Chapter 1

Introduction

1.1 Problem statement

"South Africa's recent integration into the world economy provokes the question about its potential for building competitive advantage and prosperity at the local level in the context of an increasingly globalised economy. The experience of prospering localities in industrialised countries, in particular Western Europe and Japan, suggests that the small and medium-sized enterprise (SME) sector is at the forefront of local economic development. SMEs are reported to resolve the persistent problems of insufficient employment growth while being highly efficient in flexibly serving increasingly segmented consumer markets" (Kesper, 2000:1). Kesper (2000:2) refers to work done by Papoutsis (1996) which highlights that the importance of fast-growing SMEs is supported by recent research by the European Commission showing that enterprises characterised as fast-growing SMEs contribute 50% of net job creation. Schramm (2004:106) refers to research by the U.S. Census Bureau and others that found that most net new jobs are created either by start-up companies or by firms in a rapid-expansion phase. Furthermore, that new firms in the U.S. are engines of innovation and employment growth.

Start-ups[1] are significant drivers of change and Minshall et al (2005) citing Timmons (1998) comment that most of the radical innovations since 1945 have been driven by start-ups rather than established businesses. However, technology-based start-ups have a high failure rate – typically in the order of 60%-70% and depending on the type of venture and the time interval considered (Garnsey, 1998). The reasons for this high failure rate are multiple and varied. "The ability to identify opportunities, and to access and exploit resources and competences to create new value from this opportunity" remains a challenge for start-ups (Minshall et al, 2005). Established firms have the benefit of being able to source resources and competences either internally, or to access them by leveraging their existing resources (eg by borrowing against collateral). One of

[1] Start-ups are defined here as firms less than 10 years old and that also conform to the European Commission's definition of an SME, namely less than 250 employees, turnover less than 40 million Euros and a balance sheet total of less than 27 million Euros.

the ways that start-ups can overcome these constraints is to partner with a firm that has the much needed resources and capabilities. Furthermore, partnerships not only allow risk and reward sharing, but also afford a start-up legitimacy – or a "stamp of approval" Minshall et al (2005). Tracey and Clark (2003:1), citing Teece (1990:4) who refers to Schumpeter (1943) suggested that there were three reasons for assuming a link between firm size and innovation: "only large firms could afford the cost of R&D programs; large, diversified firms could absorb failures by innovating across broad technological fronts; firms needed some element of market control to reap the rewards of innovation". However, during the last quarter of the Twentieth Century, with the success of the information and knowledge economy in regions such as Silicon Valley, the importance of small firm development has become an area of study.

From the above it is apparent that SMEs are important for local economic development. Furthermore, partnering with a large company can be a pragmatic solution in overcoming the constraints faced by a small company wishing to grow. The reality is, however, that many a small company has suffered at the hands of a large company. Specifically in the technologically innovative industries there is much anecdotal evidence of unsuccessful partnerships between small and medium sized enterprises (SMEs) and large companies (LCOs) where, in general, the SMEs are left in a worse off situation than prior to the partnership. It is therefore fair to question that if the risk of a partnership relationship is considered to be high, why do SMEs consider the option of a partnership at all? This chapter explains what led to an exploration of the factors affecting a successful partnership arrangement between technology innovative small and medium sized companies (SMEs) and large companies (LCOs). It reflects on literature that highlights the dynamic environment in which SMEs and LCOs operate, the need for innovation to ensure competitiveness and sustainability, strategies for surviving in a turbulent environment and the need for networks and partnerships – specifically between LCOs and SMEs, and the typical problems experienced in such partnerships. The main problem of partnership failure between LCOs and SMEs is identified and the key issues this study proposes to resolve.

Partnering with an LCO is often part of the commercialization strategy of an SME. The reason for this partnership is that SMEs typically develop their business around an innovative product or service, and the founders are usually technical experts who often lack business and marketing skills, and access to markets. By forming a partnership with a larger, more experienced company, the SME can "piggy-back" on the marketing and business infrastructure of the LCO. This opens up, inter alia, marketing and distribution

channels for the SME as the LCO already has a presence in the market (often boasts an established brand), with established sales and distribution channels. Rather than having to defocus its limited resources (financial and human), the SME can concentrate on technical development and support whilst relying on the LCO for the marketing and sales support. A symbiotic relationship where both companies perceive the partnership as a win-win situation is important for the partnership to be effective and successful. Achieving a win-win status is, however, not necessarily as simple as it sounds. What follows are two anecdotal case studies indicating how SMEs may be subject to foul-play by LCOs because of the SME's limited resources and hence inability to respond because of its poor positional power. These examples set the scene for the further discussion that follows.

Case Study 1: Breach of patent by LCO
(names of companies have been withheld to protect their anonymity)

SME X was a start-up company that joined a business incubator in South Africa. SME X developed a product that was a novel and very relevant security application for the banking sector. This product would have provided the first bank to implement the solution with a competitive advantage. SME X filed for Patent Cooperation Treaty protection, where after it initiated discussions with one of South Africa's major banks. The bank (who shall be referred to hereafter as LCO X) was very interested in the product and therefore was willing to enter into a non-disclosure agreement (NDA) with SME X for a period of 12 months, during which time SME X would disclose additional technical information to enable LCO X to make an informed decision in terms of whether to invest in the product or not.

LCO X evaluated the product and expressed keen interest, but would not commit to purchasing the product from SME X - no definitive answer could be obtained from LCO X as to its future intentions. One month after the NDA expired, however, SME X was contacted by another SME (SME Y), who indicated that they had been requested by LCO X to develop a product, the specifications of which had been supplied to them by LCO X, and having done an internet search, SME Y believed that SME X might be able to assist them in clarifying some of the specifications. SME X indicated to SME Y that they had in fact developed the product, and were awaiting PCT patent approval. SME X never heard from SME Y again.

Once SME X's PCT (Patent Cooperation Treaty) application was approved and the international provisional patent granted, SME X contacted LCO X to inform them of the provisional patent approval, also mentioning that any further development by LCO X on their (SME X's) product would be seen as a breach of the patent. LCO X ignored the warnings from SME X and introduced the product into the market as one of their own developments. The attitude that LCO X had adopted was one of "sue us if you wish", knowing full well that SME X had neither the financial nor the time resources to take them to court.

The attitude displayed by LCO X is not untypical in the South African environment, and there is considerable anecdotal evidence to suggest that South African LCO's are aware that SME's have neither the money, nor the time, to litigate in the case of a breach of patent. Aware of the lack of power of SMEs to litigate in the case of a breach of patent and or other rights, the LCOs can exploit intellectual property (IP) that has been developed by the SME without any fear of retribution.

The reader may be asking why did SME X not consider launching a media campaign to discredit LCO X for displaying such opportunistic behaviour? The reality is that such an activity would have made SME X very vulnerable and could have resulted in it going bankrupt in any litigation that might have be initiated by LCO X as a retaliatory measure. For example, should LCO X have sued SME X for defamatory remarks and should the case have ended up in court, because of the technical nature of the case the arguments for and against might not necessarily have been

properly understood by the presiding judge such that the judgement might have gone against the course of justice and hence against SME X. The chances of this happening are pretty high, considering the fact that LCO X would in all likelihood have sufficient resources to hire expert counsel, whereas SME X would not have been able to afford the best counsel.

The above case study illustrates a common problem experienced by SMEs in South Africa in particular, and this problem may well hold true for companies in other countries. For example, De Wet (2002:3) cites Ulrich Scmoch of the Fraunhofer Institute for System and Innovation Research in Germany in commenting that "large competitors often besiege small companies that hold valuable patents. The small players will regularly abandon patents when faced with costly litigation leaving the larger with all the power."

Case Study 2: Lack of bargaining power of SME

A second anecdotal case study demonstrating the vulnerability of an SME when dealing with a large company, that appeared in "Brain Business Brief" (May 2005), is discussed below. Although this case study pertains to an exploitive *supplier* relationship rather than a *technological innovative collaborative* relationship, it illustrates the lack of recourse an SME has because of limited resources to resist opportunistic behaviour by LCOs.

"The amazing David and Goliath story of business owner Jim Foot is far from over as petrochemical giant Sasol prepares to appeal against the case they lost at the Competition Tribunal recently. Foot, who blazed a trail for South African small businesses by being the first to take a large corporate to the Competition Tribunal for anti-competitive practices, has spent nearly a year out of his business in order to fight the case. His business partner Brian Oxley shouldered the burden of running their 25-employee tar pole manufacturing business near Uitenhage in the Eastern Cape.

Foot argued that Sasol was being anti-competitive by charging him 18% more for creosote, a chemical used for the treatment of poles, because he was too small to qualify for bulk discounts. The Competition Act states that a dominant supplier - any supplier with between 35% and 45% market share - must charge the same price to small and large buyers alike, unless it actually costs them more to deliver to small suppliers. The Tribunal found that delivery to Foot's business, Nationwide Poles, did not cost Sasol any more than delivery to a large supplier, and that the higher price charged to Foot was indeed unfair. Sasol, arguing that large clients mean more stable business, thereby justifying bulk discounts, has announced that they have appealed against the Tribunal's decision."

Reporting on the story of Foot, Timm and Terblanche (2005:14) conclude that "dominant corporates and cartels … hurt business owners, but not so much on the bottom line of their businesses, as on an emotional level".

The above two case studies highlight the problems that result at the partnership interface between an LCO and an SME. In the first case the problem arose because of the SME's lack of resources to enforce retribution arising from a breach of patent. In the second case an imbalance of power in the partnership affected the negotiation power of the SME such that it was unfairly disadvantaged. In both cases opportunistic behaviour was displayed by the LCO.

Given their inherently weaker negotiation and enforcement position, we may question why SMEs consider partnerships with LCOs at all? What follows is a sketch of the business environment and context in which today's companies find themselves, exploring some of

the drivers of partnerships in an attempt to understand why SMEs partner with LCOs and vice versa. In addition some of the major issues at stake affecting partnerships between SMEs and LCOs will be explored.

1.2 Doing business in uncertain environments

Today's business environment is characterized by uncertainty. Dickson and Weaver (1997:406) discuss the various sources of perceived uncertainty. Citing Milliken (1987:137) they refer to "effect uncertainty" where the head of the firm is unable to assess "the nature of the impact of a future state of the environment or environmental change will be on the organization". This uncertainty includes changing product markets, changing barriers to foreign trade and investment (Auster, 1987), and changing economies of scale (Murray and Siehl, 1989). A second source of perceived environmental uncertainty is the technological environment of a firm which includes technological complexity and volatility. The third source of uncertainty is the inability to predict certain components of the environment, like the response of competitors, or customer demands. The fourth source is the growing demands for internationalization (Contractor, 1986; Koepfler, 1989). The way of doing business has changed (Siriram and Snaddon, 2004:779). Ohmae (1989:143) describes today's world as one of "converging consumer tastes, rapidly spreading technology, escalating fixed costs, and growing protectionism … Globalization mandates alliances, makes them absolutely essential to strategy". Furthermore, sources of uncertainty encourage cooperative behaviour between firms. Oliver (1990:243) discusses collaboration with other firms being one of the ways to reduce uncertainty and bring about firm stability.

Because of improved telecommunications and modes of transport, opportunities provided by foreign markets are far more accessible to national companies than they were in the past. "Global communications were such that the distinction between local and global was economically much sharper [in the second half of the 19th century] than it is today; the ability of firms to quickly assemble and efficiently operate complex forms of interfirm agreements was severely limited. The capacity to organize and operate complex and geographically dispersed organizational forms is now widely available: with enhanced competition, the need to select efficient structures is even more pressing" (Teece, 1990:8). Ohmae (1989:144) comments that alliances are critical to serving customers in a global environment. He mentions that customers, independent of the nationality, "receive the same information, seek the same kinds of life-styles, and desire the same kinds of products". Ohmae continues by describing the importance of partners in the global game: "To compete in the global arena, you have to incur- and somehow find a way to defray – immense fixed costs. You can't play

a variable-cost game any more. You need partners who can help you amortize your fixed costs, and with them you need to define strategies that allow you to maximize the contribution to your fixed costs".

Companies today can far easier establish a presence in a foreign country by opening up subsidiaries or branch offices and facilitating their growth into international markets. This results in their eventual change in company type from national to international. Similarly, companies can far easier source and obtain their raw materials or subcomponents from various countries, or establish manufacturing plants in foreign countries to benefit from cost effective production facilities and/or labour. In this way they globalize their operations. One of the arguments for globalization is that "local variations can easily be dealt with inside the framework of the global strategies of the multinational corporations. Indeed, globalization of R&D has already led to local adaptation and modification of products to meet national variations, as a normal and almost routine activity of TNCs (transnational companies)". (Freeman and Soete, 1997:309). Freeman and Soete (1997:311) comment that globalization is important for continuous incremental innovation, facilitating access to a supply of local managerial and technical skills, and accumulated tacit knowledge, but it is even more important for radical innovation where TNCs are well positioned to "transfer specialized equipment and skills to new locations if they so wish and to stimulate and organize the necessary learning processes. They are also in a position to make technology exchange agreements with rivals and to organize joint ventures in any part of the world".

Markets have changed from supply markets where companies are trying to keep pace with demand, to demand markets, where customers demand products offering variety, and tailor made for their specific purposes. Freeman and Soete (1997:199) describe how the supply markets had to produce urgently and specifically for the markets and cite as examples the following: following the two world wars, there was a demand in Germany to find a replacement for natural materials which spurred on the intense R&D efforts of IG Farben and other chemical firms; the military-space demand in post-war America stimulated many innovations based on Bell's scientific breakthrough in semiconductors and the early generations of computers; radar was the result of the war-time requirements by Britain; and Toyota entered the truck industry as a response to the Japanese government's request for military aims. A recent example of how the demand for a product has changed can be seen in the telephone – which until the 1960s in South Africa was only available in a couple of shapes and sizes, and all of these being offered in a standard black. Today telephones come in various shapes, sizes, colours and connectivity combinations (fixed line, wireless, Internet) and customers have, and demand, a wide range of choice.

Today's business environment is complex and dynamic: products and processes are becoming more complex, the growth rate of technological knowledge is continually increasing and firms are becoming more specialized. This is being driven largely by customers who are becoming more demanding requiring products that reduce costs, offer quality, add value and/or address an emotional need [2].

Often, because of today's business environment that is so typically characterized by rapid change, company demise is the end result. Over a 40-year period, the average lifespan of an S&P 500 company has halved, and by 2020 more than three quarters of the S&P 500 will consist of companies that are not yet in existence. Even successful companies are struggling to deliver consistent performance (Lapin, 2004:12). Further evidence of the negative impact of a rapidly changing environment is provided by Laurie (2001:3) who comments that over a 40 year period from 1955 to 1998, only eight *Fortune 50* companies sustained significant growth. These were 3M, Hewlett-Packard, American International Group, Dayton Huderson, PepsiCo, Proctor & Gamble, United Parcel Service and Wal-Mart. In many instances the decline was attributed to a failure to recognize that significant corporate growth is fuelled by a continuous flow of innovation through new product research and development. The focus was on incremental improvements that could contribute to next year's operating results, rather than technologies that might cannibalise existing offerings. Hence, company survival and growth is dependant on "doing things differently" rather than merely on "improving efficiencies". Freel (2003:752) highlights the importance of continuously innovating, citing Freeman and Soete (1997), and suggesting that " … not to innovate is to die".

"The apparent random, accidental and arbitrary character of the innovative process arises from the extreme complexity of the interfaces between advancing science, technology and a changing market" (Freeman and Soete, 1997:202). In today's competitive environment firms must differentiate themselves in order to survive. Differentiation is achieved when a company produces products and services that either focus on a niche market, offer cost advantages, or cater for variety i.e. tailor-made products to meet the customer's needs. By following one of these strategies a company can differentiate itself from the competition. Innovation is usually associated with differentiation as innovation brings about new or

[2] To clarify the need of fulfilling an emotional need, we can consider the recent new range of automobiles in the four-by-four luxury range. Although these vehicles are designed to travel on rugged and difficult terrain, the majority of these vehicles is used for travel on national, provincial and local roads and is seldom used for their features of road-holding on difficult terrain. The market for these vehicles is not necessarily to appeal to the individual requiring an "off-road" vehicle, but rather the individual who *perceives* he/she may require an off-road vehicle and hence because of the lifestyle that the vehicle portrays. The decision to purchase such a vehicle is therefore based on emotion rather than on technical competence.

improved products/processes/services and if usually associated with a different way of doing things.

It is important for companies to develop effective strategies for growth and the capabilities to execute on them efficiently in this high risk environment (Lapin, 2002:12). Innovation plays an important role in helping companies to "do things differently". Innovation is recognized as critical to the survival and sustainability of companies. "Innovation is the only insurance. If you are not writing the new rules you are slowly becoming irrelevant" (Hamel, 2004:1). Hamel further comments that "companies that miss a key trend may never catch up". He believes that company survival is dependent on "innovative strategic business models that keep pace with the accelerating change around them" Hamel (2004:4).

Having examined the importance of innovation to companies, and understanding that it is companies comprising industries that make countries competitive (Porter, 1998), understanding the importance of innovation to countries merits some discussion. The innovativeness of companies has a knock-on effect in the environment in which they operate, and this ultimately affects the country(s) from which they operate. In the context of globalization, we shall therefore consider the importance of countries being innovative.

1.3 The need for countries to innovate

"Innovation" is a term that is often used in the context of economic development and growth. As was discussed in the previous section, a change in environmental drivers affecting business development must be taken into account when considering why companies need to innovate. This change in the environment does not only affect companies, but also countries. As we shall see below, a country's competitiveness is closely linked to that of its industries.

Pistorius (1998:2-1) discusses how the world order has moved from a focus on military and security concerns, to economic concerns and an emerging "global economic war". Support for this can be illustrated by an excerpt from a report by the US Department of Commerce (1996): "a new battlefield has emerged in the form of a global marketplace, and able competitors from around the world are fighting for a share". In South Africa, economic growth and development are national strategies, where economic decline, poverty and associated social problems are national threats. Economic security, Pistorius believes, will become an increasingly important component of national security and a

critical path to achieving economic security will be to become globally competitive. Porter (1998) believes that a nation's competitiveness is dependant on the capacity of its industries to innovate. Wealth, he believes, is governed by productivity. To achieve competitive success, firms must have a competitive advantage in the form of either lower costs, or differentiated products that command premium prices. Porter focused his research on industries where complex technology and highly skilled human resources offer the potential for high levels of productivity as well as sustained productivity growth (Porter 1998:10). From the above, there appears to be a golden thread linking innovation, competitiveness and economic wealth of nations.

In South Africa this golden thread has also been recognized. The focus on innovation and improving the competitiveness of South Africa leading to economic wealth is emphasized by the comments by President Thabo Mbeki in describing the context for South Africa's National Research and Development Strategy of 2002 "… we have to devote the necessary resources to scientific and technological research and development … we must further encourage innovation among our people and ensure that we introduce new developments into our productive activities. … While ensuring that we continue to develop a balanced economy, we must also identify and develop the lead sectors that will help us further to expand the base for creation of wealth and give us the possibility to compete successfully within the dynamic world economy." (South Africa's National R&D Strategy: 2002:3). We now move on to discussing what are technological innovation and its role in driving economic growth.

Technical innovation is defined by economists as "the first commercial application or production of a new process or product" (Freeman and Soete, 1997:201). According to Pistorius, (1998:3-4) technological innovation is defined as the "creation of new products, processes, services, techniques and the acceptance in the market" (Pistorius, 1998:3-4). Pistorius, (1998:3-4, citing Roberts, 1988:12) elaborates: "invention + market exploitation = innovation". In clarifying the difference between invention and innovation, Pistorius (1998: 3-5) explains that whereas inventions create new knowledge, innovations create new wealth; and whereas the criterion of success of an invention is a technical one, the criterion for success of an innovation is an economic one. Pistorius refers to the work of Sahal (1977) that explores the mechanisms for diffusion of a technology, building on this as follows: "an invention is essentially the creation of a new device. An innovation additionally entails commercial or practical application of the new device … first application of an invention." Technological innovation, concludes Pistorius (1998:3-6) encompasses idea generation, development, manufacturing and diffusion into the market.

Having defined technological innovation we shall discuss its role in promoting economic growth.

Pistorius (1998:2-5) comments that "economists generally attribute the greater part of measured growth to technological progress rather than to increases in the traditional input of labour and capital". He cites Freeman (1986) "macro-studies of technical progress…almost invariably find technical progress as the prime determinant of the rate of growth" and Porter (1998) "an upgrading economy demands a steadily rising level of technology … technological change, in the broadest sense of the term, accounts for much of economic growth." However, it is not only technology, but technological innovation that puts a country on the path to being globally competitive: "the changing character of technology and specifically, technological innovation has become the strongest engine driving society…" (Kash, 1989:7). "To be internationally competitive technologically a country needs a heavy enough concentration of high technology sectors, employees and the appropriate infrastructure in one or two regions to generate the spill-over effects from research and other advantages of agglomeration on a scale sufficient to generate benefits for the national economy" (Sternberg and Tamasy, 1999:386).

It is clear innovation is important for economic wealth both at a microeconomic level, as well as a macroeconomic level. Countries and companies need to understand and manage innovation to be competitive. Innovation does not happen in isolation but it requires networks and inter-firm collaboration. Such linkages happen in the context of a knowledge economy. An explanation of "the knowledge economy" and its characteristics follows in the next section.

1.4 Technological innovation in context: knowledge management in the knowledge economy and inter-organizational collaboration

1.4.1 The knowledge economy

As discussed above the business environment of the 2000's is dynamic and ever changing. Companies therefore need to be flexible and adaptable to cope with this environment. Those that succeed do so by innovating and differentiating themselves from their competitors. Innovation requires companies to apply knowledge and to manage knowledge and technology appropriately. This is usually done in collaboration with other

partners as no one firm has all the knowledge required to bring about the desired level of innovation. In summary, in order to cater for variety, more knowledge is required. This knowledge needs to be managed within some organizational form. What follows below is a discussion on knowledge management and the associated organizational forms within which this knowledge is managed.

For the purposes of this research we understand the knowledge economy as being where the main production factor of the economy is knowledge. Within this knowledge economy knowledge needs to be managed. Toffler (1981) describes a third wave of technology that will change the way that firms function. He believes that information, technology and knowledge form the pillars of the third wave. The source of power of this third wave will arise from ideas, information and knowledge, where the pace of change is driven by knowledge and application of ideas.

Scarbrough et al (1999:2) define knowledge management as "any process or practice of creating, acquiring, capturing, sharing and using knowledge, wherever it resides, to enhance learning and performance in organizations". Siriram and Snaddon (2004:784) describe knowledge management as encompassing the areas of information flow, knowledge transfer and the integration of new and emerging technologies.[3] They use the logic that the subsets of knowledge management should lead to improved communication within and between companies. Improved communication should result in managers having relevant information timely to make necessary decisions quickly. Quick decision making concerning market threats and opportunities, i.e. being responsive to a competitive environment, may give a company a competitive advantage. They cite Hamel et al (1996:595) who stated that "knowledge transfer depends on how easily knowledge can be transported, interpreted and absorbed" Siriram and Snaddon (2004:785).

Knowledge can be defined as both tacit (tangible) and explicit (intangible). Explicit knowledge can further be defined as easily communicated, articulable knowledge – the opposite of tacit knowledge. Siriram and Snaddon (2004:785) cite the following authors in defining tacit knowledge: "the implicit and non-codifiable accumulation of skills that results from learning by doing" (Reed and DeFillipini, 1990:89); "knowledge, which can easily be communicated and shared, is highly personal, deeply rooted in action and in an individual's involvement within a specific context" (Simonin, 1999:598, citing Nonaka, 1994). Siriram and Snaddon (2004:785) believe that specialized knowledge (that

[3] Author's comment: The management function is mainly that of facilitation, i.e. planning, leading, organizing and controlling. Hence the definitions by Scarbrough et al and Siriram and Snaddon of knowledge management should be seen in terms of the facilitation of the described processes.

acquired from being in an industry), which may include detailed steps of production, as well as specialized skills, are mainly acquired through learning by doing. They believe that tacit knowledge may improve a company's capabilities.

Hamel (2000:13) believes that organizational learning and knowledge management are closely associated with continuous improvement – "they are more about getting better than getting different." Siriram and Snaddon (2004:787) comment that organizational learning is dependent on knowledge management. Organizational learning considers the absorption of knowledge from outside the firm and diffusing this knowledge within the firm. They comment that information flow, knowledge transfer and new and emerging technologies may assist a company in learning and developing capabilities faster than their competitors. Absorptive capacity (a company's ability to learn), also plays a role.

In considering *learning*, Lane and Lubatkin (1998:462) categorize three different types:

- "Passive learning occurs when firms acquire observable knowledge about technical and managerial processes through journals, seminars and consultants."
- Active learning includes benchmarking and competitor analysis, which provide a broader view of other firm's capabilities
- Interactive learning is where a student firm gets close to the teacher firm and learns from face-to-face interaction.

To conclude, therefore, knowledge can be viewed as a critical resource for innovation, and hence for technology innovative companies. The absorption of this knowledge, or the learning that transpires, would demonstrate the existence of a competence in a firm.

Having considered the knowledge economy, we shall discuss the organizational form that promotes organizational learning, and the related motivations for these organizational forms.

1.4.2 Reasons for networks and inter-organizational relationships

Since the 1980s, globalization has been driving multinational enterprises to engage in strategic technology alliances at an unprecedented pace (Narula and Sadowski, 2002:600). These alliances often include linkages with competitors. New forms of inter-firm cooperation, particularly with respect to innovative activities where the risks and costs are very high, have been particularly important. This section spells out the reasons for firms to engage in inter-organizational relationships and networks.

Narula and Sadowski (2002:601) suggest that most cooperative agreements have two possible motivations: a cost economising motivation, whereby at least one firm within the relationship enters with a view of minimising its net costs; and a strategic motivation – aimed at long-term profit optimisation by trying to enhance the value of the firm's assets.

An alliance is defined as "any voluntarily initiated cooperative agreement between firms that involves exchange, sharing, or co-development, and it can include contributions by partners of capital, technology, or firm-specific assets (Gulati and Singh, 1998:781, Parkhe 1993, Harrigan, 1986). Strategic alliances take the form of OEM contracts, joint R&D and technology licensing agreements, joint sales, support, services and marketing deals, or a combination of these.

The decision to enter a relationship with another organization is usually based on multiple contingencies. For example, in attempting to achieve environmental stability, attempts may be made to control the relationship, or, alternatively, suppression of power in the hope that equity, reciprocity and harmony will facilitate stability. Oliver alludes to a research gap that exists in terms of how the contingencies interact to explain why organizations choose to enter relationships with one another (Oliver, 1990:260). These contingencies are (Oliver, 1990:243):

- Necessity – to meet necessary legal or regulatory requirements, and need for resources
- Asymmetry – the potential to exercise power or control over another organization and/or its resources. Oliver cites literature proposing that resource scarcity may either motivate organizations to cooperate with each other, or alternatively, prompt organizations to exert power, influence, or control over organizations that possess the required scarce resources.
- Reciprocity – which emphasises cooperation, collaboration and coordination, rather than domination, power and control, for the purpose of pursuing common or mutually beneficial goals or interest. The anticipated benefits far exceed the disadvantages.
- Efficiency – the anticipation of increases in return on assets or reductions in unit costs, waste, or downtime.
- Stability – prompted by uncertainty, organizations try to manage relationships to achieve stability, predictability and dependability in their relations with others.
- Legitimacy – justification of their activities or outputs and appearing to comply with the prevailing norms, rules, beliefs, or expectations of external constituents.

"Strategic alliances help technology companies to improve product lines, access new technologies, source manufacturing capacity and extend their market reach while containing the risks of expansion and their investments into infrastructure and R&D" (Harris, 2005:59). Hagedoorn and Sadowski (1999:89) comment that strategic alliances can be used to scan the environment wherein companies operate, looking for new opportunities. They allow companies to maintain an arm's length from new product markets, monitoring these markets before deciding on whether to enter them. Strategic alliances also provide a mechanism for sharing the risk and uncertainty, and costs, associated with R&D projects. Moore (1995:164) believes that companies should question their motives for a partnership. Of the typical motivations: a single revenue opportunity; a potential revenue stream; to capture market leadership, he believes that the only strategic objective worth pursuing is market leadership. Moore (1995:163) highlights that companies controlling the customer relationship are those with the greatest leverage.

Hagedoorn (1993:372) discusses a motive for strategic (technology) alliances being "the sharing and further advancement of research and the restricted diffusion of some basic scientific and/or technological knowledge amongst participating companies". Large and diversified firms may lack some competence in a number of scientific and technological fields, and by cooperating with other companies and obtaining the necessary complementary technology inputs, the large companies can capitalize on economies of scope through these joint efforts. Companies need to monitor the evolution of technologies, continuously assessing potential technological synergies, near-future results of general scientific knowledge and relevant complementarities of technologies. This is necessary as no company will have an all-embracing competence in every field of technology, and hence an evaluation of possible synergies with another company which may warrant a joint undertaking, is important. Alliance formation may be driven by the need to access technological advantages – especially for intangible technologies. "In such cases firms form networks with other firms" (Siriram and Snaddon, 2004:787).

Partnering with other vendors is seen as an attractive alternative to mergers and acquisitions because the partnerships carry less risk and allow the partners flexibility in terms of strategic change if necessary. Kevin Hurwitz, managing director of AMVia is quoted as saying "Customers are looking for one-stop shops, and as a result, we're seeing our suppliers enter into more and more partnerships. Since there is no one supplier that can do everything, alliances are going to become more and more important". The demand by customers for integrated solutions and interoperability between products is driving vendors to form strategic alliances (Harris, 2005). The growing multi-disciplinary

nature of technological innovation, as well as the need to specialize because of the fast technological development, cause knowledge based entrepreneurial activities often to be carried out in networks of large and small firms, universities and other knowledge institutes (Groen (2002), citing the work of Groen et al (2002), Rip and Groen (2001), and Huff (2000)).

Freel (2003) refers to the dominant network theory of innovation that holds that individual firms are seldom capable of innovating independently, and never innovate in a vacuum. Companies, including leading companies, in industries where technology provides the competitive advantage, can no longer rely solely on their own resources to meet all the costs and develop the many different capabilities required for a totally independent strategy (Nardeosingh (2000:12) citing the work of Dussage and Garrette, Lam, 1996:973; Oerlemans et al, 2001). Ohmae (1989:145) comments that the many different critical technologies comprising today's products are driving company alliance formation. Klein Woolthuis and Groen (2000:158) examined collaboration in the hi-tech industry and concluded that, because of their highly uncertain and complex character, technological competences and personal relationships were critically important in hi-tech partnerships. They referred to the work of Boer and During (1999) which explained that the innovation process is characterised by uncertainty (unpredictability), complexity (comprehensibility or analysability), diversity (the variety of work), and interdependence (dependence on another). Because most companies do not have all the required expertise for innovation, they are forced to cooperate with complementary specialists.

"Networks are seen as a central determinant in the industrial creation of novelty, and are therefore a decisive co-ordination mechanism. In networks new technological opportunities are created via technological complementarities and synergies by bringing together different technological and economic competencies" (Pyka, 2002:153). Partnering where this will result in expanding the company's resource base is therefore a logical strategy to ensure survival and growth in a dynamic environment.

Linder et al (2003) found that leading companies approach innovation strategically. Rather than choosing partners in an ad hoc manner, or on a case-by-case basis, they create innovation channels appropriate to their needs that lead to long-term, well-managed relationships. Advocacy by the company's management in terms of creating a culture that accepted external innovation contributions was viewed as an important component. (What was missing in the companies surveyed by Linder et al (2003) was critical information about where and how, or even if - externally sourced innovation was paying off. Hence, although

there is recognition that external capabilities are necessary for innovation, the benefits of this do not appear to have been quantified.)

Freel (2003:767) cites recent literature that states that "the economic network approach overstates the role of external factors in the innovation process." He concludes by commenting that "one is tempted to accept Oerlemans et al (1998:308) contention that, in most instances, "…innovation is primarily a process built on internal capabilities", which may, more occasionally, be complemented by external agency." "To be successful, innovating organizations must form linkages, upstream and downstream, lateral and horizontal. Advanced technological systems do not and cannot get created in splendid isolation" (Teece, 1990:22). This allows them to innovate successfully despite internal resource limitations (Oerlemans et al., 2001).

The importance of networks has been recognized in recent years because of their presumed importance for learning and innovation. "Networks are thought to encourage interactive learning between participating organizations through the sharing of knowledge and information, which is itself facilitated through trust, shared values and ways of working. Ultimately, the aim is the development of new products and processes, but it may also include the exploitation of new technology, the introduction of new skills, and/or the development of new markets (Tracey and Clark, 2003:4). Nardeosingh comments (2000:12) that "whenever a technological innovation requires specific and highly sophisticated knowledge that one single firm cannot afford, there will be a tendency to form networks".

Tracey and Clark (2003:4), citing Hotz-Hart (2003:434) summarize the potential benefits of networks of interaction as offering:

- *Better access to information, knowledge, skills and experience*. In particular, networks provide opportunities for learning about new ways of operating and about new forms of technology, and can reduce the development time and cost of new products and production processes.
- *Improved linkages and cooperation between network members*, particularly between users and suppliers….Effective networks can encourage interactive learning, synergy and complementarity between key specialist groups across participating firms, such as design, production, marketing and finance.
- *Improved response capacity.* Networks allow participating firms to respond more quickly and to anticipate changing competitive circumstances, and to learn about new forms of technology

- *Reduced risk, moral hazards, information and transaction costs.* Networks of firms with complementary assets allow resources to be shared and reduce costs. Risks can also be assessed and shared throughout the network leading to more informed decisions and further costs reductions.
- *Improved trust and social cohesion.* Alliances encourage shared values, goals, norms, and ways of working which facilitate problem-solving, collective action and innovative behaviour, often through a complex combination of competition and cooperation.

Competition is increasingly becoming knowledge-based as companies endeavour to learn and develop capabilities faster than their competitors (Lane and Lubatkin, 1998, Prahalad and Hamel, 1990). Oerlemans et al (2003:18) in citing Hakansson (1993) discuss the importance of knowledge and learning and resource mobilisation, clarifying that in transforming resources, knowledge about their uses is important, and learning is a way to accomplish this. They elaborate that knowledge can be acquired either internally, or externally. Internal learning occurs through R&D or "learning by doing", and external learning can be achieved by interacting with other firms: firms making use of other economic actors. Oerlemans et al (2003) concluded from their research findings that the use of internal *and* external resource bases resulted in a better innovative performance of firms, hence stressing the importance of including network variables in analysing innovation.

Dierickx and Cool (1989:1509) believe that the sustainability of a firm's asset position is dependent on how easily its assets can be replicated. If the assets cannot be bought in factor markets, competitors may either try to imitate them by accumulating similar asset stocks of their own, or they may try to substitute them with other assets. It is in responding to problems that companies do not always have sufficient time to develop the knowledge and capabilities to respond effectively (Lane and Lubatkin, 1998, citing Dierickx and Cool, 1989). This has resulted in a shift from the more traditional resource or risk-sharing alliances to alliances offering learning from partners (Hamel, 1991). By forming "learning alliances" companies can speed up their learning by acquiring and exploiting the knowledge developed by others, hereby developing new capabilities to minimize their exposure to technological uncertainties (Lane and Lubatkin citing Grant and Baden-Fuller, 1995). "The importance of learning alliances to capability development places a premium on a firm's ability to identify, assimilate, and utilize a partner's knowledge (Lane and Lubatkin, 1998: 461).

Hagedoorn (1993:373) comments that during collaboration, one or more of the partners can have as an objective the secret acquisition of some of the capabilities, knowledge or technologies of the partners. The hidden agenda therefore is to quickly absorb some innovative capabilities from the other partner(s). A more transparent approach is that of an agreed technology transfer arrangement where one or all partners will benefit by leap-frogging their competitors because of the technology that is transferred.

An example of a strategy to capture organizational learning is as follows. In explaining the reasons for companies to *invest in the next great business* (where companies choose to invest in ideas that aren't their own (Laurie 2001:67), Laurie cites Intel which employs PhD's rather than MBA's, and whose function it is to move in alongside selected entrepreneurial optical-network companies, and assist them with manufacturing know-how. "We are using our investments to gain organizational learning and to understand where the opportunities are and where we can add value. Now we're starting to position some senior people to capitalize on these opportunities" (Laurie, 2001:77).

As discussed, companies must form relationships with other companies to improve knowledge management and organizational learning. Furthermore, relationship management, which may be formed through social networks and embedded ties, and supported by supplier closeness, communications, trust and goodwill, and risk, may increase awareness of the competitive environment. "Therefore, firms should form networks with other firms in order to leverage advantages in terms of supplier closeness, communications, trust and goodwill. Social networks and embedded ties may reduce risk associated with network structures (Siriam and Snaddon, 2004: 789). Siriam and Snaddon (2004) conclude that relationship management links to knowledge management, which in turn leads to opportunities in the competitive environment. Furthermore, the impact of competitive advantages is in the linking of technology management (technologies, technological resource skills and firm's competencies), transaction processes, and governance structures (technological sourcing, knowledge management, organizational learning and relationship management).

Pyka (2002:153) discusses two approaches for explaining networks, viz: incentive based and knowledge based. In examining the history of industrial organization, he cites Williamson (1975) for introducing a theoretical explanation in terms of transaction costs. "Transaction costs comprise costs of search and evaluation, costs of setting up governance prior to transactions and costs of control and redesign of the relation" (Nooteboom, 1996:986). Williamson (1985) concluded later that "firms are assumed to

engage in co-operative relationships in order to minimise their transaction costs" (Pyka, 2002:154). Pyka (2002:154) comment that where well-defined property rights exist and where technology is quite stable, is a situation here markets are most efficient in co-ordinating the transactions and become close to perfect competition. At the other extreme where there is technological uncertainty and weak intellectual property rights, hierarchically structured organizations, i.e. firms appear to be well suited. This is because in a firm "the creation and transfer of know-how takes place within the organisation and are therefore perfectly internalised and appropriated. However, there are many in-between cases which offer the possibilities of innovation networks to emerge and, the real existence of this kind of network points to the fact that specific forms of inter-organisational linkages are also well-suited for innovation processes and the respective transactions" (Pyka, 2002:154). This is supported by Hagedoorn and Schakenraad (1992) who identified innovation networks as a common organizational form in the knowledge intensive sectors where high uncertainty and low appropriability prevailed.

In moving from an incentive-based to a knowledge-based approach for explaining networks, Pyka (2002:157) considers a change in innovation processes which has occurred with time. Citing Dosi (1988) he explains that "innovation processes mutate from optimal cost-benefit considerations to collective experimental and problem solving processes". Because the knowledge base of a firm is no longer perfect, a gap develops between the competencies of the firm and the difficulties that need to be mastered. Two reasons are responsible for this gap, namely: "on the one hand technological uncertainty introduces errors and surprises in firm behaviour. On the other hand, the very nature of technological knowledge avoids an unrestricted access. Knowledge in general, and new technological know-how in particular, are no longer considered as freely available, but as local (technology specific), tacit (firm specific), and complex (based on a variety of technology and scientific fields). To understand and use the respective know-how specific competencies are necessary, which have to be built up in a cumulative process in the course of time" (Pyka, 2002:157).

Pyka (2002:158) mentions that improvements in one technology may create very different applications in other technologies, or even completely new technological opportunities. Because of the increased complexity of modern innovation processes a firm must master many different knowledge fields. This requirement for providing for an additional broad knowledge base in addition to their specific competencies, drives firms to increase their absorptive capacity (Cohen and Levinthal, 1989) enabling them to react flexibly on external developments and external knowledge. Networks enable the pooling of different

competencies and enhance the process of resource creation by exploiting complementary effects. Pyka (2002:158) explains that technological knowledge cannot be exchanged via markets, even if the right incentives exist. A common knowledge-base and shared experience is necessary for a simple know-how transfer. Pyka (2002:159) summarized by commenting that "within the knowledge-based approach innovation networks thus are considered to have here major implications: first, they are seen as an important co-ordination device enabling and supporting inter-firm learning by accelerating and supporting the diffusion of new technological know-how. Second, within innovation networks the exploitation of complementarities becomes possible, which is a crucial prerequisite to master modern technological solutions characterised by complexity and a multitude of involved knowledge fields. Third, innovation networks constitute an organisational setting which opens the possibility of the exploration of synergies by the amalgamation of different technological competencies. By this, innovation processes are fed with new extensive technological opportunities, which otherwise would not exist, or whose existence would at least be delayed."

Narula and Sadowski (2002:602) refer to work done by Freeman and Hagedoorn (1994) confirming that most of the strategic technology alliance activity in the 1980s was primarily by firms from North America, Europe and Japan. Developing countries contributed marginally to strategic alliance formation – less than 5% during the period 1980-1989. This, they believed, suggested that the majority of developing countries were increasingly lagging behind, and specifically in the new and emerging technological sectors. However, Narula and Sadowski (2002:611) believe that a good opportunity exists for strategic technology partnering for developing countries, viz to partner with industrialized countries and both advance and modify a product, developed in a developing country environment for developed country market conditions and requirements. From the industrialized country perspective, this represents a low-cost technology development option.

Having discussed the need for inter-organizational relationships and strategic relationships, the different forms and associated benefits of these forms, and specifically as options for SME-LCO partnerships, will be discussed next.

1.5 Forms of partnerships between LCOs and SMEs

O'Dwyer and O'Flynn (2005), citing Contractor and Ra (2002), Kogut (1988), Mowery et al (1996) and Oxley (1997), found that the type of governance structure was determined by the nature of the knowledge to be exchanged. They therefore hypothesised that "the

more capable the knowledge receiving partner, the less help they would need to absorb the knowledge imparted. This would lead to the choice of a governance mode requiring less hierarchical control (e.g. contracts). Conversely they argue that if the absorptive capacity of the knowledge recipient is lower, a governance mode requiring more interaction with the knowledge supplier is needed (e.g. and equity joint venture)" (O'Dwyer and O'Flynn, 2005:4). Three inter-related issues affect the choice of alliance governance mode, namely: "the absorptive capacity of the knowledge recipient; the appropriation concerns of the knowledge supplier; and the type of knowledge being exchanged" (O'Dwyer and O'Flynn, 2005:4).

Slowinski et al (1996:42) comment that traditional strategies for growth and diversification focused on mergers and acquisitions. These were later supplemented by a variety of joint-venture arrangements, leveraged investments, licensing and royalty agreements, and others. Hayhow and Ressler, (1996:280) list some of the most common forms of partnership as follows:

- **Joint ventures** "The most common and classical way large companies are willing to deal with small companies. Joint ventures are a viable option in the current economy, in which it is difficult to raise equity capital. They make a good marriage if both parties understand the strengths of the other. For the small company, these strengths are typically in creativity and innovation; for the large company, strength lies in having in place manufacturing, marketing and distribution systems
- **Equity participation** …The large company gets stock and future value in exchange for providing operating capital that will allow the small company to expand its business
- **Licensing deals** Small firms should look at licensing deals cautiously, even though they often are the first deals offered by a large firm. Licensing agreements have two major drawbacks: first, they return less income to the small company than a joint venture or other arrangements would because with a licensing deal, the small firm gets only a royalty; second, they do not give the small firm much, if any, control in the decision-making process
- **Subcontractor relationships** Becoming a subcontractor to a major corporation can be an especially effective way for a small company to enter the large industrial market"

Joint ventures can be used to assess the value of a new technology, product, or the capabilities of a partner, and depending on greater clarity being obtained on the future success, the option to acquire is likely to be exercised (Kogut, 1991). Joint ventures

provide an opportunity for developing a roadmap for joint value creation, which is key to a successful long-term cooperation (Büchel, 2001).

An alternative to partnering is licensing the small firm's technology. However, the disadvantage of licensing is that it prevents involvement by the large company in the direction of the development or in which technical elements need to be emphasized. Furthermore, transferring the technology from the small firm to the large firm is a difficult process. By involving the large firm in all phases of research, partnering helps overcome these obstacles (Slowinski et al, 1996:43).

Mowery et al. (1996) propose that inter-firm knowledge transfers should be limited in unilateral contract-based alliances such as licensing agreements and that such agreements should create fewer opportunities for inter-firm knowledge transfer. Equity joint ventures, on the other hand, appeared to be effective for transferring complex capabilities. Oxley (1997) found that equity joint venture outperformed alternatives in supporting inter-firm learning.

From a LCO perspective, outsourcing to an SME is an attractive option. Kimzey and Kurokawa (2002:36) in support of outsourcing as an option by LCOs list the following responses they received from large corporates in reply to the question: why outsource technology?:

- "To make the bottom line look better
- Because no one can do everything
- It is the only way to break up an inefficient bureaucracy
- The great equalizer enabling the firm to leverage new-product development resources
- To be the technology leader but not the technology driver
- Reduced R&D budgets"

Candalino and Knowlton (1994:26) comment that for outsourcing to be effective, a type of partnership was required in which a clear understanding of how the customer defines value is essential for value to be delivered. Small firms sell their company based not only on the services they can provide, but also on the alliances they can engineer. Large companies creatively look at new alliances and hence this is an attractive option for them.

Referring to Pedersen and McCormick (1996), Kesper (2002:3) mentions that whereas in South Korea where large firms function as catalysts of growth to their subcontractors, in Africa corporate subcontracting to SMEs (and mostly "informal" firms), is usually to reduce costs by exploiting labour-surplus conditions and circumventing regulations and trade union organisations.

The last 10 years has seen strategic alliances coming to the fore (Slowinski, 1996:42). A strategic alliance is an attractive option where an LCO has identified a significant opportunity in one of its existing markets and has most of the capacity to address the opportunity but lacks the technology. By forming a partnership with a world class SME the LCO hopes to speed up entry into the emerging market hence gaining a competitive advantage (Slowinski et al, 1996:42). Laurie (2001:127) believes that large companies can adopt one of the following venturing strategies to acquire new innovation:

1. Invent the next great business
2. Invest in the next great business
3. Venture the next great business
4. Partner the next great business
5. Acquire and integrate the next great business

Hence, it is apparent that SMEs are important for innovation and job creation, and governments of today are increasingly recognizing them for their important role in economic growth. However, because of their lack of access to sufficient resources, they have a high failure rate. Gaining access to such resources via, for example, a partnership arrangement with a large company becomes an important focus for a growing SME. Similarly, there are many reasons for an LCO to partner with an SME, including accessing new technologies.

However, partnerships do not only have a positive side – many partnerships end in failure. The next section will consider some of the reasons for partnership failure.

1.6 Partnership failure

Cooperative ventures are difficult to manage and have a high failure rate. The difficulties associated with cooperative ventures are even greater where technology transfer and knowledge sharing is involved – for example joint R&D and product development (Lam, 1997:974). The difficulties are often attributed to problems of control, risk and competitive

tension and governance structures that promote stability, trust and boundary permeability between the partners have been suggested. Citing Morgan, (1997), Tracey and Clark (2003:8) comment that the functioning of networks may be constrained by political factors. "Networks (and their constituent organizations) contain a number of individuals, interest groups and coalitions that often come into conflict with one another and whose ambitions may or may not coincide with the "best" interests of the network as a whole. Conflict may manifest itself through the manipulation of information, through hostility and a lack of trust between participating organizations (or individuals and groups within them), and through an unwillingness to cooperate with partners. This may be exacerbated by specialization and departmentalization within and between firms that create sub-units with separate goals and tasks. Often, these sub-units develop their own commitments and outlooks based on values, attitudes, and beliefs that are self-reinforcing. The decision-making process thus involves negotiation or bargaining between interest groups with different levels of influence … it could be argued that power differentials within networks of firms can facilitate decision-making and help to resolve disputes. However, more extreme power differentials within networks may lead to expediency and unscrupulous behaviour (Bathelt 2002:589, Granovetter, 1985)".

The odds of failure are great in the technology business, in which the obstacles are very large due to the industry's rapid pace of change and need for constant innovation (Stein, 2002:59). Park and Russo (1996:877) citing Coopers and Lybrand, 1986, Kogut, 1989, Porter 1987, claim seven out of ten joint ventures and other strategic alliances fail. Frick and Torres (2002:1) refer to studies which confirm that in at least 50% of the cases, mergers and acquisitions (M&As), spin-offs, and alliances have destroyed value for the acquiring company. However, they go on to say that in spite of this, those companies which are most successful in the high-technology industry are also those which are active deal makers. Their research established that whilst the average merger or acquisition destroyed value for the acquirer, those companies which undertook such activity strategically added value to their companies. Moore (1999:126) claims that strategic alliances usually fail, whereas tactical alliances, which focus on delivering a "whole" product, i.e. a total solution for the customer's problem (which could include service offerings, etc.) usually succeed.

A 2001 study done by Accenture indicated that only 20% of corporate alliances in the IT industry succeed, 30% fail, and the remaining 50% remain in a state of underperformance. Among the reasons given for failure were cultural issues, failure to deliver on what was expected by one or both of the parties, or a change in strategic priorities (Harris, 2005:63). Büchel (2001) lists unclear expectations, hidden agendas and

lack of management support as some of the reasons for surprises, and failure, of joint ventures. She comments on recent studies stating that 25% - 50% of joint ventures fail within six years.

A relatively high rate of failure of alliances is attributed to a lack of cooperation and the opportunistic behaviour of partners (Das et al. 1998:491). Referring to the work of Hamel (1991) and Hennart & Reddy (1997), Das et al (1998:998) comment that "partners often use JVs as a cover to learn the other firms' know-how". Furthermore, alliances are often used as a cover by partnering firms for appropriating firm-specific resources (Das et al (1998) referring to the work of Inkpen and Beamish, (1997)). Parker (2000) cites Hamel et al (1989) in referring to the following risks when collaborating in product development: "leakage of a firm's skills, experience, and knowledge that may form the basis of its competitiveness; the danger that its partners not only acquire the competencies that the firm brings to the product development, but also gain access to the knowledge and skills that the firm uses in other business areas". Although the reason for collaboration is often to reduce product development time and cost, the negative aspects included financial and time costs relating to the management of the collaboration that may offset any gain (Farr and Fischer, 1992); and the loss of direct control over the product development process (Ohmae, 1989). Parker's findings (2000) were that frustration where the other party became less committed or changed his priorities, was the greatest negative aspect of collaboration. Furthermore, there was a fine line between leaking too much proprietary company information and not supplying sufficient information for collaborative product development to be successful.

Joint ventures (jv's) are designed to meet the objectives of both the participating companies and of the collaborative partnership, and will be determined as successful if the value of the outcomes exceeds the opportunity costs incurred by the partners, and where there has been a fair distribution of both the outcomes and the costs (Park and Russo, 1996:878 citing Jarillo 1988). However, should "this system of balanced and equitable contributions, benefits, and safeguards" be jeopardized, then so is the JV itself (Park and Russo, 1996:878 citing Porter and Fuller, 1985). There may then be more incentives to cheat and act opportunistically to achieve their own competitive goals rather than those of the partnership (Park and Russo 1996:878).

According to Peter Killing (2001), "entering an alliance with a competitor is a risky and difficult proposition. The risk, of course, is that your ally of today may again be your outright competitor tomorrow – now strengthened with knowledge of your technology, your

markets, and your way of operating. But refusing to enter into an alliance with a competitor … carries its own risks. Will (the company) be big enough to survive?"). Park and Russo (1996:887) comment that cooperating with competitors is especially risky. "Protecting key specific know-how from one's competitors is difficult indeed, as the incentives to act opportunistically appear to motivate actions that threaten and frequently undermine joint ventures with them. We would posit that these incentives are intensified by the abilities to competitors to recognize and appropriate key technologies and know-how under these conditions." In a JV relationship the partner can identify, appreciate and assimilate the know-how (Cohen and Levinthal, 1990).

The negatives associated with strategic alliances in the IT industry include:

- alliances are a risky proposition with a high rate of failure
- companies may become overly dependent on their alliance partners, which may pose a problem if the relationship or the business performance of one of the partners deteriorates
- surrendering a certain amount of control to business partners
- flexibility to pursue other partnerships and acquisitions may be limited
- problems may arise when partners' goals or vision starts to diverge
- many alliances become a drain of human and financial resources rather than contributing to the bottom line (Harris, 2005:62).

In considering the evolution of strategic alliances, Slowinski et al (1996:43) describe that in the past when a large company wished to enter a new product line quickly or wished to rapidly acquire a new technology, it would do so by acquiring the small company that had developed it. Often the owners of the small company would become "rich" employees of the large company. However, with time the former entrepreneurs would become frustrated with the bureaucracy of the large company and would leave. This resulted in the objectives of the acquisition not being realized, mainly because "the entrepreneurial spirit and incentives of the small company were incompatible with the culture of the large firm". The end effect was that the innovation incentive for the SME had, in fact, been killed. Alliances between SMEs and LCOs therefore became a more attractive option Radtke (1997:95). Da Silva (1995) refers to literature wherein assumptions are that small firms are more innovative in process and product development; they generate a greater number of jobs at a lower cost; they are more flexible and able to adjust rapidly to shifts in product demand; they are more price competitive due to lower overhead costs. However,

she comments that these assumptions have not gone unchallenged and work has been published questioning some of these assumptions, e.g., small firms do not have significant innovative capacity due to a number of constraints e.g. a lack of technical and financial resources, limited personnel and access to information. Because of these constraints, small firms "survive by means of self-exploitation, low wages, bad working conditions, and the suppression of trade unions and workers' rights" (Da Silva, 1995:46).

Too often partnerships between large companies and SMEs fail and such partnerships present a particular set of management issues. Minshall et al (2005) comment that often the larger, established firm is able to appropriate most of the value from the relationship and the general performance of the start-up may be adversely affected. Furthermore, although the resources or competences of the LCO (from the start-up's perspective) formed the basis for the partnership and were crucial for the success of the partnership, this enthusiasm may not be reciprocated by the individuals within the LCO. The reasons for this apparent lack of enthusiasm could result from a lack of entrepreneurial attitude, or the collaborative project has little effect on the growth strategy of the LCO. (Minshall et al, 2005). Moore (1999:125) comments that partnerships between large companies, with established distribution channels but an ageing product line, and SMEs with an innovative technology, seldom work. This is mainly because of the divergent cultures, and the decision cycles which are typically out of sync with each other. Tracey and Clark (2003:11) citing Moss Kanter and Corn (1994:6) commented that cultural heterogeneity was overstated as it was an easy explanation for explaining tensions whose actual causes were much more deep-rooted. They referred to Europe where ties between firms are increasingly taking on an international flavour because firms in small jurisdictions seek appropriate partners that can improve their competitive position, regardless of their geography. Such firms are increasingly overcoming the barriers of culture and distance.

The fear of acquisition of the SME by the LCO is a very real fear. An alliance between a very small and large partner is unlikely to be successful long term as the smaller one may be acquired by the larger one (Klofsten and Schaerberg, 2000:142) referring to the work of Faulkner (1995)). They cite the work of Doz (1988) confirming that hidden agendas are "commonplace in technological partnerships". There was evidence in the research he conducted to support the fear expressed by the small companies that co-operation with a larger partner was the first step towards being acquired.

Porter (2003:14) cautions that alliances should only be used on a very selective basis – and as part of a transitional strategy rather than a permanent solution. These alliances should not block the company's ability to gain competitive advantage.

The following table summarizes the most important reasons as discussed above for partnership failure between and SME and an LCO:

Table 1: Reasons for partnership failure between an SME and an LCO

Founding members of SME left with their tacit knowledge
Constraints of SME including: lack of human and financial resources, limited access to information
LCO can appropriate most of the value from the SME
LCO does not deliver on what was promised
Collaborative project has little impact on growth strategy of LCO
Lack of entrepreneurial attitude by LCO
Divergent cultures
Fear of SME being acquired by the LCO

The fear of acquisition and opportunistic behaviour by LCOs fosters an atmosphere of distrust between the SMEs and the LCO. Although there is a need to partner with each other, it appears that the SME has more to lose in such a partnership. The imbalance in power between the two, as well as the vulnerability of the SME, being largely at the mercy of the LCO, further enhances the level of anxiety and distrust experienced by the SME. We shall examine this imbalanced relationship in more detail below.

1.7 An illustrative representation of an SME-LCO partnership

It is assumed that an SME has more to lose in a partnership between and SME and an LCO: firstly because the SME is in a much less powerful position when negotiating with an LCO, and secondly because it has fewer resources to enforce the terms of the partnership agreement. This is expanded on as follows where, unlike the LCO, the SME will be relying on input from fewer experienced managers; this may be a once-off experience and hence the CEO/management of the SME may lack previous experience in such negotiations; the SME might be cash-strapped, the owner/manager weary, etc, and therefore more desperate to reach an agreement, and hence willing to "bare all" in an attempt to attract a partner timely; the SME lacks resources to litigate in the event of breach of contract by the LCO, placing it in a very compromised position; the SME may not have a powerful presence in the market place and hence not have allies upon which to rely for support.

Anecdotal evidence suggests that there is a common perception by SMEs is that the large company has ulterior motives and does not negotiate in good faith. This perception might

lead to an atmosphere of distrust and fear for the SME. Negotiating with a large company is a daunting experience for most SMEs and often they feel exposed and very vulnerable. From discussions with SMEs it appears that dealing with a large company can be a "black box" experience for the SME, namely there are inputs and outputs, but limited real understanding of the factors, some of which they may have control that can positively influence the successful conversion of inputs to outputs. This apparent lack of understanding by the SMEs can create an atmosphere of fear and distrust.

Theory (Das et al. 1998, Doz 1988, Hamel, 1991, Hennart and Reddy, 1997), refers to opportunistic behaviour by large companies and this is encouraged by the imbalance of power between large companies and SMEs. This view supports the common perception SMEs have of large companies viz. that they often are powerful and opportunistic. In discussing key differences between small and large power distance societies (such as in South Africa), Hofstede (1991:43) mentions that "might prevails over right: whoever holds the power is right and good … the powerful have privileges; power is based on … ability to use force." Extrapolating this theory from a society framework to a company framework, large established companies, having existing product ranges, serving existing markets and being financially strong, would have more "might" in a negotiation with an SME that lacks the product range, market access and financial clout. Inter alia, the LCO would be able to exert force on the SME such that its (the SME's) position is compromised in favour of the LCO. It appears, therefore, that given the appropriate circumstances, large companies are perfectly positioned to act opportunistically.

A diagrammatic model has been developed that defines the major categories as **attractants** (those SME features that attract the interest of an LCO), and **weights** (those considerations that will shift the balance of power in favour of the SME) (see Figure 1). It is assumed that this happens in the context of the political, economic, sociological and technical environment, these factors are therefore not explicitly tested in the research.

Figure 1 below illustrates main theme and ideas of this research project. As can be seen, the assumption is that survival and growth are the prime overarching business objectives of both LCOs and SMEs. Companies are continuously developing strategies to survive in today's dynamic environment as well as to grow their company's share value. These two ingredients are essential for company sustainability. For a company that is technologically innovative, part of its business strategy could include forming partnerships with other companies (large or small).

However, as touched on above, partnerships can be “risky business”. Particularly as we have seen above where partnerships between South African companies often include competitors, this can be a very sensitive and possibly vulnerable relationship. From the anecdotal case studies already discussed it appears that SMEs, when partnering with LCOs are particularly vulnerable, and that the balance of power is heavily in favour of the LCO. Power is defined by Hart and Saunders (1997:24) as “the capability of a firm to exert influence on another firm to act in a prescribed manner”. In commenting on the dyadic relationship between a buyer and supplier, Hart and Saunders (1997:26) describe power as a function of “1) dependence on the other party, and 2) the use of dependence to leverage change in accord with the intentions of the less dependent firm”. Hart and Saunders (1997:27) discuss the varying types of power. Persuasive power they explain focuses on “the rewards or benefits of making a change desired by the more powerful firm,” whereas coercion focuses on “punishment rather than benefits or inducements”. Persuasion is more effective than coercion in building long-term relationships. Coercion tends to reflect a short-term perspective.

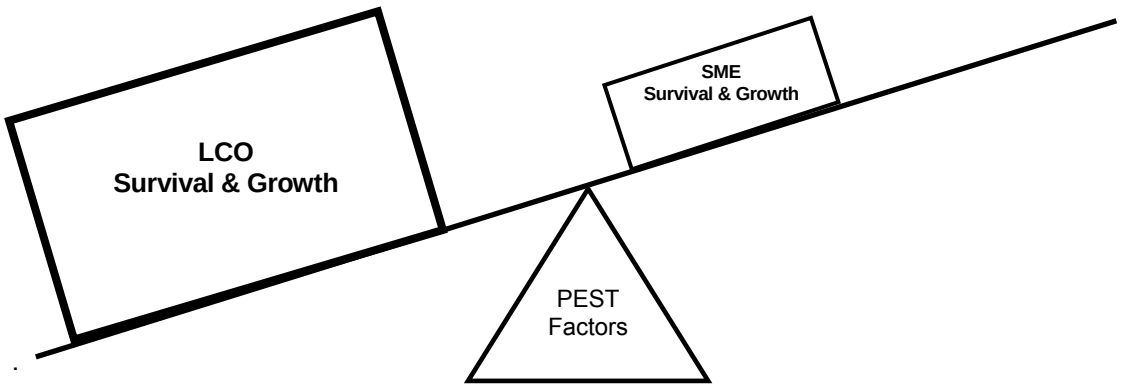
There is a large power difference between SMEs and LCOs, and there can be considerable dependence of SMEs on LCOs. This is illustrated in Figure 1 by the large block versus the small block on a see-saw. Because of the factors in its favour, the LCO has total control of the equilibrium position, tilting it severely in its favour. The SME is left suspended in the air, very exposed and largely at the mercy of the LCO (the LCO might even elect to bounce the SME off the see-saw!).

The SME needs to identify what would shift the balance of power in its favour and hence not only strengthen its position such that it can negotiate a fair deal, but also minimize the need for enforcement of the terms and conditions of the partnership agreement. Not only should the SME understand its own competences, capabilities and hence its capacity for offering the LCO business opportunities, but it should understand any additional considerations that would facilitate a successful partnership. The adage “knowledge is power” should not be underestimated in this environment of SME-LCO negotiation.

In the absence of adequate resources to protect itself, this research proposes that an understanding of as much as possible about the prospective large company partner strengthens the negotiation position of the SME, and can shift the balance of power in the SME’s favour. The assumption is that not only should the SME understand its own offering and why it is of interest to the potential partnering large company, but it should also understand the environment and what motivates the large company to partner with it.

It should understand those variables that are responsible for successful partnerships, such that it can correctly align itself with the most important variables. Furthermore, it needs to get the "recipe" for a successful partnership correct in order to minimize the need for enforcement of the terms of the partnership.

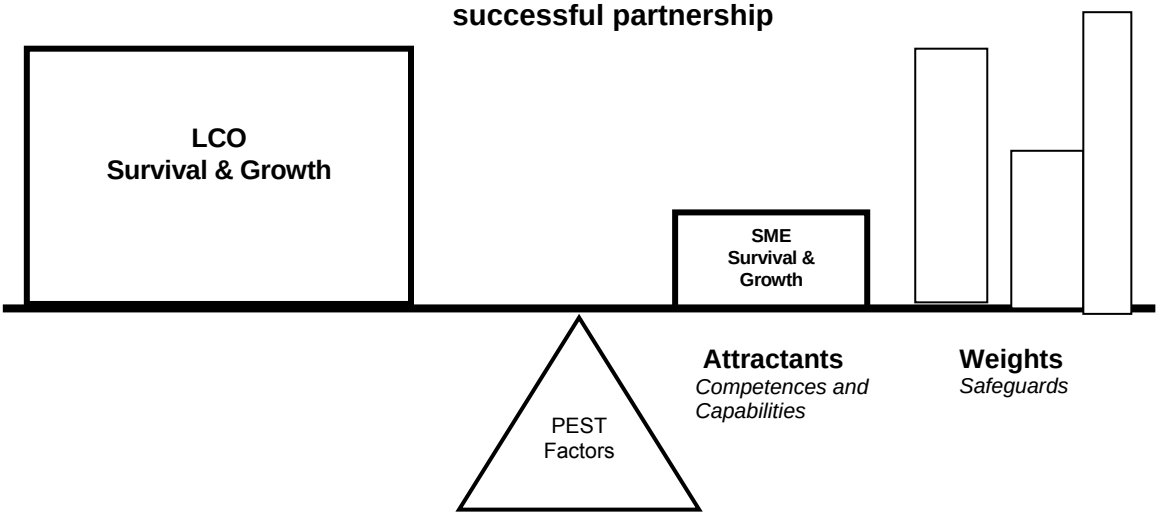
Figure 1: Imbalance between an SME and an LCO



The LCO may engage with the SME drawing it closer to itself because of the various opportunities that the SME presents. These opportunities that are categorized as "attractants" would typically be the *competencies and capabilities* that the SME has and for which it has been recognized.

One way that the SME can return the see-saw to equilibrium is by adding additional weights to its own side to compensate for the "heavy weight" LCO on the other side (Figure 2). These "weights" can be better described as *safeguards* or considerations that would empower the SME to negotiate and manage the relationship with the LCO with more authority and assertion, and that would encourage a successful partnership hence minimizing the need for enforcement of the partnership terms and conditions. By having much additional weight, or a high level of these safeguards, the SME should be able to return the see-saw to equilibrium.

Figure 2: Restoring the balance between an SME and an LCO to facilitate a successful partnership



1.8 Summarized problem statement and research goals

Figures 1 and 2 illustrate the problem and the solution that will be researched. To reiterate, the balance is tilted unfavourably for an SME when it partners with an LCO. This imbalance can result in opportunistic behaviour being displayed by the LCO that will lead to the need for enforcement by the SME in terms of the partnership. However, the SME, due to the limitations associated with its small size, is not well positioned to enforce the terms of the partnership, and hence may not be able to prevent the LCO from acting opportunistically. The end result of this behaviour would be an unsuccessful partnership.

The aim of this research is therefore two-fold, namely, firstly it is to gain insight as to the variables affecting the balance in position between an SME and an LCO, and secondly, to arrive at a set of recommendations for SMEs that wish to partner with LCOs in terms of how best to prepare for and manage the relationship.

The above variables (competences and capabilities, and safeguards) will be identified, described and empirically related to partnership success. Furthermore, their relationships with each other will be determined. Questions to be answered include:

- to what extent does the number of competences and capabilities that the SME has affect the success of the partnership?
- does the level of safeguards (weights) enhance the relationship between competences and capabilities (attractants) and the success of the partnership?

Restoring the “balance” has been discussed earlier as a means of empowering the SME to minimize the need for enforcement of the partnership terms and conditions. The additional weights to bring the see-saw back into equilibrium have been labelled “safeguards” and it is suggested that if the SME has a high level of these safeguards it should be able to return the see-saw to equilibrium.

The next chapter will discuss the context of the “see-saw” model. The main research question and the practical and scientific relevance of the research will be expanded upon.