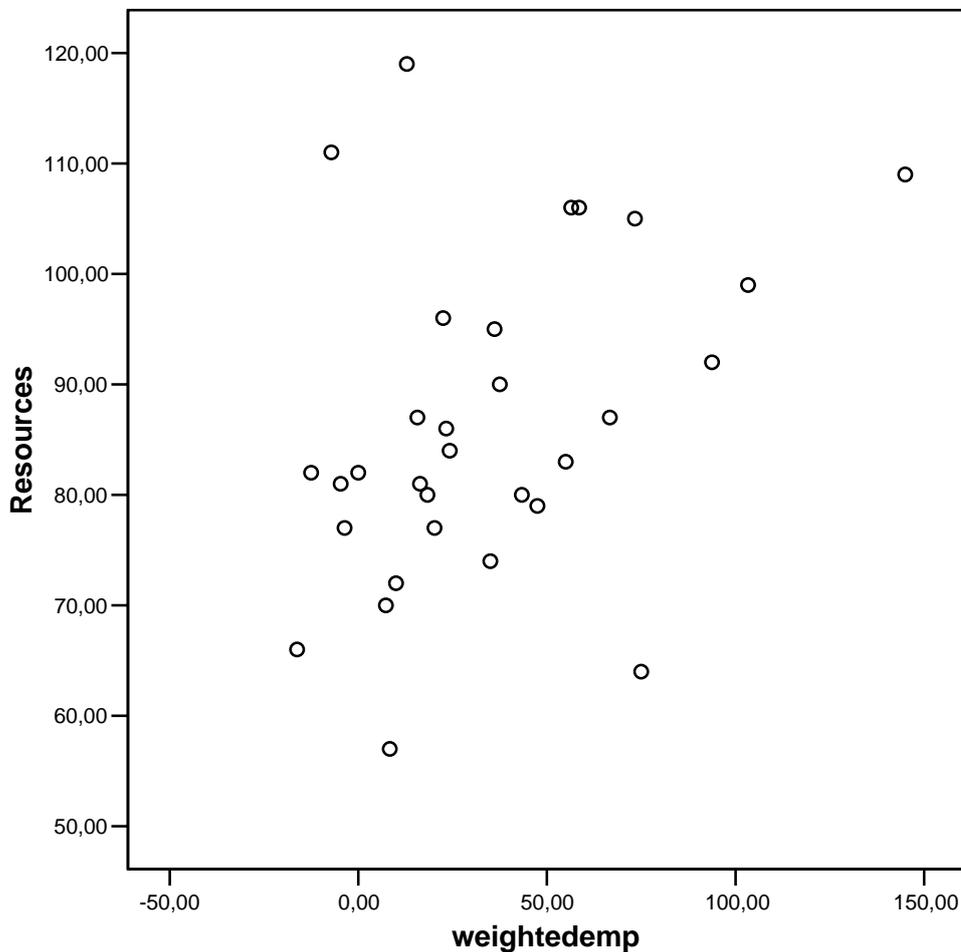
Figure 4-2 Resources and average employee growth

		Resources
Avg. annual growth (emp.)	Pearson Correlation	,383(*)
	Sig. (2-tailed)	,033

N	31

Table 15 Relationship: average annual growth in employees and resources

* Correlation is significant at the 0.05 level (2-tailed).

To further investigate if certain factors contributed more to growth than others, the combined groups of different factors (presented in the section above), was used to break down the 'general' variable of resources. Relations were found between growth and *Quality*, *Technical* and *Marketing & Customer*, with a slight but very weak and not necessarily significant relation with Labourflex. ProductInput showed the worst relation, indicating that those factors have nothing to do with the growth of the sample.

		Quality	Technical	Marketing & Customer	Production Input	Labourflex
Avg. annual growth (emp.)	Pearson Correlation	,320	,345(*)	,308	-,068	,210
	Sig. (2-tailed)	,069	,049	,081	,710	,240
	N	33	33	33	32	33

Table 16 Relationship: Average annual growth (employees) and components of resources

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

To find the individual factors contributing to growth, the groupings showing highest R-values (Quality, Technical and Marketing & Customer) were broken down into individual resources. The results of the correlations analysis show a relationships between growth and marketing resources (P3C3), managerial resources (P3C4), technical and programming expertise (P3C5), expertise in product and service development (P3C6) together with creativity and new ideas within marketing (P3C17). See table below.

		Avg. annual growth (emp.)
P3C2	Pearson Correlation	,230
	Sig. (2-tailed)	,197
	N	33
P3C4	Pearson Correlation	,307
	Sig. (2-tailed)	,083
	N	33
P3C9	Pearson Correlation	,291
	Sig. (2-tailed)	,100
	N	33
P3C5	Pearson Correlation	,359(*)
	Sig. (2-tailed)	,040
	N	33
P3C6	Pearson Correlation	,365(*)
	Sig. (2-tailed)	,037
	N	33
P3C8	Pearson Correlation	,201
	Sig. (2-tailed)	,262
	N	33
P3C16	Pearson Correlation	,247
	Sig. (2-tailed)	,167

	N	33
P3C3	Pearson Correlation	,311
	Sig. (2-tailed)	,078
	N	33
P3C7	Pearson Correlation	,125
	Sig. (2-tailed)	,487
	N	33
P3C15	Pearson Correlation	,192
	Sig. (2-tailed)	,284
	N	33
P3C17	Pearson Correlation	,356(*)
	Sig. (2-tailed)	,042
	N	33

Table 17 Relationship: Average annual growth (employees) and individual factors of Quality1, Tech1 and Mark1

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Combining these identified resources into a new variable, ResourcesGrowth (the resources contributing most to growth), a scatter plot (see figure 4.3 below) was created to see if the relation was stronger than to the first variable of resources. As indicated by the correlations analysis below (table 18), the new R-value was 0.442 or even 0.522 when the slight outlier was removed. These relationships are significant in explaining the resources contributing to growth.
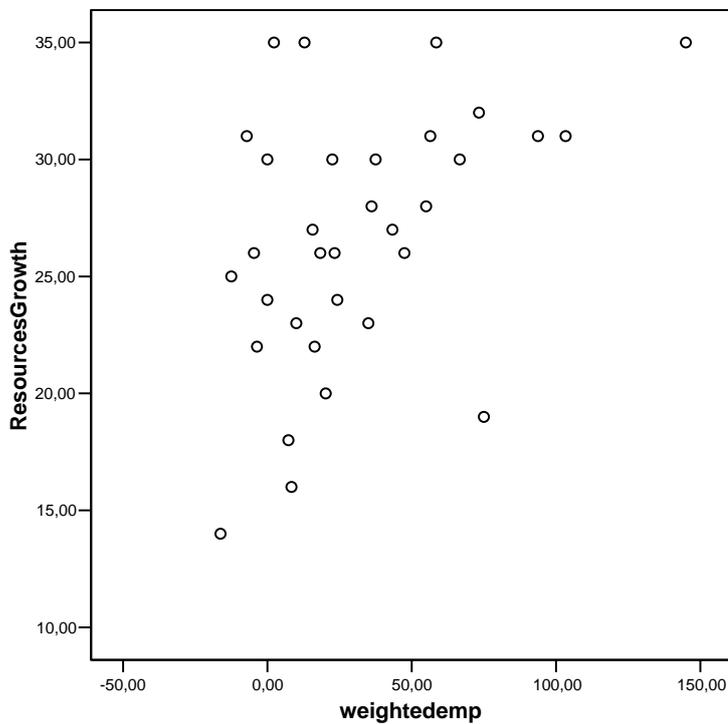

Figure 4-3 ResourcesGrowth and average employee growth

		ResourcesGro wth
Avg. annual growth (emp.)	Pearson Correlation	,442(**)
	Sig. (2-tailed)	,010
	N	33

Table 18 Relationship: Average annual growth (employees) and 'ResourcesGrowth'

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

The authors further explored a breakdown of the groupings, including the Labourflex variable. From this it was derived that also flexibility to adapt to new industry and market trends (P3C14) was important to growth. A new variable including this resource was created in ResourceGrowth2, showing a correlation to growth with .0447 (or 0.519 when a slight outlier was removed).

		ResourcesGro wth2
Avg. annual growth (emp.)	Pearson Correlation	,447(**)
	Sig. (2-tailed)	,009
	N	33

Table 19 Relationship: Average annual growth in employees and 'ResourcesGrowth2'

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

4.2.2.4 Entrepreneurial orientation and growth

As presented above (section 4.2.1), our findings suggest that the combined EO component shall exclude autonomy as a dimension. Therefore, autonomy is measured separately, though included in this section. Furthermore, there seem to be a very weak correlation between EO and growth, if any at all. If measured in terms of weighted employee growth (in per cent), the R-value .115 does not indicate any significant relationship. However, if measured in weighted sales growth (in per cent), a weak still significant relationship can be found (as the R-value of .323 indicates). Autonomy on the other hand seems to have significant relationship with the both growth variables considered (R-values of .314 and .412).

		Avg. annual growth (emp.)	Avg. annual growth (sales)
EO	Pearson Correlation	,115	,323
	Sig. (2-tailed)	,524	,165
	N	33	20
Autonomy	Pearson Correlation	,314	,412
	Sig. (2-tailed)	,081	,079
	N	32	19

Table 20 Relationship: EO and autonomy to average annual growth (employees and sales)

* Correlation is significant at the 0.05 level (2-tailed).

To further break down the information, table 21 below indicates several correlations. The different dimensions of EO show various relationships. While the dimension of innovativeness does not hold any significant relation to the growth variables, proactiveness shows a quite strong correlation to weighted sales growth (R-value of .526). Also, risk shows negative relationship, though weak, to weighted sales growth.

		Autonomy	Innovation	Risk	Proactiveness
Avg. annual growth (emp.)	Pearson Correlation	,314	,165	,155	,087
	Sig. (2-tailed)	,081	,360	,390	,631
	N	32	33	33	33
Avg. annual growth (sales)	Pearson Correlation	,412	,175	-,238	,526(*)
	Sig. (2-tailed)	,079	,460	,311	,017
	N	19	20	20	20

Table 21   Relationship: Average annual growth (employees and sales) and components of EO

* Correlation is significant at the 0.05 level (2-tailed).

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

If further look into the variable of autonomy, it is observable that it is especially for question P2C11, that is to say, a strong correlation between weighted sales growth and the firm emphasise on getting things done even if it means disregarding formal procedures. Also the question on organisational forms and job descriptions shows a relationship with weighted sales growth. Further, the question on organisational forms and control systems (P2C13 and P2C10) shows a very weak significant correlation with weighed employee growth (with R-values of .288 and .278), while job behaviour (P2C12) further is correlated to weighted sales growth.

		P2C10	P2C11	P2C12	P2C13
Avg. annual growth (emp.)	Pearson Correlation	,278	,101	,188	,288
	Sig. (2-tailed)	,124	,575	,296	,104
	N	32	33	33	33
Avg. annual growth (sales)	Pearson Correlation	,173	,488(*)	,330	,342
	Sig. (2-tailed)	,479	,029	,156	,141
	N	19	20	20	20

Table 22 Relationship: Average annual growth (employees and sales) and factors of autonomy

* Correlation is significant at the 0.05 level (2-tailed).

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

Furthermore, if looking into the weak relationship between risk and average sales growth, question P2C3 is the variable contributing most to the negative correlation (with an R-

value of -.324, see table below), while the other variables does not hold any significant relationship. This further strengthen the results of the factor analysis of the EO dimensions, in which the alpha value between the questions were unacceptable low resulting that only P2C3 is the question by which risk-taking is measured

		P2C3	P2C4	P2C5
Avg. annual growth (sales)	Pearson Correlation	-,324	,193	-,070
	Sig. (2-tailed)	,164	,416	,771
	N	20	20	20

Table 23 Relationship: Average annual growth (sales) and factors of risk

* Correlation is significant at the 0.05 level (2-tailed).

To continue, if the variables of EO contributing most to growth (the questions on Autonomy except for P2C10, and those ones on proactiveness), the relationship becomes strong with an R-value of .660 (on the 5 per cent significance level), R-square value of .436, and the adjusted R-square value of .405 (see table 24 below).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,660(a)	,436	,405	77,83449

Table 24 Regression of Growth and EO growth components

Also, the relationship of the most significant variables of EO contributing to sales growth becomes visible through the graphical scatter plot below, which indicates a relationship where weighted sales grows as the variables of autonomy and proactiveness increases.
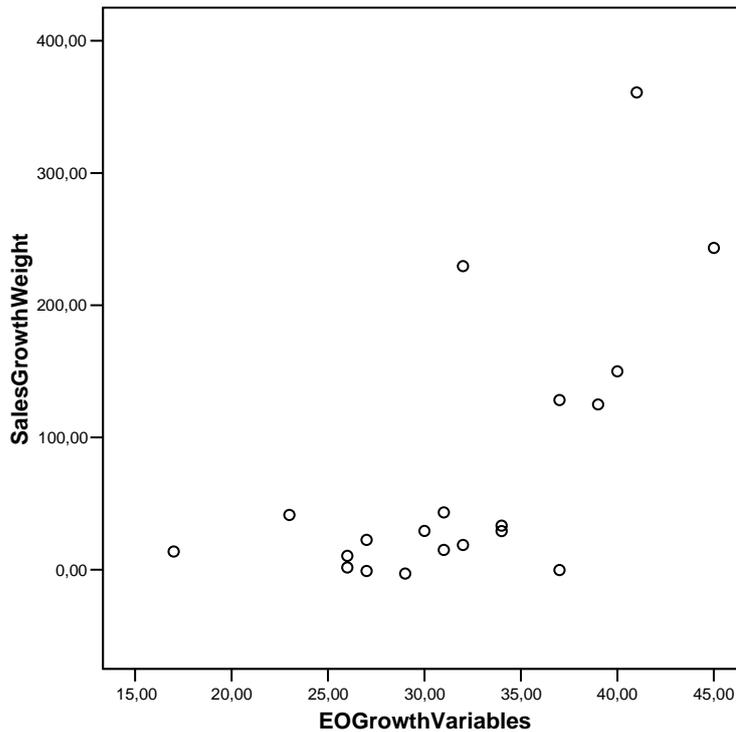
Figure 4-4 Average sales growth and EO growth variables

Having examined the correlation between EO and growth, the relationship between EO and environment is next to be examined.

4.2.2.5 Entrepreneurial orientation and the environment

The exploration of EO and environment starts with looking at the general correlation between EO and the environment, where no relation is found (R-value=-0.056). To clarify and further expand on the possibilities, the different components of EO were used, including autonomy, to compare against the environment. The result is the same for the innovation, risk taking and proactiveness (which make up EO). However, a relationship between the environment and autonomy becomes apparent (R-value=0.349, significant at the 95%-level).

		Autonomy	Innovation	Risk	Proactiveness
Environment	Pearson Correlation	,349(*)	-,089	,018	-,109
	Sig. (2-tailed)	,027	,580	,909	,496
	N	40	41	41	41

Table 25 Relationship: Environment and components of EO

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

The relationship between the environment and autonomy, illustrates that as the environment becomes more hostile, the higher level of autonomy the firms have.

Moreover, to examine if any certain factors making up autonomy were contributing more or less to its relation to the environment, another correlation analysis was conducted. The

new findings indicate that especially P2C13 (vertical/horizontal organisation) had a clear relation to the environment (R-value=0.475, significant at the 99%-level).

		Environment	P2C10	P2C11	P2C12	P2C13
Environment	Pearson Correlation	1	,104	,245	,215	,475(**)
	Sig. (2-tailed)	.	,524	,123	,177	,002
	N	41	40	41	41	41

Table 26 Relationships: Environment and factors of autonomy

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

4.2.2.6 Resources and the environment

Looking at the relationship between resources in general, and the environment, a small and insignificant negative relationship can be identified. This indicates that underlying, there might be factors more prominent in explaining this relationship.

		Resources
Environment	Pearson Correlation	-,259
	Sig. (2-tailed)	,116
	N	38

Table 27 Correlation between environment and resources

In order to get a better understanding of what factors are effected by the environment a break down is taken into consideration. Here, the previously used *quality*, *technical*, *marketing and customer knowledge*, *production input* and *labour flexibility* are looked at. Quality (R-value= -0.414) and marketing and customer knowledge (R-value=-0.315) show the strongest negative links.

		Quality	Technical	Marketing & Customer	Production Input	Labourflex
Environment	Pearson Correlation	-,414(**)	-,244	-,315(*)	,064	-,048
	Sig. (2-tailed)	,007	,129	,045	,699	,765
	N	41	40	41	39	41

Table 28 Correlations between environment and the resource factors

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Breaking these down further, into individual resources, the following showed significant relationships to growth. Leading edge equipment and facilities (P3C2), managerial expertise (P3C4), technical and programming skill (P3C5) together with customer service knowledge (P3C5).

		P3C2	P3C4	P3C5	P3C7
Environment	Pearson Correlation	-,394(*)	-,447(**)	-,322(*)	-,318(*)

	Sig. (2-tailed)	,011	,003	,040	,042
	N	41	41	41	41

Table 29 Correlation between environment and resource questions of the Quality factor

*   Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

In the present chapter statistical data of the correlations of the components of the research model have been presented. Several significant relationships have been discovered, but are yet to be analysed. That is what the next chapter is about.

5   Analysis

In this section, the data collected on the Sri Lankan software industry will be analyzed and interpreted using existing theories and models in regards to the frame of references presented. The outline of this chapter follows the one of the empirical findings in order to ease for the reader. Thus, firstly is an overview of the industry presented, followed the analysis of the relationships found, ending with a discussion and summery of the analysis.

5.1   Overview of the industry

The information presented in the background section and in the secondary data collection indicated that the software industry would be one of high growth rate and rapid development. However growth is measured, employment or sales, the respondents of this study hold an average growth rate of 30% and 72% respectively. Although the relevance of the sales figures can be argued, the figures indicate an industry in rapid growth. As the goal is to reach export sales of $ 1 billion by 2012 (SEA, 2005), an industry wide growth rate in sales of over 33% would be required, annually (counting on 2003 export figures). According to the growth rates presented above, this does not seem unreasonable.

Further, the composition of the industry, with a majority (56%) of firms in our random sample being classified as small (10-49 employees). A reasonably strong positive correlation between age and size indicate that the older the firms, the larger they are. Therefore the youth of the software industry could help to explain the proportion of sizes presented in the sample. Thus, the Sri Lanka case might support the findings by Novak and Grantham (2000), indicating that the global market for new software products and services consists mainly of small innovative firms trying to make a living.

In regards to innovation, the general measure of EO is relatively high within the Sri Lankan software industry (mean 38 and standard deviation of 7.36), indicating that EO is an important part of these firms. However, as will later be explored it remains unknown if EO affects growth in a positive way or if EO is explained by other factors.

However, as suggested by Miller (1983), the environment shows a clear and significant relationship to EO. Thus, the more hostile and dynamic the environment is perceived, the more is firms likely to behave entrepreneurially, hence, holding a higher level of EO. This suspected relationship in the present study was reflected in the *7th proposition*. However, when analysing the sample qualitatively the mean value and standard deviation indicates that the software firms in Sri Lanka do neither perceive the environment as very hostile nor inert (see table 6). Hence, the authors have to reject *7th proposition* that the firms within the industry perceive the environment as hostile.

As mentioned by several reports (US Embassy Report, 2001; World Bank & Asian Development Bank, 2005) there are constrains in the industry in terms of certain resources, especially skilled professional and venture capital. Looking at the results from the survey, the access to resources seems above the mean of the range on all questions, indicating that our fourth proposition, that the perceived access to resources would be generally low, cannot be held true. For example, although some firms show very low access to financial capital, the mean (4.59 of maximum 7), tell a different story for the entire sample.

5.2   Exploring the relationships

Guided by the research model and the beforehand out pointed relationships, it is in this section that the constructs and the interrelationships are analysed. Here, the analysis is mainly based upon the quantitative study, as previously indicated, but the results from the qualitative study will also be discussed and provide examples to further strengthen the relationships investigated.

5.2.1   Entrepreneurial orientation and resources

It is argued in theory (by researchers such as Wiklund & Shepherd, 2002) that the relation between certain resources and EO is strong. This means that some resources are more important to drive innovation, proactiveness, risk taking and autonomy than others. Presented suggestions include high market knowledge, which lead to better understanding and exploration of opportunities (Wiklund & Shepherd, 2002), but also resources such as technical, which help describe how well products and services can be created (Rosenberg, 1994). Exploring the relationship between of EO and resources, there were a few findings which need to be addressed. A general exploration of the two variables and their correlation show no significant relationship (only a very weak one at R-value 0.226). However, when broken down into smaller components (quality, technical, marketing and customer knowledge, production input and labour flexibility), some stronger links to EO are identified.

Technical resources show an R-value of 0.382, indicating an existing correlation to EO that cannot be ignored. Also, labour flexibility, shows an R-value of 0.380 and is up for further scrutiny, as it appears to have a significant relation to EO. As indicated in the empirical findings, this scrutiny shows that the resources showing the largest (and significant) importance appear to be:

1. Technical and programming skill (Technical); R-value=0.304, sig=0.054

2. Experience in product and service development (Technical); R-value=0.348, sig=0.026

3. Flexibility to adapt to new market and industry trends (Labour flexibility); R-value=0.470 , sig=0.002

4. Employees with innovative, new product and service ideas (Technical) (R-value=0.473). sig=0.002

The results indicated here are largely related to the field of technical, yet knowledge-based, skills where a common nominator between the resources appears to be that they are related to the development of products and services. In line with what stated by Rosenberg (1994), this type of technical resources can drive EO within firms, and thus help them to create an advantage. It can also be seen that flexibility to adapt to new market and industry trends show a significant correlation, indicating that skills of proactiveness among employees can be essential in creating an environment of EO.

Combining the variable identified to be correlated to EO, and analysing them against EO shows a stronger relation than that of resources in general (R-value=0.493) giving an explanation to what resources that have an effect to EO. Although these resources do not present an entire explanation to the resources behind EO, it gives an indication to some of what some of the important resources are. The *5th proposition* in the research model states

that there should be a relation between EO and knowledge based resources. All of the above identified as significantly contributing are knowledge based, but all knowledge based are not identified as significantly contributing. So, the *5th proposition,* indicating a relationship between knowledge based resources and growth, is partly true, although some knowledge based resources from the list have to be excluded in order to find a significant relationship.

The interviews provided several examples of resources making contributions to the entrepreneurial aspects of the firms as well. Open World Lanka talked of the importance of technical staff having creativity to develop new products and services in order for them to stay in the lead. Similarly, having EO was extremely important to WSO2, whose survival depended on constant renewal and always staying on step ahead of competitors. This could only be reached by having the right team to create the software, but they also needed to have an idea of where they were heading. Although innovativeness was low in both Teamwork Technology, Eurocenter and Ocean Software, their employee's ability to keep updated on the latest trends was important in guaranteeing customer satisfaction.

Although the qualitative examples above can present no generalizations for the industry at large, they give an indication of which type of characteristics that are important to EO. At the same time, it should be mentioned that the products and services created do not have to be new themselves to provide for a high rank on EO, but rather as mentioned by Teamwork and Ocean Software, they use the latest existing technology and offer their expertise in using this to customers.

For this part it should also be mentioned that the lack of financial resources, or having financial resources, did not contribute to EO in any way as the qualitative data collected indicated. This proves the *6th proposition* to be very inaccurate, as it predicted a relationship between EO and financial resources.

5.2.2   Entrepreneurial orientation and growth

As presented in the theoretical framework, EO refers to the strategic orientation of a firm and describes *how* new entry is undertaken. As one of the major components of the present study, EO will here further be examined, looking at its relation to growth. If vastly looking at the mean value and other statistical measures from the responses, it is observable that the software firms generally perceive themselves as having a relatively high level of EO. Hence, as stated above, indicating that EO plays an important role within the industry.

In the break down of EO, the three original dimensions are considered. The mean value of innovativeness is about 10.1220 (out of 14) with a standard deviation of 2.768, while the mean value of proactiveness is about 20 (out of 28) with a standard deviation of 4.4. The mean value of the dimension of risk on the other hand is the lowest among the EO dimensions (9.8 out of 14, with a standard deviation of 2.33) though indicating that the firms on a general level are slightly more risk takers than risk averse. This also goes for innovativeness and proactiveness as well (even if the standard deviation of proactiveness indicates a greater variance in responses).

Firstly, the empirical findings presented are naturally of great interest, since these findings differs from those in theory. In the original construct of EO, as argued by Dess and Lumpkin (e.g. 1996; 2005) all different components of EO should have a strong relation to each other (proactiveness, innovation, risk taking and autonomy). However, conducting a factor analysis to check for the correlation between the components in this study reveals that the situation is not the same for this group of firms. Some questions of the EO

construct are excluded because of their low correlation to the other EO questions, and the autonomy construct does not seem to have any relation to the EO construct in general. This means that the notion of EO has to be rethought, and autonomy to be analysed separately (yet still as a part of EO).

The only dimension following theory is the one of autonomy. Even if the factor analysis indicates some ambiguity, the inter-dimensional relationships are significant. The R-value for the correlation of innovation and proactiveness is 0.677 (at the .01 significance level), between proactiveness and risk-taking is 0.307, and between innovation and risk-taking is .456 implying an overall quite strong correlation between the EO variables. However, no relationship can be found between the original EO variables and that one added by Dess and Lumpkin (1996); autonomy. Thus, although a firm can have a very high level of autonomy, it does not necessarily hold a high level of the other EO factors, and vice versa. Kanter (1983, cited in Dess & Lumpkin, 1996) argues that layers of bureaucracy and organisational tradition impede entrepreneurship (which led Dess and Lumpkin (1996) to 'create' the dimension of autonomy). Based on the empirical evidence in the present study, this must be rejected, since there does not exists any correlation between autonomy and not only EO on an aggregated level, but also on the factor level. A firm might have a high level of EO, but still a low level of autonomy, and vice versa. Though, the findings strongly supports the correlation between autonomy and growth, thus, the higher level of autonomy, the higher level of growth rate. From the qualitative findings, examples can be given from firms such as Open World Lanka and Ocean Software, stressing the importance of openness and having closeness between staff and managers.

To continue, theory suggests that EO enhances growth in a dynamic environment and can be seen as a strategy to cope with environmental uncertainty (e.g. Dess & Lumpkin, 2005; Eisenhardt & Jeffrey, 2000). This thought was also reflected in the propositions, and it led the authors to suspect such a relationship. However, the empirical findings do not indicate any strong relationship between EO and growth. However, if accepting the downsides with the measure of average sales growth, a weak but significant relationship is found (due to its R-value of 0.323). Also, the obvious correlations between autonomy and the two growth variables highlight the variable as important for growth (no matter if it is considered to be a component of EO or not). In further examinations of the results; the dimension of innovation does not seem to have any significant correlation to growth if treated independently, while the dimension of risk taking shows an interesting (but very weak) negative correlation to average sales growth. Moreover, proactiveness holds a strong relationship to average sales growth. Also, as presented in the empirical findings, if further breaking down the dimensions, it is possible to see a very strong relationship between the components that correlates most to growth. As presented in the empirical findings, if combining three of the autonomy questions and the questions on proactiveness the correlation to sales growth is strong, with an R-value of 0.660 (the R-square value of 0.436, and the adjusted R-square of 0.405).

Moreover, as described, the dimension of proactiveness reflects the firm's eagerness to act on future trends, needs and wants, and to seize new opportunities. And the two methods discussed in the framework include:

1. To introduce new products/technology/services before the competition

2. To continuously seek out new product and service offerings.

In the case of the Sri Lankan software industry, proactiveness, as stated, is strongly correlated to sales growth. Furthermore, it is interesting to note that one method of striving towards proactiveness includes innovativeness (new product/technology/service development), however, although Sri Lankan software firms perceives themselves as proactive, the method of innovation does not seem to contribute to growth on a general level. Thus, the probability that the firms rather continuously seek out for new offerings, hence relying on the second method for growth to a higher extent. This is also found in the qualitative data where Mr. Chaminda states that 'we constantly monitor and adopt the latest software available, even if it is beta versions, but we are too small to engage in developing our own technologies' . The example of 3M provided in the theoretical chapter is a case where innovation has paid off. However, a focus on R&D expenditure can be devastating for a firm as well if the outcome is not positive (see section 2.4.1.1).

Also, the dimension of risk-taking refers to the willingness to move beyond established *tried-and-true* praxis. In the present study, a statistical significant negative relationship between risk-taking and growth can be found. Interestingly, if conducting a correlation analysis, the r-value (0.456) found indicates a quite strong correlation between the EO variables of innovativeness and risk-taking. Given this relationship and the negative influence of risk-taking on growth, the understanding of using the second method to stay proactive becomes clearer.

Analysing this in the light of the discussion above, the Sri Lankan software firms can be seen as tending to be more *takers of change* rather than *leader of change* since innovations are not correlated to growth. This stated, it does not necessarily mean they have to perform poorly. Dess and Lumpkin (2005) argued that firms by being proactive, can be just as successful as the first movers (innovators).

To conclude, on a general EO level, a weak relation to sales growth is demonstrated through the R-value of 0.323. As a result, the *1ˢᵗ proposition* cannot be accepted since there does not seem to exist any *universal* relationship between growth and EO. In such a case, EO would also be correlated to the average employee growth variable. However, in the breakdown of the dimensions it becomes obvious that proactiveness and autonomy shows a quite strong correlation with growth (especially sales growth), even though those dimensions do not co-vary between themselves. Exploiting innovation and opportunities effectively is of great importance to create competitive advantages. However, Sri Lankan software firms seem to create competitive advantages through other means than innovation, since no correlation to growth can be found. Therefore, in this case EO seems to work in favour for growth in terms of proactiveness and autonomy, while risk taking works negatively on growth (although to very low levels).

Finally, the high level of EO might be explained by the nature of the industry, characterised by fierce global competition and rapid change, forcing the firms to generally have a greater level of EO than traditional industries. And even the absence of strong correlation between EO and growth, if breaking down the construct, strong correlations can statistically be found and justified. Stating this, and given the introductory discussion and data, it is logical that the third proposition holds true, namely that the software industry at a general level has high levels of EO (due to the nature of the industry).

5.2.3   Resources and growth

As stated in the theoretical framework, the RBV describes that the right combination of resources and capabilities have the potential to create competitive advantage (e.g. Barney,

1991; Grant, 1991). The chosen strategy describes if and how these resources are utilized to increase the performance of a firm. The empirical findings from the software industry of Sri Lanka suggest that firms perceive their access to certain resources differently. It also suggests that there is a relationship between the resources possessed and growth (R-value=0.383). Although the resources possessed cannot justify for the full explanation to growth, its importance is statistically significant.

In order to see if some resources held greater importance to growth and performance (in terms of employee growth), the general variable for resources was broken down. Although it is argued that a bundle of resources that carry out services is what drives performance (Penrose, 1959), these resources need to be looked at both separately and together in order to identify the ones helping to create a fundament for growth. Although the classic division of firm resources includes financial, human capital, organisational, technological and reputation resources (Barney 1991; Grants 1991), the authors found another more proper division of the resources to suit the respondents of this study (through factor analysis, the correlated variables could be identified). As presented in the empirical part, the identified groupings included quality, technical, marketing and customer knowledge, production input and a group referred to as labour and flexibility. It was found that the quality resources, the marketing and customer knowledge and technical resources had an impact on employee growth (small but still significant). These were further broken down to the individual resource level, where it was found that the specific resources related to growth were:

1. Marketing resources (marketing and customer knowledge); R-value=0.311, sig=0.078

2. Managerial resources (quality resources); R-value=0.307, sig=0.083

3. Technical and programming skill (technical resource); R-value=0.359, sig=0.04

4. Experience in product and service development (technical resource); R-value=0.365, sig=0.037

5. Creativity and new ideas within marketing (marketing and customer knowledge); R=0.356, sig=0.042

As mentioned by McEvil and Chakravarty (2002), knowledge-based skills carry the capacity to create competitive advantage, which could be agreed when looking at the factors identified here. The reason for this is that they are hard, if not impossible to imitate (McEvily and Chakravarty, 2002). Further, knowledge-based determine if a firm can be entrepreneurial or not (Galunic and Eisenhardt, 1994), which could enhance the performance of a firm (McGrath et al. 1996). The empirical part here explains that part of the better performers among firms is related to the above stated resources (R-value=0.442). Looking at the secondary data and the interviews, several reasons to why these resources stand out as important can be found.

High marketing and managerial skills are scarce in the industry, with education focused on technical skill (Patterson, 2006). Further, those firms performing better than others seem to have better access to trained employees in technical and programming skills. This goes in line with some examples mentioned in the interviews, like Open World Lanka whose employees are said to be the best and highest trained within their niche. Further, Teamwork Technology, Eurocenter and Ocean Software all put great emphasis on their recruitment process, offering benefits above average for their employees. It should also be mentioned that these firms have all experienced good to fast growth. With limited supply

of human capital (Patterson, 2006), it could be speculated that the ability to attract the best of the human resources will be a way to increase the knowledge-based resources of the firm and thus according to the quantitative findings, achieve higher growth.

Several of the above stated resources contributing to growth are found in theory as well. Managerial resources has been of known importance to growth for a long time (Pettus, 2001; Barney, 1991; Penrose, 1959) as well as the importance of technological knowledge, which is argued by Wiklund and Shepherd (2002) and Miller (1983) to be a factor important for determining the potential to meet opportunities. Marketing and customer knowledge was also argued to be crucial, but the findings here only allow us to include marketing skill as important for growth (Shane, 2000). Looking at the general statistics of the resources, it is clear that there seems to be no lack of customer knowledge (mean=5.59 of maximum 7), but its relation to growth in not clear. Looking at the secondary data, Patterson (2006), discuss the lack interpersonal, communication and presentation skills might contribute to this low correlation.

Another proposal by Pettus (2001), states that a mangers' perception of the environment determines the way a firm develops its resource base, ultimately deciding on the performance of a firm. The fact that there appears to be a lack of managerial resources (as will be stated further down in 5.2.5 and by Patterson, 2006), and the findings could mean that firms lacking of managerial skill are growing less than firms that have access to managerial experience.

Further it was found that there were no particular relations between other resources, such as financial, equipment or materials. This means that the findings of Cooper et al. (1994), where it was believed that financial resources could potentially be a way to gain competitive advantage cannot be confirmed by the quantitative study, even if the qualitative study and secondary sources (Patterson, 2006) indicate such a belief in the industry.

The *4th proposition* stated that those firms with better access to resources will grow more than other firms within the industry. This is true in regards for the resources that have been identified above, but if looking at the resources as a general factor, no clear relationship to growth (both employee- and sales growth) could be found as significant. The meaning of those results is that those firms that have distinguished themselves in terms of employee growth have actually had greater access to certain resources.

5.2.4   Entrepreneurial orientation and the environment

Theory suggests that the environment poses an element of uncertainty, which have led prominent researchers (e.g. Miller, 1983; Guth & Ginsberg, 1994) to conclude that the higher level of perceived environmental hostility, the more will the firm act entrepreneurially (having a higher level of EO). For instance, the more the environment is characterised by uncertainty, dynamism, and hostility, the more the firms in the market tends to adopt strategic innovation as well as other entrepreneurial activities.

Considering the case of Sri Lanka software industry, as seen in the empirical findings, neither does the EO construct nor do the dimensions of EO separately have any correlation to environment. Though, as also presented autonomy is clearly correlated with the environment, and especially P2C13 (R-value=0.475). Thus, the higher perceived environmental hostility, the higher is the level of autonomy, and especially the more is the communication rather horizontal than vertical.

5.2.5   Resources and the environment

Having stated that Sri Lanka is not a developed nation it would be easy to assume that access to resources would not be the same for a firm operating there than perhaps in a western country, such as Sweden. Although the questions relating to the environment does not directly relate to the overall country characteristics, they foretell information about how the environment is perceived, both in regards to other firms, industry opportunities and the macro forces.

The relationship between resources and the environment did not appear clear until resources were broken down into their groupings. It turned out that the quality resources (R-value=-0.414) and the marketing and customer knowledge (R-value=-0.318) were the factors mostly relating to the environment. However, it should be noted that the relationships were negative, thus indicating a relationship where access to these resource decreases as the environment gains in hostility or is perceived as more hostile.

Breaking the above factors down even further, it was identified that the resources mostly related to the environment were the following:

1. Leading edge equipment and development facilities (Quality); R-value=-0.394, sig=0.011

2. Managerial expertise (Quality); R-value=-0.447, sig=0.004

3. Expertise in customer service (Marketing and customer knowledge); R-value=-0.318, sig=0.042

Looking at technical resources as well, which showed a very weak but still existing relationship to the environment (R-value=-0.244), and breaking it down, it is also found that technical and programming expertise has significant negative relationship to the environment (R-value=-0.322).

Explanations to the negative relationships can be seen by looking the scatter plot of the combined resources contributing to employee growth. The R-value, -0.466, indicates that the environment explains part of the lack of these resources or that the lack of these resources result in the perception of a more hostile environment.

Looking at the secondary data collected, the lack of certain resources, including customer service skills and managerial skills, has been identified by previous studies (such as Patterson, 2006).

5.2.6   Software firms and strategy

It was mentioned by several of the interviewees (Prof. Samaranayke, Mr. Casiechitty and Mr. Sekaram) of the importance for Sri Lankan software firms to find their niche. Although the authors cannot tell from the data gathered whether or not the most successful firms have used niche strategies or not, the RBV states that firms with the right combinations or resources and capabilities have the potential to create strategy that fully utilizes a firms' competitive advantage (Grant, 1991). Thus a basic assumption could be that the strategy of the firms which have grown mostly indeed have utilized their resources well, and also have found those resources that can help drive their businesses.

The interviewees provide a base for a qualitative interpretation of strategy, which could provide some useful examples in understanding how strategy is created around the

resources possessed. Open World Lanka was operating in a very limited market, the luxury hotel industry, providing them with unique and creative solutions to serve their web based needs. Their strategy was simple, to have the most innovative solutions at a reasonable price. The strategy was utilized by setting up a firm in Sri Lanka, providing cutting edge web technology. They also had marketing and sales offices in different places around the world, providing them with the knowledge they needed to utilize success. By attracting open minded and talented people, developed their skills further and finally also gained important market and customer knowledge, their strategy has been converted into action. Like stated by Wiklund and Shepherd (2002), deep market and customer knowledge enables the discovery of opportunity, and the ability to deliver what the customer wants and more. Thus, as in this case, the strategy to combine sales ability with product and service development creativity has resulted in rapid growth during the past years.

Contrary to Open World Lanka, who focused on flexibility and creativity, Eurocenter has focused on structure and standards to utilize their goals of providing the highest quality added value to software programs. Strict guidelines, procedures and a monitoring program ensure the quality of what is being made. However, the most important part, according to Mr. Sekaram, is still the employees which are carefully recruited. Their mission is to add value in such a way that it is impossible to get lousy quality, and to ensure this certain resources are very important. The firm however, is highly dependent on the manager's ability to attract new customers. Thus two components make up the strategy for this firm, namely the skill of the staff and the ability of the manager to sell and market the firm's services. This is in accordance to researchers arguing both the importance of managerial skill and market knowledge (e.g. Pettus, 2001; Wiklund & Shepherd, 2002).

There is also another firm in our interview base, which are in a quite different situation, relating more to that of the dynamic capabilities approach (Eisenhardt & Jeffrey, 2002), than any other. As a part of the open source world, WSO2, have to struggle constantly in order to maintain a competitive product. Strategy cannot be used as a term of planning, but rather just a notion of the fact that constant change is needed.

As can be seen, many different styles of managing strategy can be identified, and this uniqueness is part of the importance in creating firm specific competitive advantage, according to the RBV (Grants, 1991; Barney, 1991). Understanding how the resources at disposal can be used is essential in the creation of performance, and the strategic orientation of the firms in Sri Lanka does not necessarily fit into one of the strategic lenses (Johnson & Scholes, 2002), but rather have an incline to take some from each lens. It is believed that the dynamism first predicted of the software industry cannot be fully interpreted from the results of the environmental questions, but instead the perceptions of the environment is very firm specific and perhaps also reflect the services and products offered. The only clear parallel, which was drawn in a previous section, was that autonomy was related to hostility, meaning that those firms perceiving their environment as hostile had open and flat organisations.

The above mentioned relationship between proactiveness, autonomy and growth show on a more general basis that the lenses concerning change, that is the idea lens and the experience lens, play important parts in creating strategy. The notion that firms cope with their environment by learning, experience and staying open is stretched as important for firms in dynamic markets (Johnson & Scholes, 2002).

5.3   Discussion of the analysis

Having examined and analysed the relationships of interest, the authors feel the need for a more speculative discussion of the analysis where possible explanations to the relationships and their differences and similarities to theory can be addressed. Stating facts and correlations increases the understanding of the current condition of the industry. However, by asking the questions why are the relations like they are and can things be made better in the light of what has been found? No matter if the answer is 'yes' or 'no', it is here the intention to deepen the discussion, and logically try to explain the correlations found.

Starting off with the relations to growth, it was found that certain parts of EO (proactiveness and autonomy) showed significant relations to annual sales growth, while access to certain knowledge based resources contributed to the explanation of employee growth. Although a quite strong relation between employee growth and sales growth could be found (r-value of .444 at the 95 per cent level), the relations between resources, EO and the two growth variables can logically be explained. The knowledge based resources needed to make business are mainly in the form of employees, and thus those that have grown the most are also those that have been able to attract the right set of skills to allow for this expansion (or that they have grown as a result of the emphasis on the knowledge based resources). These firms have managed to see the need for managerial, marketing and customer skills together with the ability to create new products (through technical and product development skills).

On the other hand, sales growth is strongly explained by proactiveness. Those firms who have been able to identify the latest technology and used it too their advantage are the ones that have attracted customers and thus grown the most in sales. In fact, simplifying the information stated, those firms that have grown in terms of employees, have invested heavily on the knowledge based skills named, while the firms that have grown in sales (not excluding that it could be the same firms) have also had an above average proactive approach in terms of developing products and using technologies.

However, it could also be that some firms have managed to stop employee growth but continue sales growth. As one of the interviewees mentioned, their ultimate aim for the next year (read 2007), was to increase sales with 25% without having to add one single employee. This firm worked hard to find customers and understanding their needs. Moreover, the high rate of sales growth might be a reflection of an increasing demand, as Mr. Casiechitty of Open World Lanka states that their demand exceeds the supply. Thus, a very positive sign since the increased demand affect sales firstly, allowing for further acquisitions of various resources. The results of this thesis might give a hint towards which the still to be acquired resources further contribute to growth.

The resources related both to growth and EO help to explain a relationship important to why some firms are more successful than others. Technical and programming skill together with experience in product and service development and new ideas within product and service development provide the link bridging the different variables. These are all resources that deal with 'how' proactive and innovative a firm can be in terms of learning and proactively adopting changes from the environment to create products and services that are in line with the latest advancement on the market. As suspected, the factor of technical resources holds a quite strong relation not only to innovation (r-value=.422), but also to proactiveness, although very weak (r-value=.240).

Based on empirical findings, it seems that innovation comes from other sources than just pure R&D. And even though it seems like the level of innovativeness is high among the Sri Lankan software firms, there is no correlation to explain growth for innovative behaviour as in R&D (as often suggested), but instead the real sales growth contributor concerns innovations in terms of proactive behaviour. Thus, activities strongly related to pure innovation such as emphasis on R&D, is not the major source of innovation, and as observable in the qualitative data, an opinion held by two interviewees is that R&D activities is far to costly for Sri Lankan firms. This might also be reflected by the low level of PhDs in the industry. Since PhDs generally can be associated with R&D, this might be a sign of the scarcity of practices to move, as theory suggest, beyond existing tried-and-true practices to explore the unknown.

R&D activities is also concerned with a quite great level of risk, since the outcome often is unknown (and since the risk is negatively correlated to sales growth (although weak), this seems logical). Since risk-taking affects growth negatively, this strengthens the notion that innovation as a contributor to growth rather comes from proactive behaviour than from pure innovation led activities (R&D, and development of new technologies). Rather, it seems like Sri Lankan firms adapt new technologies and takes the development from there, and that is the way of staying proactive.

However, although innovation does not have any significant impact on growth, it is strongly correlated to proactiveness (r-value= .677), implying that the both methods to reach proactiveness (as suggested by Dess & Lumpkin (2005)) is of importance and does actually contribute to sales growth to some extent. Thus, proactive behaviour is important, and innovation might not be categorised as innovation but proactiveness. It seems like innovative behaviour like R&D (e.g. question P2C3) does not exist in the industry, as previously discussed. However, innovation does take place through proactive behaviour, and innovation in Sri Lanka rather seems to derive from adopting the latest technologies in the firm's development, than invest in R&D to create a new technology. Thus, it is the belief of the authors that the innovations are rather of incremental nature, than revolutionary leading-edge technology development.

Also, the relation between autonomy and growth can then logically be explained. Since innovation does not come from R&D activities, it most probably comes from the regular staff (most likely technical because of its relation to EO) stressing the importance of autonomy. Also, as one might expect if following the reasoning above, autonomy are quite strongly correlated to growth.

To conclude the discussion on EO, as the theoretical example in 2.4.1.5 indicates that, western-, e.g. US-, based technology firms, invest in R & D resulting in a new technology generating a new high-tech product, and introduce it to the market. This example naturally holds the different dimensions of EO involved. The firm takes a risk, initially as a financial commitment to explore the unknown, later a risk of introducing a novel technology (unknown demand), but at the same time, the firm acts proactively as it introduces the technology before those of competition.

However, a Sri Lankan software firm is most likely take another approach. These firms adopt new technology and new applications, and develop their products from there, allowing them to use the latest applications, the strengths of these to provide their customers with a better product. Hence, avoiding the risks involved in R&D, though taking the risk involved in introducing the new application/service (risk of lack in demand) if not developing the product/service after a contract is reached, and at the same time acting

proactively through seizing new opportunities through adapting new software/technology fast and develop their product and services from there. This stated, it does not mean that they develop new technologies, but rather use the latest technologies in development of new programs, web solutions etc.

5.4   Summary of the analysis

Having examined and analysed the various relationships, this section sums up the analysis. Firstly, to illustrate an overview of the analysis, the significant correlations found are presented in the figure below (see next page). Secondly, the relationships will briefly be discussed.
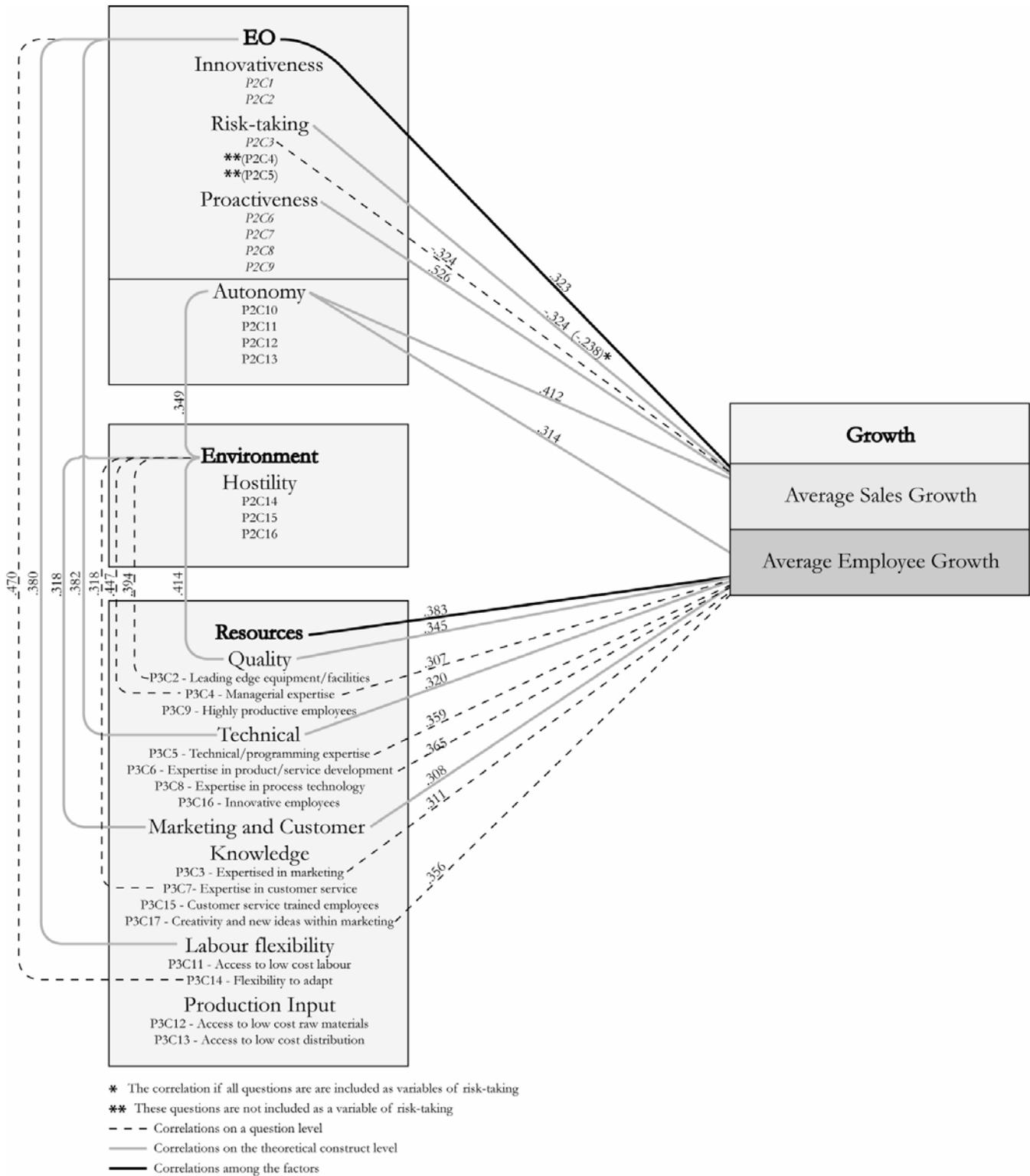

Figure 5-1 Empirical correlations

The above illustrated empirical correlations show that EO and resources are correlated to some extent. Especially the technical resources together with that one concerned with labour flexibility. Hence, certain knowledge-based resources (mostly technical knowledge), is what creates the correlations between EO and resources.

Further, the relations between resources and growth, has shown that a set of important factors have significant impact on employee growth. These include resources from the factors of Quality, Technical and Market and Customer Knowledge, indicating part of the difference between the firms that grow and do not grow (in terms of employees). No relation was found between sales growth and resources, although some components of EO showed quite interesting relations to this. Proactiveness and autonomy clearly had a role in sales growth, where it was speculated that the firms whom were more open, flat and proactive actually had better sales growth. It has to be mentioned though, that these two components do not explain all growth, but their relation shows that they are significant in explaining the phenomenon.

Environment, the third component of our research construct, did not have any relation to growth, so the model was changed to reflect the relationship between the environment, EO and Resources. It was clearer that the access to resources was more affected by the environment than EO, but autonomy had a relation to the hostility of the environment.

In section 2.5 propositions were formulated since one might suspect several relationships based on the discussion held through the frame of references. The table below summarises the propositions and the empirical results found.

Proposition	Result
Proposition 1: EO has a universal positive affect on growth.	No, proposition 1 has to be rejected since only a weak correlation (r-value=.323) was found to average sales growth, while no relation was found between EO and average employee growth.
Proposition 2: The software industry at a general level has high levels of EO (due to the nature of the industry)	Yes, even if it cannot be explicitly said that the industry is the cause of EO, its characteristics are such that they could be meaningful in explaining a high level of EO.
Proposition 3: Most firms will experience a shortage of resources at a general level.	Has to be rejected as the average levels of access to resources seem to be fairly high.
Proposition 4: Firms with high access to resources will grow more (perform better) than the other firms within the industry	Yes, those firms with better access to certain resources (outlined above), have better growth. However, access to resources in general only has a small relation to growth.
Proposition 5: There is a relationship between knowledge based resources and the level of EO.	Yes, those resources contributing to EO consist of knowledge based resources. However, all knowledge based resources do not contribute to EO.

Proposition 6: There is a relationship between financial resources and the level of EO.	No relation what so ever.
Proposition 7: The firms in the Sri Lankan software industry will experience their environment as hostile.	No, the software firms did neither perceive the environment as hostile, nor inert and stable.
Proposition 8: Firms experiencing their industry and markets as dynamic and hostile will have a stronger tendency to use EO.	On an aggregated level no statistical relation was found, thus, proposition 8 has to be rejected.

Table 30 Summery of propositions

6   Conclusion

The purpose of the present study concerns the exploration of relationships between resources, entrepreneurial orientation, the environment and growth. In this chapter the general results corresponding to the research questions are presented with the intention of, answering and fulfilling, the purpose.

It turned out that several relationships were found to be important in the software industry of Sri Lanka. The relations between resources, entrepreneurial orientation, the environment and growth can be summarized as follows:

- Some knowledge based resources (managerial experience, marketing and customer knowledge together with technical and product development skills) were found to be important in explaining growth. Like stated in the RBV, the right combination of knowledge based resources is important in creating competitive advantage.

- Other resources, including technical and product development skill, but also adaptive flexibility and creativity in terms of new product and service ideas had significant importance in explaining the entrepreneurial orientation of firms.

- On an aggregated level, the construct of EO showed a weak, still significant, correlation to sales growth. When innovativeness and risk taking was excluded from the construct of EO, proactiveness and autonomy showed significant and strong relations to the sales levels, indicating the importance of keeping updated, open and flat to meet the demands of the customers.

- The environment was not as hostile as expected, showing no relation to either growth or entrepreneurial orientation (except autonomy), although it appeared to have some meaning in explaining the lack of managerial resources, lack of leading edge equipment and manufacturing facilities, together with a lack of customer knowledge. This information was also confirmed by the secondary data sources, and examples especially of lacking customer service knowledge were given by several of the interviewees.

Although these results are fairly in line with theory, the concept of EO needs to be reconsidered in the perspective of a developing nation. At least this goes for Sri Lanka, but can be suspected to apply for similar developing economies (thus, the authors call for further research in the field). Innovation levels seemed to be high but, in contrast to theory, this did not help to explain growth in the industry. Though, what can be stated with statistical proof is that pure innovation-led activities such as R&D (as the dimension of innovativeness means) does not take place to any higher extent. Thus, the innovations in the investigated industry rather seem to be of incremental nature, than revolutionary new-technology development. Thus, firms behave more proactively than innovatively.

So how can these result help to create a better software industry in Sri Lanka, and does it mean something for the theoretical frameworks of RBV and EO? Although a deeper discussion is presented in the 'implications for firms and policymakers' section, it should be stated here that the results indicate that the industry seems to be heading the right way. However, as innovativeness is of such a low relevance to growth, it could be said that developing key technologies and driving change in that direction may not be recommended for a country like Sri Lanka. Instead, aims should be focused on finding niche markets and technologies in which products and services can be created with the knowledge unique to Sri Lanka. Also, in regards to innovativeness, evidence clearly shows that innovative

behaviour in terms of proactiveness quite strongly contributes to growth. Thus, revolutionary technology development might not be suitable (if not a niche-market is targeted), but rather it is recommended to be in the forefront of development by adapting new technologies fast, and take on the improvement and innovations from there.

Further, although the RBV can be held consistent with the findings from this study, the factors identified as important are very much related to knowing customers and knowing how to make products that meet their needs. It should be an indication for firms to get access to better market and customer information channels, and in that way improve their chances for gaining customers and ultimately grow.

The EO framework, which, according to theory, should contribute significantly to growth was not proven to be fully right for this case. Although the levels of EO were high, no general relations could be found indicating that the beliefs behind the EO theories holds completely true for the Sri Lankan software industry. With other factors showing greater explanation to growth, having every dimension of EO is perhaps still only a proven way for companies in the west to compete. In Sri Lanka, and probably other similar nations, better results can still be derived by competing with their primary weapon, cost efficiency. This does however not exclude the possibility that a change may be occurring in the industry, and movement towards a more innovation driven software industry may be on its way (such as the case of an open source market niche).

So, to conclude, the opening quote stated the importance of change. The authors believe it has been proved that change is important, and being proactive even pays off. What Darwin discovered impacted natural science, and later business as well, but he forgot one important feature of *natural selection* and the *survival of the fittest*, namely that in order to survive they also have to be the best ones managing change.

7 Final discussion

In this chapter of the thesis, a discussion of the study is presented as final remarks. Implications for firms and policy makers, reflections, method criticism, trustworthiness of the study are discussed, together with the contribution of this study to the field of research. Finally, the chapter, and thesis, will end with and suggestions for further research related to the treated subject

7.1 Implications for firms and policy makers

The findings from this thesis will hopefully help to create some advice for the firms acting within the software industry on Sri Lanka, and the policy makers trying to help it grow. Here follows a list of possible advice:

- It is important to have good and qualified employees, especially when it comes to management, marketing and customer services, and in product development (experience, new ideas and technical skill). However, these resources will prove useful when they are used in the best possible way. Identified in this thesis, their ability to keep updated and monitor industry trends, technologies, and competitors will be of utter importance in maintain a leading position within the industry. Basically, proactiveness matters, and it has significant effect on the sales of a firm.

- Contrary to belief, most firms do not experience constrains in capital, however, it is in the logic of entrepreneurship and small business development that firms that want to grow quickly need are dependent on a lot of capital. Examples can be seen in young, quickly growing, firms which are highly present in the industry. These will need better support function from Sri Lanka, especially in terms of promoting the country for venture capitalists, providing loans and similar financing solutions.

- Innovation did not show any relation to growth. This could be explained by several factors including that the meaning of the word innovation is perceived differently between different respondents, but it could also be the innovation taking place is not good enough or that products are created which have no market value (no demand). With support from theory, it is important that the innovation taking place will actually provide value to customers; otherwise time should be spent on more lucrative business areas.

- After meeting several prominent industry representatives (CEO's, professors, board members of SEA and SLICTA, and officials from ICTA), it has been understood that on a firm level, businesses are trying to find niches where they can thrive, and on a national level, Sri Lanka has identified a few areas where they can be the best. According to this study, it is also seen that if efforts can be focused on the right activities and knowledge can be gained in very specific areas, product with higher market value can be created and instead of being just proactive, firms can actually start being the global market leaders. Several of these firms are under development in Sri Lanka, where WSO2 and Open World Lanka provide examples of firms aiming and possibly succeeding in their missions. The intent to make Sri Lanka a world class hub for Open Source is one of these initiatives which could turn Sri Lanka's software industry into being an innovation-driven industry.

- Constrains to resources still limit the industry, and it is seen both according to secondary and primary data that demand is sometimes higher for resources than the

supply. Although educational levels are increasing, there is a need for additional business knowledge to be applied to classic technical education, if the students are to be ready to enter a quite international business environment (like that of the software industry).

- In further regard to resources, although not presented by the survey, interviews present a picture where there are heavy challenges in regards to infrastructural and broadband resources. The expense of broadband is far higher than other parts of the world and the speed is not fast either. In order to become truly competitive, it is important that (in other countries minor issues) become factors that hinder the potential of the firms to succeed and meet their customer requirements.

7.2   Criticism and trustworthiness of the study

A lot of factors can affect the research whenever conducting it; the method, data collection and presentation together with the different conclusions drawn have to be put up for scrutiny. This section is provided as a response to this. It is vital to take the criticism into consideration since it might have impacted the research findings.

This study was a little particular since data was collected from a large percentage and sample of a small total population. The impact of this was especially apparent in the statistical methods previously used in testing EO, where for example multiple regression models and other scales based on normal distribution of a large population were used. The fact that these tools could not be used efficiently for the analysis naturally brought with it shortcomings. However, since such a large part of the population was taken into consideration, it was believed that normal distribution was not necessary since it could actually be seen how the industry looked from the collected data. It was assumed that a more qualitative approach to data analysis, using primarily correlations but also looking at means and scatter plots could be just as effective *for this case.* These methods are valid as long as the data is continuous.

If conducting this study again though, the authors would chose an industry with a larger population and sample more firms, allowing for classic statistic tools to be used fully efficient. The methods used for analysis in this case can thus not be said to have the same validity and reliability if used on a large population, with a sample covering a relatively small percentage of the total population (usually, studies look at a sample of about 5% of the total population, which is often many thousand firms).

Further, the variables for measuring growth could have been changed, or more could have been included. As concluded by Hoy, McDougall and Dsouza (1992) the most common, and accepted growth variable among academics, are sales- and revenue growth. Because of aforesaid arguments revenue growth could not be included, and the authors further added employee growth as variable. When looking at EO, it may be appropriate to look at more growth factors than employee growth and sales growth. Other factors may include increase in customers, number of new products, number of new patents and so forth. It can be argued that a multidimensional performance variable could have been constructed, so to measure the actual *performance* of the firm more accurately. Looking at only two factors of growth may have contributed to a more narrow minded study of EO and resources, than could have been achieved by looking at a performance variable as well. Though it would be interesting to see the relations between the investigated construct and such a variable, it

was not feasible to do so in the present study (due to information problems and lack of transparency in companies).

The method chosen for this master's thesis was both of quantitative and qualitative nature, although the quantitative approach corresponds to the purpose and shall be seen as the major component of the method. It can be discussed if methodological approach taken was the best possible to choose when conducting the study. However, the view of development of knowledge, the authors' intent to generalize the results, and the method of answering the purpose, etcetera, is all consistent with a qualitative study. Though, it can further be argued that one would gain more in-depth knowledge (though narrower) into the industry if a purely qualitative study would have been conducted. Also, since the whole industry is quite small, this might be seen as to support another methodological approach. However, it was the belief of the authors that the smallness of the industry would further justify a quantitative approach since such a large part of the population could be sampled, increasing the reliability of the study.

Furthermore, the contribution of the qualitative to the present study could be questioned. However, since the topic and area researched (the software industry of a developing nation) were new to the authors, it was believed that this would increase the understanding of the industry, the background, its future, the problems, and roadmap to further development. However, the interviews and interactions with firms within the industry, officials at governmental agencies, professors at prominent universities, etcetera, did not only serve as an instrument to increase the understanding of the industry, but also provided the thesis with examples of how firms' in the Sri Lankan software industry actually operated. Moreover, to increase the reliability, the primary data was backed up by secondary data, all pointing at the same direction.

Moreover, the reliability is further believed to be high, since the results are based on the quantitative study which served approximately 40% of the population, and the accuracy of the measure instrument (which have been tasted numerous times in the past, and is accepted as highly reliable). Thus, under the same circumstances it is highly probable that the results would turn out the same. Also, it is the belief of the authors that the validity is high. Even though evidence indicates that the measured EO relationships becomes weaker when English is not the mother tongue of the population, the questions used have profoundly been developed to correspond to high validity and are still the ones accepted to measure EO, resources, and environment. Therefore, what was intended to be measured is most likely also what was measured.

Lastly the method for surveying the population, by using a web survey, can be questioned as the best alternative. Although it was assumed that all software firms had access to the internet, the authors have concluded that it would probably have been better if the surveys would have been handed out, and collected, in person.

7.3   Suggestions for further research

Although the research topic of EO has existed for about 20 years, it is not until lately that it has gotten a revival in academic literature. Similarly, the RBV is a fairly young theoretical framework, which seemingly grows by the day and is more and more becoming a paradigm of itself.

This thesis tried to apply these frameworks to a new and untested situation by looking at the small, dynamic and growing software sector on Sri Lanka. Hopes were that findings

from this study would either confirm the beliefs of previous researchers, or find differences applicable to developing nations and dynamic markets. However, as the population of Sri Lankan software firms is quite small, it would be useful to look at the framework, with some adjustments in regard to the present study, in another developing nation with a much larger population of firms. India and China could prove very interesting as they hold thousands of software firms, and generalizations from their findings could be approved at much higher levels than that of the small population of Sri Lanka. Further, the statistical tools could come to better use when normal distribution can function in a better way.

It is also the beliefs of the authors that more research needs to be done on entrepreneurship, innovation systems and clusters, together with small business development, in the context of developing nations. Current research is primarily focused on firms and business environments in the developed world, but those that can really find research efforts useful are those that need to find a sustainable way to reach economic growth.

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Appendix 1: The Survey

Note: the survey was internet based, so it can be seen on http://srilankasurvey.plutoprojects.com in its real version.

SURVEY ON RESOURCES, STRATEGY AND GROWTH

A study of the Sri Lankan software industry

Completing this survey will hopefully **help your firm** *and create an understanding for the resources and strategies that drive performance on the Sri Lankan software industry. It takes approximately* **10 minutes** *to complete. All the individual answers will be kept* **confidential** *according to Swedish law. The results will be sent to you when we complete the study in June.*

The purpose of this brief survey is to be able to objectively gather data about Sri Lankan IT firms, their access to resources and their attitude towards entrepreneurial activities and behaviour. The aim is to evaluate and better understand what determines the opportunities for growth in a largely dynamic market and in a country where there could potentially be constrains to resources, infrastructure etc. It is part of a Master Thesis written for Jonkoping International Business School (www.jibs.com).

We will begin with some very general questions about the firm and yourself. Please write or check off the most appropriate answer.

A. The name of the firm is: _____

B. When was the firm founded? _____

C. Approximately how many full-time employees did the company have in the following years:

        2005:_____

        2004:_____

        2003:_____

D. Approximately what were the firm's sales for the following years:

        2005:_____ Rs

        2004:_____ Rs

        2003:_____ Rs

E. Which of the following best describes your present position in the company?
- ☐ Founder
- ☐ CEO
- ☐ Upper-level manager
- ☐ Middle manager
- ☐ Public relations manager
- ☐ Other, namely _____

F. How long have you worked for the company? _____ years

The following section uses opposite statements in order to gauge your attitude towards different questions. Here is an example of how one answers an opposite statement:

The firm has very many routines and rules 1 ② 3 4 5 6 7 The firm has few routines and rules

The person who answered above felt that the firm has quite many rules and routines, thus the left statement was more correct than the right one. If you were to totally agree with the right statement, you would circle in a 7.

My firm…

Is satisfied with our current situ have no motivation to grow.	1 2 3 4	Has a strong wish and motivatio and expand further.

In general, the top managers of my firm favour…

A strong emphasis on the mark true products or services.	1 2 3 4	A strong emphasis on R&D, te leadership, and innovations.
Imitating methods other firms l their problems.	1 2 3 4	Experimentation and original a problem solving.

In general, the top managers of my firm have…

A strong proclivity for low risk normal and certain rates of retu	1 2 3 4	A strong proclivity for high risk chances of very high returns).

In general, the top managers of my firm believe that…

Due to the nature of the enviro explore it gradually via careful, behaviour.	1 2 3 4	Due to the nature of the enviro ranging acts are necessary to ac objectives.

When confronted with decision-making situations involving uncertainty, my firm…

Typically adopts a cautious, 'wa in order to minimize the probal making costly decisions	1 2 3 4	Typically adopts a bold, aggress to maximize the probability of opportunities.

In dealing with competitors, my firm…

Typically responds to actions w initiate.	1 2 3 4	Typically initiates actions which respond to.

Is very seldom the first business products/services, administrativ operating technologies, etc.	1 2 3 4	Is very often the first business t products/services, administrativ operating technologies, etc.

In general, the top managers of my firm have…

A strong tendency to follow the leader' in introducing new prod	1 2 3 4	A strong tendency to be ahead competitors in introducing nov
A strong tendency to follow the leader' in introducing new prod	1 2 3 4	A strong tendency to be ahead competitors in introducing nov

As a general rule…

We prefer tight control of fund means of sophisticated control systems	1 2 3 4	We prefer loose, informal contr dependence on informal relatio
We strongly emphasise getting following formal processes and	1 2 3 4	We strongly emphasise getting this means disregarding formal
There is a strong emphasis on g adhere to their formal job descr	1 2 3 4	There is a strong tendency to le of the situation and the persona dictate proper job behaviour.
Most job-related communicatio down the organization.	1 2 3 4	Most job-related communicatio

How would you characterize the environment in which your firm acts?

Very safe, little threat to the we of my firm	1 2 3 4	Very risky, a wrong step can mc my firm
Rich in investment and marketi	1 2 3 4	Very stressful, exacting, hostile; afloat
An environment that my firm c manipulate (such as the situatio firm in a market with few comp	1 2 3 4	A dominating environment, in y initiatives count for very little ag tremendous political, technolog forces

The following items are representative of resource availability. Please rate them in terms of whether or not accessibility to the specified resources places you at an advantage or disadvantage.

			Neithe di			
Grea	Signific	Sligh		Slig	Signi	G

1.   Availability of capital………………………………………… 1   2   3   4   5

2. Leading edge plant/equipment/production facilities……………… 1 2 3 4 5

3. Marketing expertise…………………………………………… 1 2 3 4 5

4. Managerial expertise…………………………………………… 1 2 3 4 5

5. Technical (programming) expertise………………………………… 1 2 3 4 5

6. Expertise in product/service development………………………… 1 2 3 4 5

7. Expertise in customer service…………………………………… 1 2 3 4 5

8. Expertise in process technology………………………………… 1 2 3 4 5

9. Highly productive employees…………………………………… 1 2 3 4 5

10. Access to resourceful social and business networks……………… 1 2 3 4 5

11. Access to low cost labour……………………………………… 1 2 3 4 5

12. Access to low cost raw materials ……………………………… 1 2 3 4 5

13. Access to low cost distribution channels……………………… 1 2 3 4 5

14. Flexibility to adapt to new industry and market trends…………… 1 2 3 4 5

15. Employees trained to provide superior customer service…………… 1 2 3 4 5

16. Employees with innovative, new product/service ideas…………… 1 2 3 4 5

17. Employees with creativity and new ideas within marketing………… 1 2 3 4 5

Appendix 2: Question guide/Code index for survey

P2NY. Willingness to grow

Questions on the dimension of EO

P2C1. Emphasis of R&D and innovation (Innovation 1)

P2C2. Experimentation and problem solving (Innovation 2)

P2C3. Risk of projects and their returns (Risk 1)

P2C4. How the environment is explored (Risk 2)

P2C5. Decision making in uncertainty (Risk 3)

P2C6. Response/actions to competitors (Proactiveness 1)

P2C7. Introducing new products/services etc. (Proactiveness 2)

P2C8. Follow/lead global competition (Proactiveness 3)

P2C9. Follow/lead local competition (Proactiveness 4)

P2C10. Control systems/informal control (Autonomy 1)

P2C11. Formal processes procedures/Getting things done (Autonomy 2)

P2C12. Adhering/disregarding formal job descriptions (Autonomy 3)

P2C13. Vertical/horizontal org. (Autonomy 4)

P2C14. Market hostility (Environment 1)

P2C15. Opportunities (Environment 2)

P2C16. Firm influence on environment (Environment 3)

Questions on resources

P3C1. Availability of capital

P3C2. Leading edge equipment and development facilities

P3C3. Marketing expertise

P3C4. Managerial expertise

P3C5. Technical /programming expertise

P3C6. Expertise in product/service development

P3C7. Expertise in customer service

P3C8. Expertise in process technology

P3C9. Highly productive employees

P3C10. Access to resourceful social and business networks

P3C11. Access to low cost labour

P3C12. Access to low cost raw materials

P3C13. Access to low cost distribution channels

P3C14. Flexibility to adapt to new industry and market trends

P3C15. Employees trained to provide superior customer service

P3C16. Employees with innovative, new product/service ideas

P3C17. Employees with creativity and new ideas within marketing

Appendix 3: Presentation of key organisations surrounding the Sri Lankan software industry

Information and Communication Technology Agency (ICTA) – ICTA is a governmental entity operating under the presidency's office, and was created to implement the initiative of e-Sri Lanka, which concerns development of information infrastructure, ICT human resources, modernizing government and delivering citizen services, leveraging ICT for economic and social development and also promoting Sri Lanka as an ICT destination.

Software Exporters Association (SEA) – consists of a group of companies in Sri Lanka engaging themselves in outsourcing activities of software development and export of software products, services and solutions.

SEA has a vision of reaching a position and attaining the status of a *first league* software exporting country in the world in the year of 2012. Additionally a goal is set by SEA to be a one billion dollar (USD) export industry and among the top three export industries within the same period of time.

Sri Lanka Association of Software Industry (SLASI) – is a national organisation of 51 members, formed in 1992, representing the Sri Lankan software industry. The members are the ones conducting business in the development of software and related services.

Appendix 4: People referred to (personal communications)

Dr. M. Thynell, personal communication, 2006-03-03 (methodological advisor MFS Sida)

Dr. S. Weerawarana, personal communication, 2005-12-23.

Mr. R. Ganeshan, personal communication, 2006-03-23

Ph.D. T. Marikar, personal communication, 2006-04-04.

Mr. D. Perera, personal communication, 2006-04-04.

Mr. M. Azmeer, personal communication, 2005-04-10

Mr. M. Sekaram, personal communication, 2006-04-18

Mr. C. Suraweera, personal communication, 2006-04-20

Mr. C. Casiechitty, personal communication, 2006-04-27

Dr. S. Weerawarana, personal communication, 2006-04-25

Prof. V.K. Samaranayke, personal communication, 2006-04-06

Appendix 5: Presentation of interviewees and their firms/organisations

Mr. Mohammed Azmeer, CEO of the Concept Nursery and Crescent Holdings, board member of the SEA

The Concept Nursery is an incubation centre for software and it firms, located just outside of Colombo. During its existence it has raised and helped many interesting firms which are still present and prosperous on the market today. Some of the graduated firms have been present in the quantitative study as well. Mr. Azmeer's carrer started off as a founder of a software firm in the middle 90's. This firm was later sold to the US, and Mr. Azmeer continued his path to develop the software industry of Sri Lanka further. Besides running the Concept Nursery, he has also founded and manages the small, but thriving, Crescent Holdings (founded 2005, employing 5 people), providing web solutions to a number of large firms in and outside of Sri Lanka.

Mr. Azmeer also holds a chair in the board of the SEA, where he focuses a lot on the development and growth aspect of the industry. He has been part of setting the USD 1 billion export target by 2012, and strongly believes it could be reality. With his great insight and experience of the industry, Mr. Azmeer made a very good interviewee for the study.

Dr. Tariq Marikar, CEO of Teamwork Technology and Director at Suntel

Teamwork Technology is a Swedish owned software development firm located in Sri Lanka, but with sales and marketing functions in Sweden. It was founded in 2000 and has since then grown to over 35 employees. They provide customized web and software solutions for clients in Sweden, Europe and also in Sri Lanka. The founder, Mr. Micheal Höglid, was a co-founder of the Swedish Manpower (which went under the name Teamwork before being acquired by Manpower International).

Dr. Marikar is a well experienced, yet young, executive holding a Ph.d. in advanced engineering and project management. Although having worked abroad, for several reasons he chose to return to Sri Lanka to continue a successful career in his home country. Having positions both within a growing software firm, and the telecommunications firm Suntel gives him a superior overview over the industry and thus has a lot of opinions on what can be made better.

Mr. Mano Sekaram, CEO of Eurocenter DDC

Eurocenter DDC is a growing company providing a highly specialized and process oriented outsourcing service for mainly small software firms in Scandinavia. Their main service is to develop software companies existing products further, by adding extra value to the products and thus increasing their attractiveness on the market place. In Mr. Sekaram's words, 'we help other firms to grow by increasing their products value, and in turn, we grow'. Started in 2000, they currently employ over 60 people.

Mr. Sekaram is well experienced in the field, having worked in different IT-firms, both in Sri Lanka and abroad. He has a clear vision for Eurocenter and hopes that the firm will be able to expand and grow a lot during the years to come. One of the wishes is to extent their current market to better include Swedish software firms in their customer base.

Mr. Chaminda Suraweera, Operations Manager at Ocean Software

Ocean Software is one of the few firms in the Sri Lankan software industry focused on providing business intelligence solutions. The firm is owned by a British person, with sales and marketing offices in Bath, England. It currently employs 16 people, and was founded in 2001. The Sri Lankan technical staff take turns in attending the offices in Bath, where there is often between three and five developers.

With a technical background and a history of work within the Business Intelligence niche (at the former BI department at John Keels Computer Services), Mr. Suraweera has followed the growth and development of the software industry during his time as a developer and later manager.

Mr. Clyde Casiechitty, IT manager at Open World Lanka

Open World is a company with a very unique niche, offering web interfaces for the leading hotels of the world. Their development centre is a separate company located on Sri Lanka, under the name Open World Lanka. The rest of the firm consists of marketing offices in London, New York, Singapore and one under construction in Shang Hai. The Sri Lankan company has grown rapidly, now employing over 80 people although only 4 years old.

Mr Casiechitty has been with Open World Lanka for about one year, and tells a story of a quite unique company compared to many of the ones previously interviewed. With a degree in computing, Mr. Casiechitty has worked for Informatics, one of the nations leading IT firms, before being recruited to Open World. With a position of IT manager, his overview of the firm and the latest trends in the industry are both broad and deep.

Dr. Sanjiva Weerawarana, Founder and CEO of WSO2, founder of LSF

Dr. W was the first person that the authors were in contact with, discussing the Sri Lankan software industry. His enthusiasm and entrepreneurial spirit was one of the reasons to why this industry was chosen for the study. WSO2 is a software firm started in 2004, working to lead the way in certain open source areas. Great emphasis is put on being the latest and being the most innovative, as the open source world is a quite tough and dynamic arena.

Dr. W has loads of experience after working for IBM's open source department as a project leader and developer, being one of the masterminds behind some of today's many interesting open source programs. He came back to Sri Lanka to help out after the Tsunami (by developing disaster management software through LSF), and to start WSO2.

Mr. Dinuka Perera, Project Manager at ICTA

ICTA is the Information and Communications Technology Association, operating right under the president's office to promote ICT growth, development and usage both within the private sector and in the communities. With the intention to make the nation fully IT adapted, they struggle with prioritizing between issues. Increasing IT educated workforce, private sector IT usage and rural connectivity are just some of the tasks worked on.

Mr. Perera has worked with ICTA for three years, moving back to Sri Lanka from Canada with the intention to contribute to the development of his home country.

Professor Samaranayke, founder and professor of Colombo School of Computing, Colombo University, President of ICTA

Professor Samaranayke is one of the most well respected scholars in Sri Lankan, and has been a contributing force to the development of the IT and software industry at large. Although officially retired, he attends several positions and plays an important role in the IT community of Sri Lanka.

Representing the educational side of the study, Professor Samaranayke has contributed with opinions and information on the challenges facing universities, students and firms to be able to successfully compete in the global software industry.

Appendix 6: Factor analysis, and Cronbach's alpha of EO and its dimensions

Component Matrix(a)

	Component			
	1	2	3	4
P2C1	,601	,159	,215	-,224
P2C2	,776	,256	-,048	,107
P2C3	,599	,070	,273	,532
P2C4	,160	,330	,654	-,430
P2C5	,356	-,044	,617	,317
P2C6	,820	-,061	-,255	,213
P2C7	,739	,178	-,446	-,063
P2C8	,640	,257	,303	-,473
P2C9	,675	-,003	-,495	-,289
P2C10	-,328	,734	,054	-,041
P2C11	-,392	,761	-,259	-,067
P2C12	-,127	,839	-,115	,009
P2C13	,041	,692	,011	,501

Extraction Method: Principal Component Analysis.
a 4 components extracted.

Reliability Statistics - Proactiveness

Cronbach's Alpha	N of Items
,782	4

Reliability Statistics – Risk-taking

Cronbach's Alpha	N of Items
,482	3

Reliability Statistics - Innovation

Cronbach's Alpha	N of Items
,587	2

Reliability Statistics - Autonomy

Cronbach's Alpha	N of Items
,800	4

Appendix 7: Sampled firms

Accsoft Solutions Ltd

Advanced Business Solutions

Affno (SEA)

AIMS Computer International

Asiasoft

Barcode Automation Lanka

Bartleet Electronics Ltd.

BC Computers

CodeGen International

CyperSoft

Debug Computer Software

Delvon Computers

DesignSoft Technolgoes

DMS Software Engineering

E-Commerce Technologies

EAP Technologies

Ecode Lanka Software

Em Prise IT

Enterprise Technology

Epic Lanka Software

ePlanet Business Solutions

eSenze Business Solutions

Eureka Technology Partners

Euro Center DDC

E-W Information Systems

E-W Solutions

E-W Systems

Excel Technology Lanka

Excelsoft

Genesis Software

Greenwhich Lanka

Handheld Technologies

Hsenid Software

Inoformatics International Ltd.

iOM Lanka

Interblocks

ITABS Lanka

John Keels Computer Services

Just In Time Holdings

Kingslake Engineering Systems

Lanka On-Line

Mechanised Business Applications

icroimage Ltd.

Millenium Information Technologies Ltd.

Mindspring

OpenArc Management Systems

OceanSoftware Ltd.

PC House

Qsoft

Sabre Technologies

Sanje Lanka

Seven Seas Computers Lanka

Softech

Softlogic

South Asia Software Solutions

Tech Distribution Lanka

TechSys

Texus Information Systems

The Golden Key Co

Trilobytelabs

Virtusa

Walksideways.lk

WaveNET

WSO2

Zeelabs

ZILLIONe Systems Solutions

Computer Systems Limited

DMS Software Technologies

Teamwork Technology

Cresent

Vesess

Zmessanger

Appendix 8: Interview guide

Resources & Capabilities, Strategy, Entrepreneurial Orientation

What do you find an advantage being a software firm in Sri Lanka, as compared to other countries around the world?

What do you find a disadvantage being a software firm in Sri Lanka?

How do you convert being established in Sri Lanka to your advantage? What do you do to differ (be unique) from other firms on the market?

How do you find customers, and how do you work with them?

How do you look at growth? Is it something you aim for or is it not a goal in itself?

Organisational structure

What does your organisational structure look like? Do you have a hierarchy structure? In general, what type of organisational structure is used in Sri Lanka? Hierarchy, flat org? What's the case in your firm?

Autonomy

What is your view on creativity and the importance of such in generating growth?

If someone would like to initiate a new product within your firm, would he be able to work on that independently?

Do you take any actions to foster new ideas on all organisational levels? From bottom up to top management?

Innovativeness

Does your firm encourage and stimulate technology, product-market, and administrative innovation?

How does your firm stimulate creativity and experimentation?

Does your firm properly invest in new technology, R&D, and continuous improvement?

Are your firm's innovative initiatives hard for competitors to successfully imitate?

Proactiveness

Does your firm continuously monitor trends and identify future needs of customers and/or anticipate future demand conditions?

Does your firm strive to be a 'first mover' to capture the benefits of being an industry pioneer?

Does your firm introduce new products and technologies ahead of the competition and continuously seeking out new product or service offerings?

Risk-taking

Does your firm foster and encourage a proper level of business, financial, and personal risk-taking?

Overall, does your firm carefully manage risks and avoid taking actions without sufficient forethought, research, and planning?

In general, what is your view on risk-taking in your business, and how does your firm tackle risk?