‘Key Drivers of Product and Service Innovation in Companies’

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Abstract

Innovation is internationally recognized as an important source of competitive advantage. It was the aim of this research to isolate which factors play a key role within South African firms in unlocking their product and service innovation ability, and in so doing potentially promote prosperity for firms individually and for the country as a whole.

Six factors were posited as propositions on the basis of what crystallized out of the literature review. A survey was distributed in electronic format to senior managers in 70 firms and the respondents were asked to rate 29 statements on a 5 point Likert scale. Factor analysis was conducted on the data collected in order to establish what the key drivers of innovation are.

Although the factor analysis which was conducted did not clearly point to the six propositions initially identified, generalized groupings of questions pertaining to the six propositions were isolated. The study does serve to confirm the existence of each of the propositions as drivers of product and service innovation in South African firms.

Declaration

I declare that this research report is my own, unaided work. It is being submitted in partial fulfillment of the requirements for the degree of Master of Business Administration in the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

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Glossary of Terms

ISO9001: International Standards Organisation quality management standard.

List of Abbreviations

BEE:	Black Economic Empowerment
DTI:	Department of Trade and Industry
FMEA:	Failure Mode and Effects Analysis
HR:	Human Resources
HV:	High Voltage
ICT:	Information Communication Technology
ISO:	International Standards Organization
IT:	Information Technology
MV:	Medium Voltage
OEM:	Original Equipment Manufacturer
R+D:	Research and Development
SETA:	Sector Education and Training Authority
SME:	Small and Medium Enterprises

SMME: Small, Medium and Micro Enterprises

SPii: Support Program for Industrial Innovation

UK: United Kingdom

USA: United States of America

1. INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to determine what factors are the key drivers of innovation in South African firms. Examining these factors could be helpful to firms wishing to increase their innovative capability and thereby increasing their competitiveness in the marketplace.

1.2 Context of the study

The importance of innovation in generating economic prosperity has been widely researched. The conclusion has been that innovation does create economic prosperity, both on the level of the individual firm and the economy of a country as a whole (Schumpeter, 1942, Dodgson, Gann & Salter, 2002, Oglobina, Faria & Cardoso, 2002, Jagersma, 2003). This research intends to isolate the key drivers of innovation in the context of South African firms, with a view to creating a framework to increase the innovation ability of South African firms. This would increase the economic prosperity of individual firms as well as the South African nation as a whole. The European Union, the United States and Japan have dominated innovation internationally and their economies have prospered considerably over the past 10 years as a result (Jagersma, 2003). South Africa through increasing the role that innovation plays in its economy could possibly enhance its global competitiveness.

1.3 Problem Statement

The purpose of this research is to determine what the key drivers of product and service innovation are in South African firms.

1.4 Significance Of The Study

The study will hopefully contribute to isolating what the key drivers of both product and service innovation are and in so doing assist South African firms in their quest to improve their innovation capability and thereby increase their competitiveness, both locally and globally.

1.5 Delimitations And Limitations

1.5.1 Delimitations

This research shall be limited to the innovation of physical products and services only. It shall not include process innovation or management innovation.

1.5.2 Limitations

This research will be conducted on the basis of a questionnaire containing 29 statements which the respondent is asked to rate on a 5 point Likert type scale, from Strongly Agree to Strongly Disagree, together with open ended questions to provide context.

The questionnaire will be distributed electronically and respondents will return them to the interviewer upon completion. The interviewer will not be present during the completion of the questionnaires in order to provide the respondents with any guidance or assistance with questions which respondents have difficulties in interpreting. A pilot study will be conducted prior to the research in order to ensure that the questions are easily understood, and thereby minimize the risk of poor interpretation by respondents.

2. LITERATURE REVIEW

2.1 Introduction

As a starting point the definition of innovation was examined, together with the nature of innovation. The importance of innovation to business was also assessed. The sources of innovation which have been identified are then described. Lastly, several frameworks which are found in the literature are studied.

2.2 Innovation

2.2.1 Definition of Innovation

Dodson, Gann & Salter (2002) define innovation as “the productive use of knowledge manifested in the successful development and introduction of new products, processes and/or services”.

Hellstrom & Hellstrom (2002:108) define “organizational ideation” as “the process of creating useful conceptual novelty, and the circulation and taking on of that novelty in an organization, i.e. the organization's ability to create and retain new ideas for the purpose of survival and growth".

2.2.2 The Nature of Innovation

Innovation is seldom the result of flashes of creative genius, but rather the product of a focused and comprehensive approach to innovation (Drucker, 2002). Innovation was at first believed to be a linear and internal process whereby product development was driven by research. Increasingly innovation is viewed as a non-linear and evolutionary process with a high degree of interaction between the firm and the market. Knowledge is becoming increasingly important and is not only relevant at the inception phase of innovation but throughout the process. Uncertainty with regard to both technology and the environment is a characteristic of the innovation process. The environment on both a national and regional level within which innovation takes place is important to the creation and implementation of innovations. Routines and set procedures are important to provide a framework within which meaningful innovation can take place (Oglibina, Faria & Cardoso, 2002). Research has shown that innovation is not created randomly but is instead path dependant. This means that innovation is dependant on a variety of factors which create a path along which innovation takes place (Corti & Lo Storto, 2000).

The importance of innovation within a corporate context has been shown to be cyclical. Investment in innovation is often highest after a boom-bust cycle. This has been the case in the 1960’s, 1980’s and 1990’s. Innovation budgets are often slashed in times of economic difficulty, with the result that both good and bad innovations are discarded. Companies need to adopt a more balanced approach to innovation, something akin to the adoption of quality as a necessity and not a cyclical phenomena (Wolpert, 2002).

Innovation is central to economic prosperity but is characterized by complexity, ambiguity and risk (Dodgson *et al.* 2002). Innovation within firms can be the result of the implementation of structured models or frameworks or else merely as a result of competitive pressure on the firm (Radnor & Noke, 2002).

Innovation amongst firms can impact on the economy of a nation (Khan, 2002). There is a marked difference between innovation inputs and outputs, depending on the country within which innovation takes place. Certain governments are more supportive of innovation, extending grants to innovators, providing subsidies and creating the infrastructure necessary to encourage innovation. The uptake of innovative products is much higher in certain countries when compared to others. This can be dependant for instance on cultural aspects which in turn influence the purchase of new products (Hinloopen, 2001).

Companies do not compete on new products, but rather on the capacity and capability to develop new products (Prahalad & Hamel, 1990). There is no one generic formula or model for the creation of innovation capability, but rather common traits which are found in both innovative and non-innovative firms (Lawson & Samson, 2001).

Managerial and technological innovations need to be adopted simultaneously in order to maximize the leverage which technological innovations can bring (Farrell, 2003).

Innovation in products, processes and technologies increased dramatically in the late 1990's which in turn lead to dramatically higher productivity. The period was characterised by fierce competition which acted as a catalyst for innovation. The dismantling of regulatory frameworks has stimulated competition which has resulted in increased levels of innovation. Information technology facilitated the development of new products together with innovative processes. Innovations have diffused through industries rapidly as a result of information technology. The impact of information technology on innovation is felt the most strongly in industries which are characterized by a high level of operational complexity, high transaction volumes, and technologically advanced products (Farrell, 2003).

Susan Fournier, a Harvard Business School associate professor warns that changing a product too radically can result in the loss of customers. Strong brands do change, but success is based on knowing what can be changed and what cannot, without hurting the brand (Teresko, 2002) Focus groups which are used as a tool to find out from consumers what changes to existing products they would like to have implemented, typically request that only small changes be made to the product. When these minor changes are made, the altered product is often unsuccessful as the changes are too insignificant to change the entrenched buying habits of consumers (Goldenberg, Mazursky, Horowitz & Levav, 2003).

The 1970's and 1980's were characterized by incremental innovation, small changes were sufficient to drive growth in firms. Markets were highly protectionist through regulation and government intervention. Oligopolistic behaviour in developing markets through government protection increased prices to local consumers and made export difficult. Today the highly competitive environment which most firms find themselves in calls for radical innovation on a continuous basis. Trade liberalization and the emergence of a knowledge based economy has driven this process (Mytelka, 2000).

The adoption of an innovation needs to be viewed in terms of the needs and wants of users, and not merely according to the internal requirements of the firm. The evaluation of the advantages and disadvantages of an innovation is dependant on the expectations, interests and problems which the user is faced with (Akrich, Callon & Latour, 2002).

The importance of being able to communicate innovation to the audiences that matter cannot be overlooked. Great products which are not effectively communicated to decision makers, financiers, customers and the media are often failures. Thomas Edison, although a great inventor was also an excellent businessman. Edison was a brilliant communicator and had a clear cut strategy for converting Americans from gas to electric lighting. He spent a lot of time convincing bankers, journalists, scientists and the public of the virtues of his invention (Akrich, Callon, Latour & Monaghan, 2002). Venture capitalists invest in innovation for a living. 90% of entrepreneurial businesses which are unable to attract venture capital fail within three years. Venture capitalists increase the potential success of innovation on three levels. Firstly they are good at selecting potential winners, secondly they bring discipline to the venture and thirdly they have an extensive network of contacts (Amram, 2003).

Product driven success in companies can be short-lived. Companies often become complacent about the amount of growth left in their strategies following radical technological innovation. These innovations spur tremendous growth for companies, growth which is often followed by the rapid decline of the firm as the innovation is copied by competitors and new innovations take its place. This is particularly evident in high-tech firms, with companies such as Palm, Apple and

Iridium initially experiencing enormous growth followed by rapid decline as market dynamics changed. The majority of new ventures based on technological innovation fail to launch successfully. Relying on technological innovation as the only source of growth in revenue is a high risk strategy for companies (Slywotzky & Wise, 2003).

Although companies are under continuous pressure to innovate, few of these innovations are successful. Up to 70% of new technology projects fail. Reasons for failure include a lack of synergy between goals and actions, a lack of employee involvement in idea development and problem solving, poor planning and controls, inadequate measurement and management of the innovation process, failure to integrate the key elements of the process and ineffective leadership (Dooley & O'Sullivan, 2001).

The world has been characterized by cycles of technological innovation which are approximately 50 to 60 years in length, which had been relatively consistent since the 18th century. Each wave of innovation led to a new economy characterized by huge amounts of excitement and investor activity which ultimately culminates in a crash. These cycles are however becoming progressively shorter (The Economist, 2001, 360 (8240)). The last completed cycle which started in the 1950's and was based on petrochemicals, electronics and innovation lasted approximately 35 years. The latest cycle which started in the late 1980's and which is driven by computer networking is expected to last approximately 25 years (The Economist, 2001, 361(8251)).

2.2.3 The Importance of Innovation

Innovation is key to competitiveness in today's business environment. It is no longer possible to create competitive advantage through streamlining operational processes or cutting prices. The economies of the United States, Japan and the European Union derive more than half of their growth from companies which hardly existed 10 years ago. The argument is that innovation has therefore become a key issue to companies. Innovation is still however not a widely adopted notion, and reasons for this could be that it is not easy to implement in companies and there is no recipe guaranteeing success (Jagersma, 2003).

Innovative firms are generally more successful in both industrial and commercial markets than those which do not continuously focus on innovation. Information technology has had a major impact on a business environment which is now characterized by the shortening of product lifecycles, increased market fragmentation, blurred industry boundaries, flatter organizational structures and globalization (Ozsomer, Calantone & Di Benedetto, 1997).

Empirical studies indicate that productivity, competitiveness and growth are coupled to the ability to innovate. This occurs on the level of the firm as well as on the level of national economies (Oglobina *et al.* 2002).

A recent study by Bain & Company of more than 200 senior executives showed that over 80% of them regarded becoming more innovative as one of their top three priorities for achieving success for the firm. 91% of the executives viewed an increase in the capacity of their firms as critical to create competitive advantage and generate profits (Rigby and Zook, 2002).

The performance hurdles for successful innovation are becoming increasingly difficult to overcome, as more and more companies adopt an innovation focus. Innovation is becoming a pre-requisite for business, as opposed to a source of additional competitive advantage (Lawson & Samson, 2001). Survival is dependant on the firm investing in technology, training and people in addition to forming strategic alliances and outsourcing non-core activities, in order to focus on innovation (Walker & Lewis, 2003).

In a study conducted by Nohria, Joyce and Roberson (2003) of management practices essential to business success, four primary and four secondary practices were identified. The primary practices consist of strategy, execution, culture and structure which are considered to be fundamental to business success. The authors contend that two of four secondary practices, namely talent recruitment and retention, innovation, leadership and mergers and partnerships should be adopted in addition to the primary practices in order to achieve consistent business success.

In the 1980's and 1990's firms concentrated their efforts on operational efficiency as a source of competitive advantage. Competitive advantage was created on the basis of the leveraging of efficiency, quality, customer responsiveness and speed. Today however mastery of these issues has become the minimum entrance level to succeed in business. Innovation capability is required, which not only entails the ability to create once-off innovation, but rather the ability to consistently and quickly produce winning innovations on an ongoing basis. Business management skills have to be successfully implemented simultaneously together with innovation management skills, which effectively calls for the implementation of a holistic approach to developing the innovation capability of the firm (Lawson & Samson, 2001).

McDonald's is a good example of a company which has shifted its strategy from concentrating on operational efficiency and growth based on the addition of new stores, to a new model which is concentrating on innovation in order to drive growth. The company has introduced a range of nutritious meals to its product offering, including organic milk and salads. Stores are being redesigned in order to make them more comfortable and WiFi wireless computer access is provided free of charge to customers who purchase value meals. Vending machines are being developed in order to provide customers with convenient access to McDonald's meals (Madden, Mussey, Hall, Tungate & MacArthur, 2003).

The introduction of new digital technologies has led to the intensification of the innovation process through greater automation. Technology has impacted on innovation through the transfer, transformation and control of information (Dodgson *et al*. 2002).

Nohria *et al.* (2003) were unable to identify key sources of innovation amongst the 160 companies they studied over a 10 year period in order to identify the management practices essential to business success. It was however found that the majority of the companies excelled at innovation.

2.2.4 Sources of Innovation

Innovation is often uncovered internally within firms in four areas namely unexpected occurrences, incongruities, process needs and industry and market changes. In addition thereto three external sources of innovation are identified, namely demographic changes, changes in perception and the addition of new knowledge (Drucker, 2002).

People who encourage innovation in companies, so called idea practioners, share certain common traits. They all do four things, namely scouting for new ideas, packaging new ideas, advocating them and implementing them. Idea practioners share their personality traits with others, especially their optimism and self confidence. They are passionate about ideas in general. They know how to enlist key players within the organisation and are often members of extensive networks of expertise outside of the organisation (Davenport, Prusak & Wilson, 2003).

Factors which are associated with successful innovation include effective communication, both internally and externally, careful planning and project management, efficient research and development and production, service orientation, market orientation, key people and product champions and excellent management (Rothwell, 1992).

Firms with sufficient motivation and ability to invest in innovation are likely to be the most aggressive in pursuing innovation, especially radical innovation. A strong link has been found between the expectations which technology will bring and the investment in technology. Market domination reduces the motivation of a firm to engage in radical innovation (Chandy, Prabhu & Antia, 2003).

Capitalism is driven by a process of creative destruction. The notion of creative destruction is based on radical change in the form of innovation initiated by entrepreneurs, which changes the existing order. Dominance in the market place favours radical innovation (Schumpeter, 1942). In order to understand economic change it is important to first carefully consider innovation. According to Schumpeter the passion of the entrepreneur is the driving force behind the adoption of new productive combinations which lead to extraordinary profits. The entrepreneur is viewed as the visionary who could marry a new product concept with the effective commercialization thereof (Schumpeter, 1939).

Hiring staff from diverse backgrounds is a method which can encourage innovation in an organization (Harvard Business Review, 2003).

According to Craig Wynett, the general manager of future growth at Procter and Gamble a key to successful innovation within the company has been to make innovation the norm. Lieutenant General Ronald T. Kadish believes it is important to mix people up through reorganizing frequently. Michael Dell believes that innovation is about taking risks and learning from mistakes. Nolan Bushnell CEO of uWink and founder of Atari regards the building of a culture in which the notion of a bad idea does not exist, is important. Aligning business objectives with the ideals of the organisation is key to innovation according to Daniel Vasella, CEO of Novartis (Harvard Business Review, 2002).

2.2.5 Innovation Frameworks

An innovation audit is a good starting point for developing a culture of innovation which is based on interaction between both internal and external influences. The company should first examine its business objectives in order to identify which are critical to the future of the company and are in need of reinforcing. Next the innovation projects of the company need to be evaluated against these business objectives. Opportunities for innovation around the periphery of the business need to be identified. Interviews then need to be conducted, both internally and externally, to identify what the barriers are to innovation for the firm. A comparison needs to be conducted between the returns which the firm expects to generate from the implementation of innovations over a three to five year period versus the returns which competitors would be likely to achieve. Lastly the ten most important innovations of the company over the past few years need to be identified and analyzed. The question needs to be asked whether interaction with the external environment could have improved these innovations (Rigby & Zook, 2002).

Few companies are successful in continuously producing innovation, whether of an incremental or revolutionary nature. Innovation in companies requires a dual focus, namely on the future and the present simultaneously. Innovation results from divergent thinking in an environment which is often characterized by chaos and imagination. Most businesses are characterized by convergent systems based on order, measurability and control. A balance needs to be created in order to ensure that the company survives in addition to nurturing innovation in order to spur growth. A systematic approach to innovation is required which cultivates innovation and facilitates execution. Nokia has been very successful in this regard, largely due to its highly flexible organizational structure which integrates business with innovation. All members of the organization are engaged in the innovation process which is facilitated through the internal incubation of all new ideas ranging from the incremental to the revolutionary. Nokia ensures that every good business idea is incubated in order to ensure that the best ideas are executed, and not lost (Hickman & Raia, 2002).

A framework for encouraging both the acceleration and integration of technology can be based on four levels ranging from incremental to revolutionary innovation. The framework is intended to bring both divergent and cohesive thinkers together through a focus on the strategic scope as well as the organizational capabilities of the organization. The first level focuses on incremental innovation through the improvement of a product or service to reach its maximum potential without major changes to the strategy or organizational capabilities of the company.

The second level focuses on extending the product or service beyond the current strategic scope of the company without any changes to the organizational capabilities of the company. This would involve increasing the strategic advantage of the brand through the addition of new product or service categories, new market segments, new usages and new distribution channels in order to reach new markets and expand the customer base.

The third level involves increasing customer satisfaction and loyalty through the addition of new organizational capabilities. This would include the addition of new structures, systems, technologies, skills and services in order to provide enhanced service levels to customers. New organizational capabilities can be created through mergers, acquisitions, joint ventures, licensing agreements and other strategic partnerships. The fourth level is focused on innovation on both a strategic and organizational capability level. This involves innovation which is outside of the company's current strategic focus and organizational capability. This involves a high degree of creativity and revolutionary change for the company and its stakeholders. Embarking on these four levels of innovation is intended to assist businesses in embarking on a new growth path (Hickman & Raia, 2002).

Innovation needs to be actively directed, stimulated and managed according to four phases, namely strategy development, ideation, evaluation and implementation. During the initial phase, namely the development of strategy success criteria, a written statement of goals and capabilities should be compiled, consisting of a ranked list of criteria against which potential innovation projects should be measured. A cross-functional project team needs to be formed consisting of members from all departments relevant to the development of a new product in order to capture the essential elements of the ideal new product. The team needs to focus on issues such as market size, segmentation, the required return on investment, time and budgetary constraints, operational capacity and market penetration issues. This phase focuses on leveraging the organizations strengths. Identified opportunities in the future need to be evaluated against the organizations present capabilities, and an overlap identified. The second phase is concerned with ideation, and involves a process of new idea generation, with inputs coming from both external experts and internal contributors. Innovation sessions are suggested whereby a small group of recognized experts is brought in for an innovation brainstorming session. The suggestions made by the outside experts are then carefully recorded and categorized for analysis by internal contributors. The purpose of this process is to allow members of the organization to then build on the concepts generated by the outside experts. The third phase consists of evaluating the concepts proposed by the outside experts against the ranked success criteria developed during the first phase of the innovation process. The format of this process should be an internal innovation session attended by the members of the project team. The concepts are voted on by the members in order to arrive at a consensus as to which concepts should be proceeded with and which should be discarded. The fourth phase is a process of implementation, which starts with an analysis of the particular market which the concept will be introduced into. Should the product fail this litmus test it needs to be discarded. Potential users of the product need to be interviewed in order to gauge the future success of the product (Buggie, 2001).

The implementation of 10 strategies can provide the key for successful innovation. Firstly an innovation vision should be adopted. This involves identifying major innovation opportunities, success factors and the innovation goals of the company. Secondly a superior innovation process needs to be created and managed. This ensures that the return on innovation efforts is maximized at the minimum cost. A comprehensive innovation concept evaluation process needs to be implemented to ensure that only the best concepts are chosen. Thirdly, innovativeness has to be institutionalized. The focus of this strategy is the creation of a culture of innovation within the company. The idea of creative destruction proposed by Joseph Schumpeter needs to be adopted on a company wide basis. New ideas which meet the criteria set by the organization need to be adopted and defunct products and processes need to be discarded. The next strategy involves benchmarking the innovation against the best competitors in the marketplace. The fifth strategy demands that innovation be driven from the top down. Organizations often display an inherent rejection of innovation, and the leaders of the organization need to champion innovative ideas and nurture them. Strategy six is concerned with the development of commercialization skills. Both internal risks in terms of the capacity of the organization and external threats involving competitor response, market reaction and customer uptake need to be effectively managed. A strategy needs to be developed in order to ensure the successful commercialization of the product, as it is at this stage that many innovations fail. The next strategy involves an excellent understanding of the customers wants and needs. The eighth strategy requires the adoption of a team approach. Successful innovation is often based on cooperation between members of project teams, and not individual effort. Interaction on a cross-functional basis increases cross-pollination which stimulates innovation. The ninth strategy demands a passionate obsession with generating and implementing new ideas. Innovation needs to be motivated by passion. Lastly innovative companies follow a strategy which recognizes that change is the primary driver of innovation, which results in change being embraced in these organizations (Jagersma, 2003).

Invention and pioneering are dominant themes in innovative firms which are clearly adopted by the leaders of the organization. The strategy of the firm is then centred around innovation, which then in turn influences the organizational design and structure. Innovative firms have highly flexible structures which facilitate the development and implementation of new ideas. Innovative companies have a higher propensity toward engaging in risk taking and are strategically ideally positioned to capitalise on the opportunities which a hostile and highly competitive environment present (Ozsomer, Calantone & Benedetto, 1997).

The adoption of innovation as a management practice is dependant on four kinds of behaviour. Innovative companies continuously engage in innovation and adopt a proactive approach to the future as opposed to a reactive approach. They pursue disruptive technologies in order to harness these in the creation of innovative products and services. Innovation requires that existing products be cannabilized in the process of introducing new products. New technologies should be utilized to enhance operations, and not reserved for the creation of new products and services (Nohria, Joyce & Roberson, 2003).

A framework for the creation of innovation capability which is designed to manage, systemize and replicate innovation within an organization should contain seven elements, namely vision and strategy, harnessing the competitive abilities of the firm, organizational intelligence, creativity and idea management, organizational structures and systems, culture and climate and the management of technology (Lawson & Samson, 2001).

Systematic inventive thinking is a useful method to encourage innovation in firms. The method uses a product as a starting point and examines the characteristics of the product, as opposed to examining customers needs and wants. The new product is first developed and only then is market research conducted to ensure the consumer acceptability of the product. Five patterns of innovation are at the centre of this method. The first is subtraction. The immediate temptation when developing new products is to add features, but instead removing useful features of the product can result in a breakthrough. Phillips achieved this very successfully when they removed the graphic display and several buttons on a dvd player and transferred these functionalities to the remote control and on-screen user interface. This resulted in the development of an ultra-slim range of award winning dvd players. Multiplication is another useful method for stimulating innovation. It involves taking a product feature and multiplying the number of these features. This was done very successfully by Gillette who added an additional row of blades to their razors which resulted in the double-bladed razor. Division can be utilized to identify the separate components of a product and additional functionalities. This happened in the hi-fi industry when the integrated hi-fi was separated into its individual components, a development which allowed customers to customize the system to suite their own individual preferences. Task unification is the process of assigning additional tasks to an existing product feature. This was implemented by car manufacturers who managed to do away with car radio antennas by integrating the antenna into the defrosting element in the windscreen. Attribute dependency change involves creating dependencies between product attributes and their environment which never existed previously. This was done with sunglasses. The colour of sunglass lenses was never dependant on lighting conditions, but creating a lens which changes colour according to lighting conditions created such a dependant relationship. These methods have been utilized very successfully by many companies and create a disciplined structure within which innovation can take place (Goldenberg *et al.* 2003).

Innovation can be examined in the context of three core contingencies. These are firstly organizational learning, namely the learning ability of the firm. The second core contingency is legitimacy which includes both the cognitive legitimacy as well as the socio-political legitimacy of the innovation. Cognitive legitimacy is concerned with the compatibility of the innovation with its environment, while socio-political legitimacy is the acceptance of the innovation by key stakeholders such as decision makers, the public and the government. Thirdly the attitude of the firm towards creating niches for their products is examined. From a strategy perspective the first two of these core contingencies should be assessed at three levels of strategic decision making namely, within the firm, on an industry level and between the firm and the community (Chritiansen & Christer, 2002).

2.3 Conclusion

Innovation is a non-linear process, dependant on a variety of both internal and external factors (Oglibina *et al*. 2002) Innovation needs to take place within a structured environment and is not generally created on a random basis, but should be an ongoing part of the business process (Corti & Lo Storto, 2000, Wolpert, 2000).

Innovation has been identified as playing an important role in the sustainability and growth of firms, and the economy as a whole (Dodgson *et al.* 2002, Radnor & Noke, 2002, Khan, 2002, Hinloopen, 2001, Schumpeter, 1942). Innovation is key to the competitiveness of the firm (Jagersma, 2003, Ozsomer *et al.* 1997, Oglobina *et al*. 2002).

There are a variety of drivers of innovation within a firm. These drivers exist on different levels and in different dimensions and include processes, methodologies, frameworks, external environments and organizational structures.

2.4 Research Questions

The research problem stated above is to determine what the key drivers of product and service innovation are in South African firms. After examining the literature review the following propositions have been posited:

2.4.1 Propositions

PROPOSITION 1: A SET PROCEDURE IS REQUIRED WITHIN A FIRM IN ORDER TO EFFECTIVELY HARNESS INNOVATION

PROPOSITION 2: INNOVATIVE FIRMS HAVE DEVELOPED STRATEGIES WHICH FOCUS ON INNOVATION

PROPOSITION 3: THE ENVIRONMENT ON BOTH A NATIONAL AND REGIONAL LEVEL WITHIN WHICH INNOVATION TAKES PLACE IS

IMPORTANT TO THE CREATION AND IMPLEMENTATION OF INNOVATIONS WITHIN FIRMS

PROPOSITION 4: INFORMATION TECHNOLOGY AND THE RAPID DISSEMINATION OF INFORMATION PLAYS A KEY ROLE IN INNOVATION WITHIN FIRMS

PROPOSITION 5: INNOVATIVE FIRMS ARE CHARACTERIZED BY A SPECIFIC KIND OF CULTURE WHICH FOSTERS INNOVATION

The culture of an innovative firm may include the presence of factors such as : effective leadership, effective communication, commercialisation skills, a customer orientation, effective management of diversity, a culture of risk taking, passion, flexibility and an organizational learning ability.

PROPOSITION 6: INNOVATION IS STIMULATED BY THE PRESENCE OF SPECIFIC EXTERNAL FACTORS

These factors may include: competition, the needs and wants of consumers, market reactions, demographic changes, strategic alliances, outside experts and networks.

A consistency matrix is attached hereto as Appendix A.

3. Research Methodology

3.1 Research Method And Its Underlying Characteristics

The methodology employed will focus on establishing the cause-effect relationship between the key drivers of innovation, and innovation itself.

3.2 Population and Sample

3.2.1 Population

The population will consist of all firms in South Africa, regardless of whether they produce physical products or services.

3.2.2 Interview Sample

The sample consists of both large corporate, medium and small entrepreneurial firms. These firms have been selected depending on the researcher's access to firms and their willingness to partake in the study. The sample is therefore a convenience sample, but the researcher endeavored to recruit respondents from a broad range of diverse industries. Respondents are senior managers in the firms, and the total sample consisted of 70 firms.

3.3 Measuring Instrument

The measuring instrument is in the form of a questionnaire. The first part of the questionnaire is used to gather demographical information from respondents. The second part of the questionnaire contains 29 statements which represent the constructs. These statements have been developed from the literature review and respondents have been asked to rate these statements according to a 5 point Likert scale, ranging from strongly agree to strongly disagree. In addition to each statement, an open ended question was provided after each statement to provide context. The questionnaire was posted in electronic format on an internet based research website, www.surveymonkey.com. A sample of the questionnaire is attached hereto as Annexure C. Respondents were sent an email containing a link which took them directly to the survey on the internet.

3.3.1 Advantages

A questionnaire distributed by email allows for wide distribution of the sample. The questionnaire is not subject to interviewer bias, and allows respondents to work at their own pace. Response times are generally short (Churchill &

Iacobucci, 2002). The electronic format of the questionnaire allowed for easy and quick completion and submission to the interviewer by respondents.

3.3.2 Disadvantages

Response rates can be quite low. This has been mitigated through contact with respondents prior to the questionnaire being dispatched and again thereafter in order to ensure that they are timeously submitted. Another disadvantage is that ambiguous questions cannot be explained to respondents. The propensity for this occurring has been mitigated through the running of a pilot study prior to commencement of the actual survey (Churchill & Iacobucci, 2002).

3.3.3 Administration

The questionnaires were distributed via email to respondent's and returned to the researcher via email. A covering letter accompanied the questionnaire and was designed to optimize the rate of accurate completion and submission of the questionnaire. The covering letter is attached hereto as annexure B.

3.3.4 External Validity

In order to ensure the external validity of the research, as wide and diverse a range of respondents needs to be selected in order to ensure that the sample has relevance to the entire population. A convenience sample has been used in this research, but care has been taken to ensure that respondents are selected from as diverse a range of industries, and geographical locations as possible.

3.3.5 Internal Validity

A pilot study was conducted to ensure that the constructs are clearly understood, prior to conducting the actual research.

3.4 Data Analysis

The Likert scale used in the survey was first converted from an ordinal scale to an interval scale utilizing correspondence analysis (Bendixen & Sandler, 1995). The values on the Likert scale were initially:

1= Agree Strongly

2=Agree

3=Neither Agree nor Disagree

4=Disagree

5=Disagree Strongly

After the rescaling process was undertaken the re-calculated values were:

1= Agree Strongly

2.019=Agree

3.146=Neither Agree nor Disagree

3.993=Disagree

5=Disagree Strongly

The rescaling procedure allowed further analysis to be conducted in the form of factor analysis, which would otherwise not have been feasible.

A correlation matrix was constructed to ensure that the variables are correlated. The correlation matrix is attached hereto as Annexure F. Thereafter, using NCSS statistical software a factor analysis of the data was undertaken. Common factor analysis with varimax rotation was selected. The output of the factor analysis is attached hereto as Annexure G.

Common factor analysis was utilized to determine the common variance in the data, in order to determine what the underlying variables are. A scree plot has been included to ascertain how many of the variables should be included (Malhorta, 1996), and is included in Annexure G. The eigenvalues were also examined in deciding on how many factors to retain and 1 was used as cutoff point as a clear distinction was apparent between factors above and below this number.

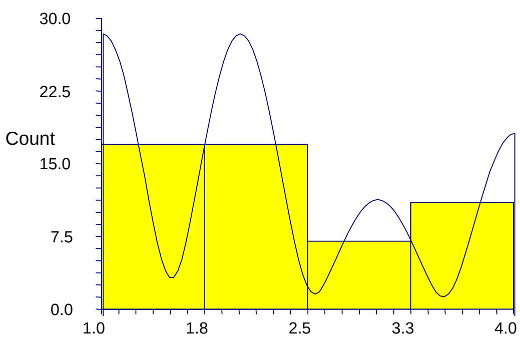
The factors identified as key drivers from the results of the factor analysis will be compared against the factors identified in the literature review and initially posited as propositions. On the basis of this comparision, these propositions will either be rejected or accepted.

4. Research Results

A total of 52 completed questionnaires were returned out of the original 70 which were distributed. The researcher contacted each respondent telephonically and thereafter by email, in order to ensure a high response rate. Follow up emails and telephone calls were made to further maximize the response rate. The responses to the open ended questions have also been included to provide context and have been content analyzed in order to determine any common themes

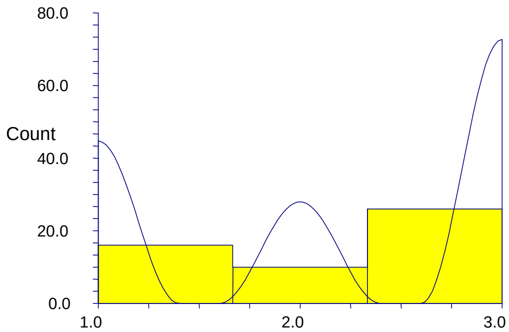
4.1 Survey Results

nQ1. Number of employees			
I	**<10**	**32.7%**	**17**
II	**10-50**	**32.7%**	**17**
III	50-100	13.5%	7
IV	**100+**	**21.1%**	**11**
	Total Respondents		**52**



Count	**Mean**
52	2.230769

Q2. Turnover			
		Response Percent	**Response Total**
I	R0-R5 000 000pa	30.8%	16
II	R5 000 000pa-R10 000 000pa	19.2%	10
III	**R10 000 000pa+**	**50.0%**	**26**
		Total Respondents	**52**



Count	**Mean**
52	2.192308

Q3. Industry type	
Total Respondents	**52**

Auctions and Valuations
Photography
Advertising
Construction
Communications
Hospitality
IT
Telecommunications
Aquaculture
IT
Labour
Security
Insurance
Timber
Electronics
Vehicle Tracking
IT
IT
Property
Engineering
Textiles
Logistics
Manufacturing cleaning products
Aviation
Industrial Property
Law
IT
Manufacturing
Back-office services
Travel & Tourism

Industrial Detergents
Administration
Clothing
Real Estate
Medical Pharmaceutical
Merchant Banking
Mechanical Engineering
Clothing Manufacturing
Exhibitions
IT and Research
Telecoms
Food and Beverage
Mining
Media
ICT - Spatial Information Solutions
ICT
Information Technology
Information Technology and Business Consulting Services
Manufacturing
Automotive Electrical Systems
ICT - New media
Manufacturing ,Services (Electrical)

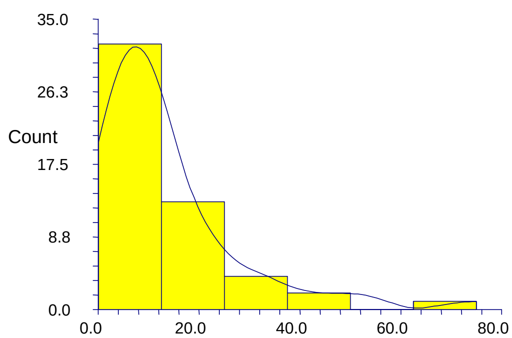
Q4. Position held	
Total Respondents	**52**

Group Director
Owner
Director
Managing Director
Director
General Manager
Managing Director
Marketing Director
Managing Director
CEO
Director
Director
Director
Owner
Director
Director
Managing Director
CEO
Owner
Director
General Manager
Director
Director
Managing Director
Director
Director
Director
Attorney
Director

Managing Director
Director
Branch Manager
Managing Director
Managing Director
Director
Director
Medical Liason
Financial analyst
Co-owner
Marketing Manager
General Manager
Financial Manager
CEO
Owner/manager
Head: HR, Policy & Strategy
Director
Director
CEO
Managing Director
Head of Quality and Products
General Manager
Managing Director

Q5. Number of years in existence	
Total Respondents	**52**
9	
5	
2	
7	
6	
4	
15	
8	
6	
5	
11	
3	
17	
25	
5	
12	
8	
22	
9	
30	
6	
19	
6	
4	
14	
75	
5	
36	
1	
10	

15
8
4.5
50
15.5
8
15
5
8
21
35
3
17
6
2
11
3
5
7
4
1
3



Count	**Mean**
52	13.68423

Q6. City/Town	
Total Respondents	**52**

National
Cape Town
Pretoria
Johannesburg
Johannesburg
Durban
National
National
Cape Town/ Johannesburg
Johannesburg
National
Johannesburg
Johannesburg
National
Johannesburg
Durban
Johannesburg
Johannesburg
Johannesburg
Johannesburg
Cape Town
Johannesburg
Johannesburg
Johannesburg
National
Midrand
Johannesburg
Cape Town
Johannesburg
Johannesburg

Johannesburg

Pretoria

Johannesburg

Johannesburg

Durban

Johannesburg

Johannesburg

Johannesburg

Pretoria

Durban

Johannesburg

Johannesburg

Centurion

Johannesburg

Cape Town

Johannesburg, Durban

Johannesburg, Cape Town,
Durban

Johannesburg and Cape Town

Randburg

Pietermaritzburg

Cape Town

Midrand

Q7. My company has a set procedure for managing innovation	I	II	III	IV	V
	11% (6)	29% (15)	**33% (17)**	25% (13)	2% (1)
Total Respondents: 52					

Q8. My company has a set procedure for managing innovation, please explain: (40 responses)

Rigid procedures do not get along with innovation. We support free flow of ideas/imagination/thinking and the only limits are how the market will receive the new ideas.

Small Business, no set procedure.

Innovative ideas are lost when not properly managed.

A procedure is required to manage it not to encourage it.

A young dynamic team constantly on the look out for innovative ideas from both staff as well as management.

New ideas pop up all over in our company.

This does not need to be a formal set of procedures but rather a culture.

Strategic implementation of innovation without sound procedure is suicide.

Private company so autonomous decision making.

Ideas forum, innovation strategy sessions, rewarding innovative suggestions.

Good Global R&D Facilities and strong Marketing Department. Strong link between R&D activities Marketing product requirements.

Innovators are allowed to run with and manage their innovations.

No set procedure.

A company culture that encourages new and different ideas needs to be cultivated and entrenched into all team players. The company favours this approach.

Regular training and motivation.

Innovation is a spontaneous process.

We try and capture new ideas.

Incentives, recognition and rewards are given for coming up with new products.

As and when possible from a capability and financial point of view or from an advantage option. Mostly limited by the industry itself and R&D funds to support.

No formal procedure in place.

We brainstorm new product development adhoc, very informal.

We are a small company and interact very closely.

We are constantly formulating new exhibitions ideas and products.

Room for improvement.

Employing innovating people is more important than procedures.

Dynamic structures best for harnessing innovation - in some structures space to innovate is the best (think green circles in Japanese Keizan) others might prefer flexibility e.g advertising

Start up company based on an innovative idea, no procedure is currently in place.

Internal environment does not exist for such a procedure.

Discuss and move on any Ideas.

Innovation develops well when there are no boundaries, set procedures create boundaries hence limiting the full potential of innovation.

All product ideas go through a central person (me) and then need to be approved at board level.

We innovate as we see an opportunity with a customer or we see a competitor doing something different.

We tend to follow the same assessment process when it comes to determining whether to 'innovate' or not.

If we don't innovate we don't survive.

Innovation is not a procedure but a mindset.

We are driven by the needs of our market. We use technology where we can.

Innovation is encouraged and rewarded.

Templates for process modelling, approach.

Dedicated Advanced Engineering division to research 'blue sky' technologies.

We go through a process of listing client requirements, suggestions and ideas along with our own brainstormed ideas. These are frequently evaluated against market, strategic and delivery criteria.

In innovation lies the soul and heart of the company .The company is driven by the motif that ' the height of its success is equal to the depth of its innovativeness' On a daily basis we ask of ourselves ' what can be done better, differently and in addition to '

Q9. My company has the ability to quickly design, develop and launch new products					
	I	II	III	IV	V
	33% (17)	17% (9)	29% (15)	17% (9)	4% (2)
					Total Respondents 52

Q10. My company has the ability to quickly design, develop and launch new products, please explain: (35 responses)

We do not believe in speculation: we get an idea, develop same and apply it to the info/facts we have about our intended market and let them decide.

Company not innovatively orientated.

We get products to market as quickly as possible.

Law is a personal skill that does not allow practice in new fields over night.

In an ever changing internet world we have to and continue to change our product to meet market demands.

It takes time to get a new product to market.

We produce industry standard products. Not much innovation required only the capital equipment, working capital and experience.

Product development is ongoing and never stops.

We try and synchronize the different departments to speed up this process.

We have got excellent Marketing and R&D facilities but we could be faster at launching new innovations.

We are involved in an ever changing industry and it is adapt or die.

We have to have the ability to move quickly.

Part of the R & D goals.

Our very existence depends on our ability to get new products launched regularly and quickly.

The time to launch is what gives us an advantage over our competitors.

We are always trying to improve in this regard.

Investment industry changes quickly, we have to respond with new products all the time.

We are always in the process of launching new products.

We put money where the current cycle is leaning and focus on developing what that cycle dictates.

Once again this is possible, but influenced by the market, your abilities, links and financial standing.

Uncompetitive partners hamper us in this regard.

We do have quick turnaround times for product development and marketing.

Full design studio, experienced staff and fully mechanized factories.

Hands on technical director which works close to me; decisions are taken at lower levels.

Small team, same goal!

It is our focus.

This ability exists, but does not take place because there is no internal environment for this to take place.

Product design is a process, and takes time.

We are a flexible company with young staff that do not have fixed ideas.

This is the cornerstone of what we are built on - meet the need as quickly as possible.

Due to customer pressure for quick results we try and accommodate their required time frames.

Launch takes a bit longer because this requires procedure to ensure quality and predictability. Staying abreast and being proactive allows for quick response times to launching new products or functionality.

As consultants, we are as committed, focused and innovative on internal projects.

The automotive industry has very strict guidelines that slows the process.

The noun' quickly ' is all relative .Design ,develop and commercialization of new products is not a 'quick' process .

Q11. Government supports innovation within companies in South Africa					
	I	**II**	**III**	**IV**	**V**
	6%	21%	**42%**	17%	13%
	(3)	(11)	**(22)**	(9)	(7)
					Total Respondents 52

Q12. Government supports innovation within companies, please explain: (44 responses)

If it did there would be more money put in to support new businesses and there would be less onerous laws regulating the labour market.
Not aware of support from government to small businesses in respect of innovation.
Not aware of any explicit support.
DTI loans and information and SETA.
Only to a limited degree and as long as it fits into their bigger picture.
Government grants do exist for capital expansion.
We see little Government incentives that support innovation in our industry.
I have no idea.
Within certain boundaries.
Don't know.
I personally have never seen any marketing or promoting by the government around innovation.
I don't know.
Many initiatives are in place and I see Foreign Trading Policy attempting to achieve this.
I've heard they do, but haven't experienced it myself.
SPii is specifically geared to supporting innovation.
There is absolutely no incentive (financial, tax breaks, support) for innovation. The fact that I have to capitalize. Skills development is a priority and government

has facilitated training by means of the SETA'S.

Lack of support is evident in the small number of companies actually developing their own IP rather than servicing that of others.

Initiatives like top 100, empowerment legislation is certainly a strong indication to that.

Other than expense any item over R2,000 even if it is used purely for assessment.

Not aware of any assistance.

Only in terms of assistance with patent protection in foreign countries.

We are not aware of any support that applies to our industry.

No funding to us.

Support is very cumbersome - lots of red tape and controls.

More could be done but the Dept. of Trade and Industry does make an effort to support SMME'S.

No funds available in DTI schemes.

Limited support.

More support would lead to more market competition thus resulting in good products and service and more jobs.

Government should indicate needs where innovation is required.

Less focus on charters, more on productivity and innovation.

More knowledge, products and training for Companies is needed.

Many small start ups would be able to go a lot further if they did not have to comply with stringent company regulations.

Although there is much innovation in SA, much of it is not developed to it potential due to lack of financial assistance.

We need to create more jobs and to export more.

Incentive scheme would be nice.

Especially for SME, as that's where a lot of growth is needed (and regulatory flexibility).

They could give more support, there should be incentives for creating innovative products and services.

Don't believe innovation has anything to do with what the government does. Partnership between government and private organizations is vital to achieve global competitiveness.

The more the government does the better the country will be at innovating.

Basic tax breaks and incentives would help - nothing major but could be very important. Allow us to write off the entire cost of capital equipment used in product development..

I think government is well on the road to address the skills issue.

The drive is to become a world player. We have become a 'me too' and not a first tier. The result is that we are followers not leaders.

Tax breaks and incentives for developing and taking IP to market, government should try to pilot and possibly procure, where possible, local tech products.

Q13. My company has approached a government department for assistance with innovation	I	II	III	IV	V
	8%	13%	**33%**	25%	21%
	(4)	(7)	**(17)**	(13)	(11)
Total Respondents 52					

Q14. My company has approached a government department for assistance with innovation: (27 responses)

There is very little that government can do for our company except creating a public private partnership to train more people and enable them to be independent.

SETA program.

We are in negotiations with various government departments looking at using our innovative product.

Have not requested assistance with overseas patent applications as yet.

We are doubtful that we would get assistance.

From a financial point of view no.

We have to convince them in order to show the slightest interest. It is not an open industry the way that it should be.

The company was awarded by DTI a 50% grant .R 0'5 million for development of one of its products.

We have over the past years come up with excellent ideas, from industrialized and mechanized manufacturing to training of skilled machinists. None have been considered.

If one has to make the effort I am sure you could get support from government but I have not tried this as I feel it would be a waste of time.

No interaction with government in our organization.

Limited funding and grants available.

Never.

Deal with the government as little as possible.

Government lacks skill in this regard.

We have a Spii grant.

Government initiatives have basically just wasted our time.

Through DTI incentives. Though the paperwork makes it difficult for small companies.

For the first time in many years of hardship and crying out to the government for support we have now done so. New products are being developed as first time ever with world patents.

Have tried to work through DTI to no effect.

We are tired of asking for support from our government and are finding other ways to stay in the world markets. Support will be sourced and then awarded to our new partners, local and abroad.

Too much paperwork. Companies that do this want an upfront fee thus cannot guarantee any success as they take no responsibility.

Competitiveness fund.

DTI has been actively involved in our company and funded Effective Intelligence workshops amongst other courses.

Limited effort.

They wasted our time and messed us around.

DTI ,assisted us with development of a locally designed manufactured 40KA.3150 A ,11-15 KV ,switchboard.

Q15. Innovation is a key strategic issue in my company					
	I	**II**	**III**	**IV**	**V**
	39%	**39%**	17%	6%	0%
	(20)	**(20)**	(9)	(3)	(0)
					Total Respondents 52

Q16. Innovation is a key strategic issue in my company, please explain: (41 responses)

Before we arrived, our competitors thought there could be nothing better than them until we came up with new ideas and took over the market.

Innovation equals a few steps ahead.

Innovation will enhance profitability.

Not really, service provider that occasionally requires innovative thinking.

Marketing & Image innovation.

We need to change constantly in order to grow.

Capital equipment intensive.

Market changes very quickly.

Products that we produce and sell are relatively easy to copy and there is a low cost of entry. We must be innovative to stay ahead of the competition and to make speciality products not commodities.

We do not have any strategy whatsoever.

If not offering latest products, margin is low, then roe suffers, then share price plummets, then everyone retrenched.

The world is changing every day. New ideas must be explored and research done.

It should be a key issue, not sure if it is?

We are in a saturated industry and the only way we will survive is through innovation.

It is the only way to avoid decline.

Innovation is needed in order to maintain competitive advantage.

In the first 3 years innovation was key - now it's execution and production.

Again it is the foundation of our company - we are one of only a few companies in the world doing what we are doing.

To continuously offer niche value adding.

But also client orientation and quality.

We are the leaders in our field.

Innovation provides the platform for our business. In the ICT sector a company that does not embrace innovation will soon lose all their clients. Clients want/need new and creative solutions.

Revisit strategy frequently.

To become a world player we have to provide leading edge technology.

Our competitive advantage is based on innovative products.

Aspects like Globalization, product life cycles, competing and substitute products ,push/pull effects from large customers ,play an enormous strategic role.

My company strategy is driven by innovation and the constant thirst for more and better.

Not strongly entrenched.

We do not have a strategy

The strategy of having no strategy relies on innovation.

Not currently.

The company has a culture of innovation.

Innovations are converted to strategy for planning and then implementation.

The strategy of the company is driven by innovation.

We are now focused on delivery - innovation is not a key driver any more.

To have and maintain a competitive advantage continuous innovation is required.

Rather the culture.

Our vision encompasses providing our clients with innovative solutions.

In line with Balanced Scorecard.

We tend to focus on the existing projects that will create revenue in the short term. Long term innovation therefore takes the back seat.

No, the strategy is driven by the company's innovation that leads to the creation of new products ,ideas etc.

Q17. Sustainable competitive advantage is based on the continuous ability of my company to innovate					
	I	II	III	IV	V
	42%	35%	17%	6%	0%
	(22)	(18)	(9)	(3)	(0)
Total Respondents 52					

Q18. Sustainable competitive advantage is based on the continuous ability of my company to innovate: (29 responses)

Ideas are endless by their very nature. Having new ideas means your growth and achievement are endless.
Not generally but can be in instances.
Highly competitive market.
As a new world trend becomes popular so we need to be able to change and innovate around it.
New products equals increased revenues.
Innovators are leaders in each industry.
Failure to innovate results in a downward trend.
Our competitive advantage is to be achieved by being the lowest cost quality producer in our industry though investment in efficient capital equipment.
Generating new product offerings is where our core strength lies.
Innovation needs to take place continuously throughout our organization.
Our sustainable competitive advantage lies elsewhere.
It is one of the few remaining sources of competitive advantage.
We understand that products have a useful life cycle and that there is a rapid decline from product speciality with high margins to commodity products with low margins.
We are continuously looking at ways to make things ' Simpler Better Faster'.
This is proportional to your financial sustainability and support from government, clients and partners.

In order to stay ahead of the competition yes we must innovate.

Once a reputation has been developed, the need to innovate is not as important.

In a highly competitive industry, innovation allows for the company to be differentiated from competitors.

Innovation is ongoing for us, we have no choice.

Yes, we are always aiming to become more innovative.

We're in a rapidly moving world and industry and this is paramount to long term survival.

Consumers are faced with increasing choice, we have to innovate to stay competitive.

To be flexible and to realize that being successful today is no guarantee to be so tomorrow.

New products differentiate us from our competition.

No innovation, no growth! It is that simple.

It is not business as usual as the demands of clients grow by the day and what was the flavour of the day a week ago, is stale the next week.

Especially because we are in the consulting environment.

To compete with the major overseas first tier Suppliers we have to become the leader in certain selected technologies.

Strident factors affecting the company's competitiveness are complex and varied.

In the absence of continuous change and adaptation to market forces ,the company will eventually succumb.

Q19. My company has access to the latest information relevant to our business	I	II	III	IV	V
	29%	**46%**	19%	6%	0%
	(15)	**(24)**	(10)	(3)	(0)
					Total Respondents 52

Q20. My company has access to the latest information relative to our business, please explain: (28 responses)

We are in the forefront of changing the way our industry operates. The latest information that the industry has, comes from our thinking and innovative ideas.

Journals, publications etc.

Internet and good library.

We are very aware of trends and product relevant to our business.

Much more information is available than previously however this reduces the barriers to entry for new entrants.

We have strong global R&D facilities.

We rely largely on our outsource partners to keep us advised.

We have our own library, subscribe to a multitude of relevant journals and newspapers, and invite keynote speakers.

We get information from the industry by subscribing to various forms of media.

Sometimes, when required.

We have partnered with experts in the field.

More information would always be better.

Use the internet.

Firm has adjusted with new knowledge eg: competition law

We continuously research educational products revolving around cell phones and the internet .

We are highly experienced in what we do and have stayed informed.

Our business concept is based on recent research.

We are at the cutting edge of using technology to revolutionize the entertainment industry and research keeps us up to date.

We identify problems and come up with solutions, not necessarily based on available industry knowledge.

We have been able to customize solutions due to our R&D in the sectors we deliver services to.

We have managed to design and produce very innovative products over the years due to staying abreast of new knowledge

Through media.

Read relevant articles.

I do a lot of continuous research, burning midnight oil.

We use the Internet extensively and staff are encouraged to attend courses, read and conceptualize solutions.

Magazines, articles, web sites, papers, etc.

We do subscribe to various research databases.

Communications technology forms the backbone of our business enabling the company to apply e-business, internet project communication systems, and internet access to latest info.

Q21. My company uses state of the art information technology systems to develop new products	I	II	III	IV	V
	21% (11)	25% (13)	**35% (18)**	17% (9)	2% (1)
Total Respondents 52					

Q22. My company uses state of the art information technology systems to develop new products, please explain: (30 responses)

We use our minds to develop new products and the technology to easily apply them to the technologically aware market.

Have good IT but not for new products.

Manufacturing - capital equipment intensive.

We have all the latest facilities at our R&D facilities.

We do not.

We do make use of available technology, but our expertise and interest rather and is related to funds.

Not state of the art.

We are using old methods to produce new products.

Time, effort and a bit of luck is the best solution we have so far.

We use functional tools that assist us but not state of the art.

'cigarette box' design is very effective.

Clients spend millions on IT Infrastructure so our solutions need to be able to integrate seamlessly with them.

There are aspects of it, especially in terms of technology developments (software).

Have invested in design tools and have access to major research databases.

Our company falls under the 'user of technology ' category .In the course of its application additional technology is applied where necessary for purpose built systems.

Technology definitely plays a role in materializing what you imagine.

No, thinking creatively, out the box.

It is personnel, have good IT in place.

As an IT company all our products revolve around and are dependant on IT.

Information technology applied correct can assist in reducing costs by making staff more efficient. Applied incorrectly and it is purely a waste of money.

Information is a competitive advantage and the speed of information and technology transfer to the marketplace is crucial to maintain the competitive advantage that we have.

We try to be right at the forefront of technology all the time.

It does facilitate innovation, but innovation is not strictly dependant on it.

Yes

Based more on emotional interaction and communication.

It's dependant on time more than technology - especially as we're a technology company.

We are in the encryption game and new ideas have to be accommodated all the time.

The base of our product/service is IT.

We are an ICT Company so IT, it goes without saying, is important.

Technology enables the innovative idea - it does not drive the solution.

Information technology plays a role in the commercialization phase rather than innovativeness phase.

Q23. The industry within which my company competes is highly competitive					
	I	II	III	IV	V
	42%	39%	19%	0%	0%
	(22)	(20)	(10)	(0)	(0)
Total Respondents 52					

Q24. The industry within which my company competes is highly competitive, please explain: (31 responses)

Constantly thinking of new ideas means we recognize that competition is stiff.

Many operators.

Yes, highly competitive.

Pricing is everything.

It is a very specialized industry and hence competition is limited.

Survival of the fittest, we believe in being a quick moving target.

Globalization has made our industry highly competitive.

My competitors are listed companies and have greater resources than we do and we survive by being an efficient producer.

Competition is increasing annually.

We have a large multi national global competitor and many local competitors who have a quick response time.

We have many competitors.

There are a number of players in this field so pricing is important.

Banking sector – competitive.

Defence industry, limited amounts of work, price sensitive, highly skilled and capital intensive.

We are in a struggle for market share.

Margins are shrinking due to increased competition.

Threat of competition from foreign players.

A number of competitors, price is an issue.

New competitors enter the industry all the time.

Highly saturated industry.

It is still in it's infancy but will no doubt become so.

Competition is increasing from imports from China.

Multinationals often compete directly with their own agents & distributors.

I anticipate that it will only become more competitive.

We cannot ever rest on our laurels.

The changing face of IT happens daily.

Fierce competition is what characterizes most industries today.

Consulting is competitive.

We are competing with major overseas multinationals that are a thousand times our size.

Strong and well established foreign competitors exist.

International multinationals dominate our industry , and are developers of technology .we mention the likes of Siemens ,ABB, Alstom.

Q25. Demographics influence my company's decisions to develop new products					
	I	**II**	**III**	**IV**	**V**
	12%	19%	**33%**	27%	10%
	(6)	(10)	**(17)**	(14)	(5)
Total Respondents 52					

Q26. Demographics influence my company's decisions to develop new products, please explain: (20 responses)

There is an emerging strong black market hence we are finding ways of attracting them too.

Our major markets are the developed and developing countries where health and hygiene are important or becoming important. Higher populations equates to more potential for our products and services .

Ignore demographics at your own peril, we have learnt this lesson.

We first conduct market research before proceeding with the development phase.

We do not, only to a very limited extent.

Retail in rural areas has benefited from innovations such as mini-ATMs.

We have targeted higher income people.

A thorough understanding of our market is key.

Our services are not related to demographics. Should this be important with a certain innovation we will take it into consideration.

South Africa has enormous demographic variations which have to be considered.

We only develop products based on market requirements.

Demographics are a key determinant of new product development for us.

Our marketing department has a very thorough understanding of our consumers.

Products developed by us are tailor-made for each market they are destined for.

Consumers demand more state of the art solutions to address their specific needs and our clients need to retain and attract new consumers.

Only the size and number of available engineers.

We segment our market.

One of main focus is that of developing products suitable for African conditions.

We believe in strong product knowledge and hire team members specializing in certain areas. This makes it easy to gauge the market reactions for a new product.

Test sites are constantly set up and monitored for market response.

Q27. My company knows exactly what its customers want and need	I	II	III	IV	V
	19%	**56%**	21%	4%	0%
	(10)	**(29)**	(11)	(2)	(0)
					Total Respondents 52

Q28. My company knows exactly what its customers want and need, please explain: (20 responses)

Our label reads "auctioneers", however our business is customer assistance. We get in their shoes and assist them to sell their properties by public auction.

We make use of profiling and interviews.

Good Data analysis gives us these answers.

In an ever changing market our clients needs change constantly but we keep astride of this.

Customers want a quality product at a competitive price.

We know exactly who our customers are and we know what there needs are.

This is a function of our existence.

'Exactly' is too exclusive a word. Not even customers know exactly what they need.

We do not conduct in depth customer research.

Daily interaction with our customers.

We have to keep a sharp eye on clients to understand their ongoing requirements.

We work very closely with our customers in developing solutions.

Reliability, availability, maintainability, cost, least downtime, productivity, value.

We try our best, but don't always succeed.

We have a frank and open relationship with our clients and regular sessions are convened between ourselves and our clients.

Frequent client satisfaction surveys, and good relationship management.

Due to contact with our customers we have a good understanding plus we monitor market trends.

Our approach has been very client driven – our clients first test a beta product for feedback.

Again ,whereas information and communications systems are in place ,the nature of our business is such that it only requires temporal analysis.

The 5 new systems we have put in place have been due to listening to our customers.

Q29. New products have a short lifespan in our industry					
	I	**II**	**III**	**IV**	**V**
	4% (2)	23% (12)	**42%** **(22)**	25% (13)	6% (3)
					Total Respondents 52

Q30. New products have a short lifespan in our industry, please explain:(30 responses)

Innovation and new ideas are continuously representing a shorter lifespan for previous ideas.
Depends on product.
Although we change products frequently, the lifespan is getting shorter.
The barriers of entry into our markets is not high and our competitors are quick to follow any successful new product introduction.
The old standards go on forever. New products come and go.
Depends, but life-cycles tending to get shorter.
The defence industry expects long lifecycles for products.
Some do, some don't.
Innovation costs money, so the longer the lifecycle the better.
Young industry still developing.
Depends on which part of the value chain you operate in.
Products, if well maintained often have a operational life in excess of 10 years.
The true potential of a solution is only as good as the use it is to the client. As consumer needs changed so our clients need to stay abreast.
Some technologies remain in industries for relative long periods.
Basic vehicle platforms tend to stay for 5 to 8 years.
MV and HV electrical equipment have a lifecycle of 20 -25 years on average

Q31. Interaction with the external environment of my company is an important source of innovation					
	I	**II**	**III**	**IV**	**V**
	23%	**40%**	25%	10%	2%
	(12)	**(21)**	(13)	(5)	(1)
					Total Respondents 52

Q32. Interaction with the external environment is an important source of innovation for my company, please explain: (22 responses)

We interact with our market on a daily basis.

Interaction with our customers and technology resource institutes is most important.

Consultants can be considered external sources of innovation.

It is necessary in order to stay ahead.

Need to keep up with what customers want.

Products need to operate in various demanding environments. We thus have to often modify products to be able to work in other environments.

It is good to know what others are doing but it never restricts us to following the same path.

Consulting services are important for this.

One can not innovate in a vacuum. Test sites are constantly set up and monitored for market response.

Through quality assurance within our customer base.

New products are introduced by our Product Development Manager who tests markets for all new products before they are released to the sales teams.

We are constantly monitoring our competitor's products and pricing.

We need to know market share.

We do.

We watch our customers to see if we on the right track.

We try and get as much customer feedback as possible.

One always needs to know what the competition is doing.

Market awareness is important.

Very little because of the nature of the market (automotive).

We make it our business to continuously sonar the market.

We use psychologists to get an idea of how the minds of the market work at different times.

Q33. My company has an extensive network of external collaborators who assist us in developing new products	I	II	III	IV	V
	12%	**42%**	23%	19%	4%
	(6)	**(22)**	(12)	(10)	(2)
				Total Respondents 52	

Q34. My company has an extensive network of external collaborators who assist us in developing new products, please explain: (23 responses)

Two heads are better than one.

Yes but not extensively.

We do most of our own chemical product R&D but we work closely with application equipment manufacturers.

We don't.

Not a fixed list of collaborators.

From time to time.

Our customers.

I make use of a host of people to help with ideas.

We outsource certain aspects of our product development to trusted suppliers.

The business of our company is largely dependant on outside networks.

We are very reliant on changes in the cell phone industry as well as the internet and therefore rely heavily on outside networks.

We maintain strong links with technology resource institutes and with OEM manufacturers (original equipment manufacturers).

New products cannot be developed in isolation.

We have to be aware of what our competitors are doing and rely on outside networks.

Consultant networks.

Our fabric manufacturers play a part in innovation.

By good networking the same solutions can be used in a similar environment without much tweaking.

We often bring in outside skills to assist us.

Our networks save development time and show a better return on our investment.

Our Engineers attend seminars and conventions all over the world.

We are apologists of the outsourcing principle to effectively and competitively achieve our development targets.

We collaborate with industry leaders but a specific focus of this collaboration is always that there must be a clearly defined skills transfer process.

Siemens AG and local based expertise.

Q35. My company actively seeks out new partnerships					
	I	**II**	**III**	**IV**	**V**
	27%	**48%**	17%	8%	0%
	(14)	**(25)**	(9)	(4)	(0)
					Total Respondents 52

Q36. My company actively seeks out new partnerships, please explain: (20 responses)

New partnerships and their ideas help us to stay ahead of the competition.
Networking provides access to new markets.
BEE partners, but not partners for new products.
We are constantly getting into partnerships who play a role in promoting our products.
NB to consider sourcing options.
We are always looking for new technology.
We don't.
New innovation projects are sent to tender even if existing relationships can offer the services. We have to see what else is out there.
New knowledge partners are actively pursued.
To comply with the latest government requirements and to establish value added links.
Good way to grow without requiring capital.
We believe in skills transfer with international partners.
We have very a unique business and propositions are regularly made by potential partners.
We are constantly seeking partners in our own and external industries for access to information.
Reseller network.
It depends on the needs but generally no.

Although this an excellent concept, in practice it doesn't often happen.

By working with others we grow.

We enter into technology partnerships with leading overseas first tier design houses.

Our strategy makes provision for associations with black empowered and international enterprises looking to develop an engineering and/or a project business competence centre.

Q37. My company is not afraid to take risks	I	II	III	IV	V
	21%	**40%**	19%	13%	6%
	(11)	**(21)**	(10)	(7)	(3)
					Total Respondents 52

Q38. My company is not afraid to take risks, please explain: (33 responses)

We have volumes of failures, however our successes are bigger than our failures.

Tends towards risk aversion generally.

Conservative partners.

Risks are an integral part of our progress.

Risk averse profile.

Internationally we do take risks in new R&D projects.

If we see opportunity we will take the risk.

Banks don't take enough risk.

Taking risks is how we have survived for 15 years.

We thrive on risk.

It is not business as usual. This phrase captures our approach to risk.

Calculated risks.

We never over analyze an opportunity, if we feel confident we go for it.

We are generally risk averse.

Although we consider all new concepts, some are rejected on the basis of unacceptable risk.

Taking risks keeps everyone stimulated.

No such thing as a bad decision - means people are at least thinking and interested.

We have had some failures due to bad ideas or bad decisions.

We take risks but make sure we are meticulous in their execution.

As long as more good ideas than bad ideas, we make money.

We would not survive if we did not take risks.

We take risks where the rewards are appropriate.

How will you know bad from good if you don't take risks.

We have many ideas - most are never implemented, because they are too risky.

We are a gutsy player in our industry.

Some risks taken have made us money, some have lost us money.

Risk taking has led to some major and ground breaking solutions within the ICT sector.

New ventures are discussed in a collaborative manner to ensure all risks and obstacles are identified.

We have had many failures, but even greater successes.

We have taken some unnecessary risks. From these we have learnt a great deal.

We abide by the notion of 'nothing ventured, nothing gained '.

Prepared to risk entering into new technologies.

Whereas the company is not adverse to risk taking ,the directors, as guardians of the company's assets, have a duty to ensure their proper use and protection and are required to apply risk mitigation.

Q39. Good leadership is an important factor in stimulating innovation within my company					
	I	**II**	**III**	**IV**	**V**
	31%	**52%**	17%	0%	0%
	(16)	**(27)**	(9)	(0)	(0)
Total Respondents 52					

Q40. Good leadership is an important factor in stimulating innovation within my company, please explain: (23 responses)

As part of management we believe in hiring people more intelligent than us and giving them carte blanche in what they do.

Leaders will determine the culture of innovation.

Leadership should encourage, not curtail innovation.

Need to be motivated to all.

An important function of a leader is idea generation.

Maybe in others, but not necessarily in mine.

Bad leadership inhibits all stimulation or innovation.

Agree.

Need to given room or process to innovate.

Agree with the statement however does not happen within our company.

Guidance needs to be provided by leaders.

Leadership should encourage innovation.

Bureaucracy stifles innovation.

Strong leadership has been a vital success factor in our business.

You need to provide the framework and comfort levels to allow innovation.

People need to be empowered and allowed to make mistakes.

A framework for innovation needs to be provided by a leader.

Good leaders are strategically positioned in throughout the business.

Leadership is essential to unlocking creativity amongst staff members.

Getting people to do things they would otherwise not do requires good leadership.

More culture - created by the leaders.

Need top management to drive .

Management to be self-critical. The leaders must be capable of recognizing and accepting their mistakes and learning from them.

Q41. My company is effective in learning from its mistakes	I	II	III	IV	V
	21%	**62%**	15%	2%	0%
	(11)	**(32)**	(8)	(1)	(0)
					Total Respondents 52

Q42. My company is effective in learning from its mistakes, please explain: (20 responses)

That is the only way to learn.

Experiences shared and bad ones avoided at all costs.

Have to.

It is a critical part of the learning organization.

Mistakes cost money and we do not like losing money so we learn quickly when we lose money.

When mistakes are made we try and analyze the reasons.

We try hard not to make the same mistakes twice and we communicate our failure (and our successes).

We learn faster when it costs us money.

We have made many mistakes and are still around!

If we don't we do not survive.

No company can avoid them.

Solutions that are successful and failures are communicated with everyone in the organization.

A lot can be learnt from mistakes.

There is always a monetary value attached to mistakes.

Try, but don't always succeed.

Mistakes are unavoidable, repeating them is.

As an ISO 9001 compliant company we learn from our experiences as it informs the way in which we will deal with a similar situation in the future.

Have frequent phase reviews and reflect on projects, actions, etc.

Have failure review meetings and do design and process FMEA's

We are strong protagonists of the notion that mistakes are committed in pursuance of the company's objectives and that in itself provides the foundations of future decisions and strategies.

Q43. Innovation is driven by a specific individual in my company					
	I	**II**	**III**	**IV**	**V**
	10%	**33%**	29%	23%	6%
	(5)	**(17)**	(15)	(12)	(3)
					Total Respondents 52

Q44. Innovation is driven by a specific individual in my company, please explain: (17 responses)

As management we all support innovation.
The leader.
The 3 partners.
We all play a part in innovation.
Despite our efforts to empower everyone, top management drives innovation.
Consultant.
Must be strongly supported and encouraged from the top but must be at all levels.
Yes me.
One of us is more driven by innovation.
Me.
Most top management are part of the innovation process.
Most have a role to play.
I am the driver. The staff have learned to innovate naturally.
Driven by a team.
Top management.
Everyone is involved.
Innovativeness is cultural not individual.

Q45. My company is capable of effective communication externally					
	I	II	III	IV	V
	13%	**52%**	21%	13%	0%
	(7)	**(27)**	(11)	(7)	(0)
Total Respondents 52					

Q46. My company is capable of effective communication externally, please explain: (16 responses)

We communicate with our clients all the time.
Media is to expensive.
Our partnerships are usually responsible for outside communications.
We spend a great deal of money on this.
I believe we are - we have invested in the technology to allow us to effectively communicate with our clients.
Communication skills are one of our core strengths.
It is important to us to generate as much possible interest in our company from the outside.
All outside stakeholders are kept up to date with internal developments.
We have strong ongoing relationships with our customers and we have good trade associations.
Latest IT.
Communication takes place on various platforms eg internet, press releases, advertising.
Mostly.
Through e-mail correspondence, also using auto-responders.
Try - but don't succeed. The market often only hears what they want to.
Viable website.
We apply e-business, internet ,publications and promotions, communication systems externally.

Q47. My company employs the best people available in our industry	I	II	III	IV	V
	15%	33%	**40%**	10%	2%
	(8)	(17)	**(21)**	(5)	(1)
					Total Respondents 52

Q48. My company employs the best people available in our industry, please explain: (27 responses)

We still make mistakes, we still let people go, other people still cost us money.
Insufficient resources and draw cards.
Best professionals, not support staff .
We employ the best people we can afford.
Some of the best. Often less expensive to pay more and get the best as cheaper in the long term, but very expensive if you make a mistake in the person you employ.
We have very good selection criteria and we use outside consultants to minimize errors.
Some good some bad.
That is our competitive advantage.
Costs are always a constraint -certainly the best people at the level.
Cannot compete with the large company benefits and pay packages.
We have a lot of respect for other companies and people.
One needs the best people and to keep them at that level.
Strict recruitment policy.
Yes, although this is difficult due to limited resources.
"The recruitment of suitably qualified Engineering, Marketing, Administration and Production professionals."
We strive to get the right people into the business and also the right people in the

right seats.

Hands on evaluation of each new recruit.

We research the availability of skills as best we can.

We have a very good Individual Development Plan for each of our employees that encourages talent development to ensure that we have the best.

Each person is a specialist, recruiting them is difficult.

Bonuses play a big part in our remuneration and encourages people to join us who are willing to utilize their talents.

We are each there for our expertise in a particular area.

Being small we have to, but it is difficult to compete with big company benefits.

People have natural abilities and competencies, we try and get people that are naturally good and will thus more likely have a passion for what they do.

Trying to but don't always succeed.

No.

We are a results-oriented company. The focus is on substance versus form, quality versus quantity.

Q49. My company is comprised of people from diverse backgrounds	I	II	III	IV	V
	21%	**60%**	19%	0%	0%
	(11)	**(31)**	(10)	(0)	(0)
Total Respondents 52					

Q50. My company is comprised of people from diverse backgrounds, please explain: (16 responses)

Diverse in terms of sex, age, academic qualifications and specialities.

Yes, very diverse.

We have a big mix of race and culture within our organization.

It is company policy.

People from different backgrounds have different ideas.

We employ based on merit, not background or other unrelated issues.

Diversity gives us a competitive advantage.

Not as diverse as we should be but working on improving.

Diversity stimulates creativity in our company.

South Africa is characterized by diversity.

Our company is very diverse on various levels including race, gender, religion, education and culture.

Plenty of diversity.

In SA everyone has diverse backgrounds.

Diversity is our strength.

We have graduates to matriculants working in the company. Diverse cultural backgrounds.

Employment barriers, preventing persons from the designated groups from progressing within the group, will be identified and eliminated. The company endorses equal dignity and respect of all people.

Q51. My company has a flexible organizational structure and is able to react quickly to change					
	I	**II**	**III**	**IV**	**V**
	31%	**48%**	10%	8%	4%
	(16)	**(25)**	(5)	(4)	(2)
Total Respondents 52					

Q52. My company has a flexible organizational structure and is able to react quickly to change, please explain: (25 responses)

We are obsessed with titles and positions.
Mainly due to small size.
Partners inflexible / conservative.
We often move people into roles that suit them best for that particular project.
Small management and sales team.
We can change to suit requirements.
We move fast when we have to.
New divisions pop up to capitalize on industry growth areas.
We do what is required for each project.
We realize the importance, but don't always succeed.
We are small and fast moving.
We have a flat HR structure.
A combined process based matrix organizational structure provides the necessary flexibility to rapidly react to changes. The roles of the team members and the company has changed drastically over the past 3 years.
Only talk.
Find that change for the sake of change is one of the bigger mistakes companies make. If it aint broke - dont fix it.
We are continually looking at new improved ways of doing things.
Agree.

If things don't change, I change things so that no one becomes complacent.

Not very.

Flexibility is key to survival.

Without change it would be business as usual, we have to be prepared at all times for change.

In certain areas we are more flexible than others.

We have shifted our entire model from only technology development through to providing relevant services around our technology, this has forced us to be flexible.

We continually adapt and or change, be it structurally or in the way we do things to best meet market requirements

Q53. Experts within my company regularly hold brainstorming sessions to come up with ideas for new products	I	II	III	IV	V
	17%	**46%**	23%	8%	6%
	(9)	**(24)**	(12)	(4)	(3)
Total Respondents 52					

Q54. Experts within my company regularly hold brainstorming sessions to come up with ideas for new products, please explain: (16 responses)

This happens weekly.
1 or 2 times a year.
We hold weekly meetings where everyone is encouraged to come up with a few ideas.
We have regular product development meetings.
When we have to, we do.
Not necessary - when an issue arises we discuss it.
Not necessary to hold brain storming sessions.
We are always thinking of new ideas.
We have constant contact with our overseas technology resources and we hold monthly technology transfer meetings with all divisions.
Our R+D people do.
I meet with my technical team weekly.
Not scheduled sessions, but yes.
Does depend on the division and leader.
Everything in the company is transparent, thus staff are well informed. Staff are regularly prompted for their input & ideas.
Weekly sessions are planned, as well as informal buzz sessions.
During regular meetings new ideas and concepts are discussed at all levels.

Q55. Effective communication within my company is important in facilitating innovation					
	I	**II**	**III**	**IV**	**V**
	33%	**46%**	21%	0%	0%
	(17)	**(24)**	(11)	(0)	(0)
					Total Respondents 52

Q56. Effective communication within my company is important for facilitating innovation, please explain: (15 responses)

We pick each others brains all the time.
Ideas breed ideas.
Need more communication.
Effective communication is necessary for everything to work.
We have an open door policy.
I try to spend as much time with my staff as possible.
People at all levels in the company need to know.
Agree.
Always the case.
Our intranet plays an important role in this.
Often people that have no expertise in a certain field come up with innovation as they look at things from a different perspective.
We have a flat organizational structure which encourages effective communication.
The channels of communication are always open whether upward or downward.
To ensure that market requirements are adequately communicated to technical staff.
Processing of ideas and concepts requires an effective formal and informal communication network.

Q57. My company is continuously launching new products					
	I	**II**	**III**	**IV**	**V**
	21%	**38%**	23%	15%	2%
	(11)	**(20)**	(12)	(8)	(1)
					Total Respondents 52

Q58. My company is continuously launching new products, please explain: (19 responses)

We are constantly thinking about new products for our industry.

As the market trends change, so we launch a new products.

Capital intensive products are launched often.

Several new products are launched every month.

We don’t.

One per week.

Every 6 months or so.

We do what we have to, to survive, often ideas are only logged so that they can be developed as we get the resources to do so.

We need to retain our client base and grow it. Hence we need to develop new solutions.

New projects, but not new products.

Almost quarterly.

It is the nature of our products.

No.

We are continuously ploughing a lot of money into designing and developing new ideas.

Only when defined opportunities are recognized.

We do not.

We are currently in the process of launching two major new products.

It doesn't, but it should.

We build new features into our software at substantial cost continuously. Within limits of cash flow most of our re-investment is into innovation.

Q59. New products form an important part of the income of my company					
	I	**II**	**III**	**IV**	**V**
	13%	**38%**	31%	13%	4%
	(7)	**(20)**	(16)	(7)	(2)
Total Respondents 52					

Q60. New products form an important part of the income of my company, please explain: (15 responses)

Only current services / products.

New products have higher profit margins.

Agree.

Not always.

We realize the importance of new product generation.

New products have always had a significant impact on our bottom line.

It is a double edged sword, as new products require substantial investment before returns are felt.

We are currently very slow at turning out new products.

New products equals higher turnover.

It forms the bulk of our income.

We have to stay with market, new products are key to our survival.

It could be more.

Not always.

75%.

Long life cycles of our products, but substantial income is derived from these.

Q61. My company has a state of the art research and development department					
	I	**II**	**III**	**IV**	**V**
	6%	13%	31%	**37%**	13%
	(3)	(7)	(16)	**(19)**	(7)
					Total Respondents 52

Q62. My company has a state of the art research and development department, please explain: (16 responses)

No R&D.

One employee.

We have large modern R&D facilities in the USA and Germany backed up by regional product development and marketing departments that interface with local customers.

Not relevant to my company.

As a small company we do not have a development department, but rather all get involved in development.

Major R&D centre in the UK.

It doesn't.

Not a dept *per se.*

We dont have a R+D department.

Cannot afford it.

On our wish list.

To retain our competitive edge we need to stay a few steps ahead of the competition. R&D is thus a critical success factor to our company.

Fair budget allocation and major support from the Board.

This is where most of our turnover is spent - developer salaries.

We have persons throughout the company who do R&D as all staff are encouraged to do so.

Good staff, adequate resources - basically good enough but not over the top.

As users of technology, not necessary.

Q63. My company is passionate about innovation					
	I	**II**	**III**	**IV**	**V**
	40%	33%	17%	10%	0%
	(21)	(17)	(9)	(5)	(0)
Total Respondents 52					

Q64. My company is passionate about innovation, please explain:(23 responses)

It gives us the urge to be the best we can.

The company has its moments.

It is not entrenched – more talk.

We thrive on change and innovation.

100% of revenues come from products that are less than 5 years old.

Its not.

Byline: traditional values, innovative ideas.

We pride ourselves on being different.

We are passionate about our offerings - that include quality.

Creativity and innovation are encouraged.

The goal posts are always shifting probably always will. To be part of the game we need to stay abreast and keep focus on innovation.

Sustainability and continuous growth is of core importance.

When dealing in the IT industry you are always forced to focus on innovation.

We differentiate ourselves through our innovative abilities

We love what we do and the products we develop - this is why we are able to attract top staff with minimal resources/lower salaries.

At all levels new challenges are important .

Innovation knows no boundaries in my company.

Continuous improvement is expected in everything that we do.

It is rewarded.

Incentives are given to innovators. Complacency is not tolerated. Only thing we can rely on is that things will change.
Culture across new projects and processes.
All staff are able to log ideas and opportunities for innovation.
We are living at a time of great and rapid change in the global environment. Marqott agrees that globalization is inevitable and that it can be a strident force in company growth and wealth development.

5. Interpretation of Results

5.1 Introduction

The data gathered by means of the questionnaire rendered some interesting results. Firstly the questionnaire itself will be analysed in terms of the responses to the Likert scale questions in addition to the responses to the open ended questions and thereafter the results of the factor analysis will be examined.

5.2 The questionnaire

Q1. Number of Employees

The majority of the respondents, 34 in total, have less than 50 employees.

Q2. Turnover

Half of the respondent companies have a turnover of less than R 10 000 000 per annum, and half have a turnover in excess of this amount.

Q3. Type of Industry

The respondent companies are from a wide range of diverse industries, including both service and manufacturing companies. The most prevalent industry is the IT and ICT industry, with 11 respondents belonging to this category.

Q4. Position Held

All of the respondents hold senior managerial positions in their companies and 35 of the respondents are company directors. 15 of the directors are either CEO's or managing directors.

Q5. Number of Years in Existence

The mean number of years in existence is 13 years, with the oldest respondent company having been in existence for 75 years and two respondent companies having been in existence for 1 year only.

Q6. City/ Town

28 of the respondent's companies are situated in Johannesburg, 4 in Cape Town, 6 in Durban, 4 in Pretoria and 1 in Pietermaritzburg. 6 have offices on a national basis, 3 have offices in both Cape Town and Johannesburg and 1 has offices in both Durban and Johannesburg.

Q7. My company has a set procedure for managing innovation

The majority of respondents neither agree nor disagree with this statement.

Q8. My company has a set procedure for managing innovation, please explain

The qualitative responses to this question were almost evenly divided with 21 respondents agreeing that they have a set procedure in place for managing innovation and 19 respondents disagreeing with this statement. Interestingly several respondents that disagreed felt that innovation should be entrenched in the culture of the company as opposed to the implementation of a set procedure. These comments included *"We support free flow of ideas/imagination/thinking…" , "This does not need to be a formal set of procedures but rather a culture", "A company culture that encourages new and different ideas needs to be cultivated and entrenched into all team players", "Employing innovating people is more important than procedures", "Innovation is not a procedure but a mindset"* and *"In innovation lies the soul and heart of the company".*

Q9. My company has the ability to quickly design, develop and launch new products

The majority, namely 17 respondents strongly agree with this statement.

Q10. My company has the ability to quickly design, develop and launch new products, please explain:

Only 5 of the 35 qualitative responses indicated an inability to quickly design, develop and launch new products. Reasons included *"Company not innovatively orientated", "Law is a personal skill that does not allow practice in new fields overnight", "We produce industry standard products. Not much innovation required only the capital equipment, working capital and experience", "Uncompetitive partners hamper us in this regard"* and *" This ability exists, but does not take place because there is no internal environment for this to take place".* The majority of positive responses focused on the importance of keeping the time to launch as short as possible.

Q11. Government supports innovation within companies in South Africa

The majority of respondents neither agree nor disagree with this statement.

Q12. Government supports innovation within companies, please explain

Of the 44 responses 14 agreed that government supports innovation within companies. It is apparent from the responses though that there is a lack of clarity with regard to the scope of support which government currently provides. Mention was made of DTI loans, SETA initiatives, Foreign Trading Policy, SPii grants, tax breaks and patent protection. Government could perhaps provide companies with a framework which clearly delineates the extent and nature of the various incentive schemes it has in place together with guidelines on how companies can access these.

Q13. My company has approached a government department for assistance with innovation

The majority of respondents neither agree nor disagree with this statement.

Q14. My company has approached a government department for assistance with innovation

14 of the 27 responses affirm that government departments have been approached for assistance with innovation. Amongst those companies that have, several indicated that they were frustrated with the process and their comments included *"…the paperwork makes it difficult for small companies", "Have tried to work through DTI to no effect", "We are tired of asking for support from our government…", "Too much paperwork"* and *"They wasted our time and messed us around".*

Q15. Innovation is a key strategic issue in my company

20 respondents agree strongly and 20 respondents agree with this statement.

Q16. Innovation is a key strategic issue in my company, please explain

It is clear from the responses that innovation is an overwhelmingly important strategic issue and is driven by market forces. Responses included *"market changes very quickly", "We must be innovative to stay ahead of the competition and to make speciality products not commodities", "If not offering latest products, margin is low, then ROE suffers…""The world is changing every day", "We are in a saturated industry and the only way we will survive is through innovation", "Innovation is needed in order to maintain competitive advantage", "…Clients want/ need new and creative solutions", "Our competitive advantage is based on innovative products", "Aspects like Globalization, product life cycles, competing and substitute products, push/ pull effects from large customers, play an enormous strategic role"* and *"To have and maintain a competitive advantage continuous innovation is required".*

Q17. Sustainable competitive advantage is based on the continuous ability of my company to innovate

The majority of respondents agree strongly with this statement.

Q18. Sustainable competitive advantage is based on the continuous ability of my company to innovate

Several respondent's pointed to the inevitability of innovating in order to compete and their responses included *"New products equals increased revenues", "Innovators are leaders in each industry " "Failure to innovate results in a downward trend ", "Generating new product offerings is where our core strength lies ", "It is one of the few remaining sources of competitive advantage ", "...there is a rapid decline from product speciality with high margins to commodity products with low margins ", "Innovation is ongoing for us, we have no choice", "New products differentiate us from our competition" and "No innovation, no growth! It is that simple".*

Q19. My company has access to the latest information relevant to our business

The majority of respondents agree with this statement.

Q20. My company has access to the latest information relative to our business, please explain

Various different sources are consulted in accessing information, and the responses included mention of journals, publications, the internet, libraries, media, articles, magazines and research databases.

Q21. My company uses state of the art information technology systems to develop new products

The majority of respondents neither agree nor disagree with this statement.

Q22. My company uses state of the art information technology systems to develop new products, please explain

From the responses to this question it appears that although information technology systems do play a role throughout the process of developing new products, several respondents indicated that information technology systems are not employed in the creative phase of innovation, but are rather employed in the process of getting new products to market. Responses included "*We use our minds to develop new products and the technology to easily apply them…", "We have good IT but not for new products", "cigarette box design is very effective", "No think creatively, out of the box", "It does facilitate innovation, but innovation is not strictly dependant on it", "Based more on emotional interaction and communication", "Technology enables the innovative idea – it does not drive the solution"* and "*Information technology plays a role in the commercialization phase rather than the innovativeness phase*".

Q23. The industry within which my company competes is highly competitive

The majority of respondents agree strongly with this statement.

Q24. The industry within which my company competes is highly competitive, please explain

Several respondents indicated that foreign competitors are increasing the level of competition within their respective industries. Responses included "*Globalization has made our industry highly competitive*", "*We have a large multi national global competitor*", "*Threat of competition from foreign players*", "*Competition is increasing from imports from China*", "*Multinationals often compete directly with their own agents & distributors*", "*We are competing with major overseas multinationals…*", "*Strong and well established foreign competitors exist*" and "*International multinationals dominate our industry…*". It is furthermore apparent that the effects of globalization are being felt on local industries.

Q25. Demographics influence my company's decisions to develop new products

The majority of respondents neither agree nor disagree with this statement.

Q26. Demographics influence my company's decisions to develop new products, please explain

The responses to this question point to the importance of conducting market research. The market orientation of these respondents is also evident. Responses include "*We first conduct market research before proceeding with the development phase*", "*A thorough understanding of our market is key*", "*We only develop products based on market requirements*", "*Demographics are a key determinant of new product development for us*", "*Our marketing department has a very thorough understanding of our consumers*", "*Products developed by us are tailor-made for each market they are destined for*", "*Consumers demand* *more state of the art solutions to address their specific needs…*”, “*We segment our market*” and “*Test sites are constantly set up and monitored for market response*”.

Q27. My company knows exactly what its customers want and need

The majority of respondents agree with this statement.

Q28. My company knows exactly what its customers want and need, please explain

The importance of client interaction in knowing what customers want and need is clear from responses including “*…we get in their shoes*”, “*We make use of profiling and interviews*”, “*Daily interaction with our customers*”, “*We work very closely with our customers in developing solutions*”, “*We have a frank and open relationship with our clients and regular sessions are convened between ourselves and our clients*”, “*Frequent client satisfaction surveys, and good relationship management*”, “*Our approach has been very client driven – our clients first test a beta product for feedback*” and “*The 5 new systems we have put in place have been due to listening to our customers*”.

Q29. New products have a short lifespan in our industry

The majority of respondents neither agree nor disagree with this statement.

Q30. New products have a short lifespan in our industry, please explain

Several mentions were made of product lifespans becoming increasingly shorter. These included "*Innovation and new ideas are continuously representing a shorter lifespan for previous ideas*", "*Although we change products frequently, the lifespan is getting shorter*", "*The barriers of entry into our markets is not high and our competitors are quick to follow any successful new product introduction*" and "*Depends, but life-cycles tending to get shorter*".

Q31. Interaction with the external environment of my company is an important source of innovation

The majority of respondents agree with this statement.

Q32. Interaction with the external environment is an important source of innovation for my company, please explain

The respondents indicated that they interact with the external environment on various levels. These include customers, technology resource institutes, consultants, consulting services and competitors.

Q33. My company has an extensive network of external collaborators who assist us in developing new products

The majority of respondents agree with this statement.

Q34. My company has an extensive network of external collaborators who assist us in developing new products, please explain

Various respondents indicated that they outsource aspects of the new product development process in their companies. External collaborators that respondents mention include application equipment manufacturers, customers, trusted suppliers, technology resource institutes, original equipment manufacturers, consultants and industry leaders. Attending international seminars and conventions was also cited as a source of external collaboration.

Q35. My company actively seeks out new partnerships

The majority of respondents agree with this statement.

Q36. My company actively seeks out new partnerships, please explain

The acquisition of new knowledge and industry information is an important function of seeking out new partnerships. Responses include "*New knowledge partners are actively pursued*", "*We believe in skills transfer with international partners*", "*We are constantly seeking partners in our own and external industries for access to information*", "*We enter into technology partnerships with leading overseas first tier design houses*" and "*Our strategy makes provision for associations with black empowered and international enterprises looking to develop an engineering and/or a project business competence centre*".

Q37. My company is not afraid to take risks

The majority of respondents agree with this statement.

Q38. My company is not afraid to take risks, please explain

Of the responses to this question 7 indicated an aversion to risk and the remaining 26 indicated the risk taking nature of their companies. Of the latter group it is important to note that several mentions are made of measures to mitigate risk. These include "*Calculated risks*", "*Although we consider all new concepts, some are rejected on the basis of unacceptable risk*", "*We take risks but make sure we are meticulous in their execution*", "*New ventures are discussed in a collaborative manner to ensure all risks and obstacles are identified*" and "*Whereas the company is not adverse to risk taking, the directors, as the guardians of the company's assets, have a duty to ensure their proper use and protection and are required to apply risk mitigation*".

Q39. Good leadership is an important factor in stimulating innovation within my company

The majority of respondents agree with this statement.

Q40. Good leadership is an important factor in stimulating innovation within my company, please explain

Important functions of leaders who stimulate innovation are contained in these responses. They include fostering a culture of innovation, encouraging innovation, idea generation, providing frameworks, providing the right climate to allow for innovation, empowering people and unlocking creativity.

Q41. My company is effective in learning from its mistakes

The majority of respondents agree with this statement.

Q42. My company is effective in learning from its mistakes, please explain

Reactions to mistakes by their companies are outlined by several respondents and include "*When mistakes are made we try and analyze the reasons*", "…*we communicate our failure (and our successes)*", "*Solutions that are successful and failures are communicated with everyone in the organization*", "*Have frequent phase reviews and reflect on projects, actions, etc.*", "Have failure review meetings and do design and process FMEA's" and "*We are strong protagonists of the notion that mistakes are committed in pursuance of the company's objectives and that in itself provides the foundations of future decisions and strategies*".

Q43. Innovation is driven by a specific individual in my company

The majority of respondents agree with this statement.

Q44. Innovation is driven by a specific individual in my company, please explain

Various mentions were made of more than one person driving innovation and these responses include "*The 3 partners*", "*We all play a part in innovation*", "*…top management drives innovation*", "*Must be strongly supported and encouraged from the top but must be at all levels*", "*Most top management are part of the innovation process*", "*Most have a role to play*", "*Driven by a team*", "*Everyone is involved*" and "*Innovativeness is cultural not individual*".

Q45. My company is capable of effective communication externally

The majority of respondents agree with this statement.

Q46. My company is capable of effective communication externally, please explain

From these responses various forms of external communication can be identified. They include communication through partners, IT, internet, press releases, advertising, email correspondence, auto-responders, websites, e-business, publications, promotions and external communication systems.

Q47. My company employs the best people available in our industry

The majority of respondents neither agree nor disagree with this statement.

Q48. My company employs the best people available in our industry, please explain

Several mentions are made of financial constraints in employing the best people available. These include "*Insufficient resources and draw cards*", "*We employ the best people we can afford*", "*Costs are always a constraint…*", "*Cannot compete with the large company benefits and pay packages*", "*Yes, although this is difficult due to limited resources*" and "*Being small we have to, but it is difficult to compete with big company benefits*".

Q49. My company is comprised of people from diverse backgrounds

The majority of respondents agree with this statement.

Q50. My company is comprised of people from diverse backgrounds, please explain

Several responses indicated that diversity has benefits for the company. These responses include “*Diversity gives us a competitive advantage*”, “*Diversity stimulates creativity in our company*” and “*Diversity is our strength*”.

Q51. My company has a flexible organizational structure and is able to react quickly to change

The majority of respondents agree with this statement.

Q52. My company has a flexible organizational structure and is able to react quickly to change, please explain

Several respondents indicated that their organizations are able to react quickly to change through their flexible organizational structures. Comments include “*We often move people into roles that suit them best for that particular project*”, “*We can change to suit requirements*”, “*New divisions pop up to capitalize on industry growth areas*”, “*We do what is required for each project*”, “*Flexibility is key to survival*” and “*We continually adapt and or change, be it structurally or in the way we do things to best meet market requirements*”.

Q53. Experts within my company regularly hold brainstorming sessions to come up with ideas for new products

The majority of respondents agree with this statement.

Q54. Experts within my company regularly hold brainstorming sessions to come up with ideas for new products, please explain

The statements from respondents indicate that a number of companies hold regular brainstorming sessions and these are in several instances scheduled. Responses include "*This happens weekly*", "*1 or 2 times a year*", "*We hold weekly meetings*", "*We have regular product development meetings*", "…*we hold monthly technology transfer meetings with all divisions*", "*I meet with my technical team weekly*" and "*Weekly sessions are planned*".

Q55. Effective communication within my company is important in facilitating innovation

The majority of respondents agree with this statement.

Q56. Effective communication within my company is important for facilitating innovation, please explain

The respondents indicate that various methods are employed to facilitate communication within their respective companies. These include "*We have an open door policy*", "*I try to spend as much time with my staff as possible*", "*Our intranet plays an important role in this*", "*We have a flat organizational structure which encourages effective communication*", "*The channels of communication* *are always open whether upward or downward*" and "*Processing of ideas and concepts requires an effective formal and informal communication network*".

Q57. My company is continuously launching new products

The majority of respondents agree with this statement.

Q58. My company is continuously launching new products, please explain

Respondents give an indication of the frequency of new product launches by their companies. The frequencies included "*Several new products are launched every month*", "*One per week*", "*Every 6 months or so*" and "*Almost quarterly*".

Q59. New products form an important part of the income of my company

The majority of respondents agree with this statement.

Q60. New products form an important part of the income of my company, please explain

Several respondents give an indication of the impact of new products on the income of their companies. Responses include "*New products have higher profit margins*", "*New products always have a significant impact on our bottom line*", "*New products equals higher turnover*", "*It forms the bulk of our income*" and "75%".

Q61. My company has a state of the art research and development department

The majority of respondents disagree with this statement.

Q62. My company has a state of the art research and development department, please explain

Although several respondents indicate that they do not have a research and development department, for a number of respondents research and development is an important function within their companies. Responses include "*We have large and modern R&D facilities in the USA and Germany …*", "*Major R&D centre in the UK*", "…*R&D is thus a critical success factor to our company*", "*This is where most of our turnover is spent – developer salaries*" and "*We have persons throughout the company who do R&D as all staff are encouraged to do so*" and "*Good staff, adequate resources – basically good enough but not over the top*".

Q63. My company is passionate about innovation

The majority of respondents agree strongly with this statement.

Q64. My company is passionate about innovation, please explain

Several different indications are given by respondents of the extent of their companies passion for innovation. Responses include "*100% of revenues come from products that are less than 5 years old*", "*Byline: traditional values, innovative ideas*", "…*To be part of the game we need to stay abreast and keep* *focus on innovation*", "*When dealing in the IT industry you are always forced to focus on innovation*", "*We love what we do and the products we develop…*", "*Innovation knows no boundaries in my company*", "*Incentives are given to innovators. Complacency is not tolerated…*" and "*All staff are able to log ideas and opportunities for innovation*".

5.3 Factor Analysis

The quantitative data after factor analysis resulted in 6 factors being retained. It should however be noted that the 6 factors do not constitute a perfect fit, but rather a general match with certain of the propositions which were posited prior to the distribution of the questionnaires. Note that question 35 was included in factor 3 and factor 6 of the solution. It was decided to retain question 35 in factor 3 as it had a higher percentage of communality with this factor than with factor 6. Furthermore question 39 was included in factor 1 and factor 3 of the solution. It was decided to retain question 39 in factor 1 as it had a higher percentage of communality with this factor than with factor 3. Question 15 was also included in factor 2 as well as factor 6 of the solution. It was decided to retain question 15 in factor 6 as it had a higher percentage of communality with this factor than with factor 2.

5.3.1 The factors

FACTOR 1

Q49 – My company is comprised of people from diverse backgrounds

Q29 – New products have a short lifespan in our industry

Q39 – Good leadership is an important factor in stimulating innovation within my company

Q51 – My company has a flexible organizational structure and is able to react quickly to change

Q37 – My company is not afraid to take risks

Q41 - My company is effective in learning from its mistakes

Q27 – My company know exactly what its customers want and need

All of the retained questions under this factor with the exception of Q29 and Q27 support **PROPOSITION 5**:

INNOVATIVE FIRMS ARE CHARACTERIZED BY A SPECIFIC KIND OF CULTURE WHICH FOSTERS INNOVATION

Q27 and Q29 support **PROPOSITION 6**:

INNOVATION IS STIMULATED BY THE PRESENCE OF SPECIFIC EXTERNAL FACTORS

FACTOR 2

Q63 – My company is passionate about innovation

Q21 – My company uses state of the art information technology systems to develop new products

Q7 – My company has a set procedure for managing innovation

Q9 – My company has the ability to quickly design, develop and launch new products

Q43 – Innovation is driven by a specific individual in my company

Q63 and Q43 support **PROPOSITION 5:**

INNOVATIVE FIRMS ARE CHARACTERIZED BY A SPECIFIC KIND OF CULTURE WHICH FOSTERS INNOVATION

Q7 and Q9 support **PROPOSITION 1:**

A SET PROCEDURE IS REQUIRED WITHIN A FIRM IN ORDER TO EFFECTIVELY HARNESS INNOVATION

Q21 supports **PROPOSITION 4:**

INFORMATION TECHNOLOGY AND THE RAPID DISSEMINATION OF INFORMATION PLAYS A KEY ROLE IN INNOVATION WITHIN FIRM

FACTOR 3

Q33 – My company has an extensive network of external collaborators who assist us in developing new products

Q31 – Interaction with the external environment of my company is an important source of innovation

Q25 – Demographics influence my company's decisions to develop new product

Q35 – My company actively seeks out new partnerships

Q61 – My company has a state of the art research and development department

Q47 – My company employs the best people available in our industry

Q31, Q25 and Q35 support **PROPOSITION 6:**

INNOVATION IS STIMULATED BY THE PRESENCE OF SPECIFIC EXTERNAL FACTORS

Q33, Q61 and Q47 support **PROPOSITION 5:**

INNOVATIVE FIRMS ARE CHARACTERIZED BY A SPECIFIC KIND OF CULTURE WHICH FOSTERS INNOVATION

FACTOR 4

Q57 – My company is continuously launching new products

Q45 – My company is capable of effective communication externally

Q37 – My company is not afraid to take risks

Q59 – New products form an important part of the income of my company

Q53 – Experts within my company regularly hold brainstorming sessions to come up with ideas for new products

Q57, Q45, Q37, Q59 and Q53 all support **PROPOSITION 5:**

INNOVATIVE FIRMS ARE CHARACTERIZED BY A SPECIFIC KIND OF CULTURE WHICH FOSTERS INNOVATION)

FACTOR 5

Q11– Government supports innovation within companies in South Africa

Q13 – My company has approached a government department for assistance with innovation

Q11 and Q13 support **PROPOSITION 3:**

THE ENVIRONMENT ON BOTH A NATIONAL AND REGIONAL LEVEL WITHIN WHICH INNOVATION TAKES PLACE IS IMPORTANT TO THE CREATION AND IMPLEMENTATION OF INNOVATIONS WITHIN FIRMS

FACTOR 6

Q23 – The industry within which my company competes is highly competitive

Q15 – Innovation is a key strategic issue within my company

Q17 - Sustainable competitive advantage is based on the continuous ability of my company to innovate

Q23 supports **PROPOSITION 6:**

INNOVATION IS STIMULATED BY THE PRESENCE OF SPECIFIC EXTERNAL FACTORS

Q15 and Q17 support **PROPOSITION 2:**

INNOVATIVE FIRMS HAVE DEVELOPED STRATEGIES WHICH FOCUS ON INNOVATION

6. Conclusion

6.1 Importance of the Study

The study may be of use to firms which are struggling with the concept of innovation within their own organizations. Through the analysis of the factors identified in this study and assessing the current application of these in an individual firm, harnessing the innovation capability of the organization could possibly be enhanced.

6.2 The main Findings of the Study

Although the factor analysis which was conducted did not clearly point to 6 separate factors *per se*, but rather generalized groupings of questions pertaining to specific propositions under each factor, the study does serve to confirm the existence of each of the propositions as drivers of innovation in South African firms.

6.3 Suggestions for Further Research

A possible area for further research could be took take an in depth look at one or more of the propositions posited in this study.

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ANNEXURE A

Research Problem	Proposition number	Proposition	Source of proposition	Source of data	Analysis	Question Numbers
The purpose of this research is to determine what the key drivers of product innovation are in South African firms.	**1**	A set procedure is required within a firm in order to effectively harness innovation	(Corti & Lo Storto, 2000, Buggie,2001, Dooley & O'Sullivan, 2001, Lawson & Samson, 2001, Drucker, 2002, Hickman & Raia,2002, Oglibina *et al.* 2002, Radnor & Noke, 2002, Wolpert, 2002, Goldenberg *et al.* 2003, Jagersma, 2003)	Quantitative survey instrument	Factor Analysis	Q7-Q10

Research Problem	**Proposition number**	**Proposition**	**Source of proposition**	**Source of data**	**Analysis**	**Question Numbers**
	2	Innovative firms have developed strategies which focus on innovation	(Prahalad & Hamel, 1990, Ozsomer *et al.* 1997, Lawson & Samson, 2001, Buggie, 2001, Christiansen & Christer, 2002, Hickman & Raia, 2002, Oglobina *et al.* 2002, Rigby & Zook, 2002, Jagersma, 2003, Madden *et al.* 2003, Nohria *et al.* 2003, Slywotsky & Wise, 2003, Walker & Lewis, 2003	Quantitative survey instrument	Factor Analysis	Q15-18
	3	The environment on both a national and regional level within which innovation takes place is important to the creation and implementation of innovations within firms	(Hinloopen, 2001, Christiansen & Christer, 2002, Khan,2002, Oglibina *et al.* 2002)	Quantitative survey instrument	Factor Analysis	Q11-Q14

Research Problem	Proposition number	Proposition	Source of proposition	Source of data	Analysis	Question Numbers
	4	Information technology and the rapid dissemination of information plays a key role in innovation within firms	(Ozsomer *et al.* 1997, Mytelka, 2000, The Economist, 2001, Dodgson *et al.* 2002, Drucker, 2002, Chandy *et al.* 2003, Farrell, 2003)	Quantitative survey instrument	Factor Analysis	Q19-22
	5	Innovative firms are characterized by a specific kind of culture which fosters innovation. The culture of an innovative firm may include the presence of factors such as : effective leadership, effective communication, commercialisation skills, a customer orientation, effective management of diversity, a culture of risk taking, passion, flexibility and an organizational learning ability	(Schumpeter, 1939, Rothwell, 1992, Buggie, 2001, Lawson & Samson, 2001, Akrich, Callon, Latour & Monaghan, 2002, Christiansen & Christer, 2002, Oglibina *et al.* 2002, Harvard Business Review, 2002, Hickman & Raia, 2002, Rigby & Zook, 2002, Teresko, 2002, Chandy *et al.* 2003, Davenport *et al.* 2003, Goldenberg *et al.* 2003, Harvard Business Review, 2003, Jagersma, 2003, Nohria *et al.* 2003, Walker & Lewis, 2003)	Quantitative survey instrument	Factor Analysis	Q33-64

Research Problem	**Proposition number**	**Proposition**	**Source of proposition**	**Source of data**	**Analysis**	**Question Numbers**
	6	Innovation is stimulated by the presence of specific external factors. These factors may include: competition, the needs and wants of consumers, market reactions, demographic changes, strategic alliances, outside experts and networks	(Mytelka, 2000, Akrich *et al.* 2002, Buggie, 2001, Drucker, 2002, Hickman & Raia, 2002, Oglibina *et al.* 2002, Teresko, 2002, Farrell, 2003, Goldenberg *et al.* 2003, Jagersma, 2003)	Quantitative survey instrument	Factor Analysis	Q23-Q34

ANNEXURE B

Dear Sir,

I am conducting a survey as part of my mba research report. It would be much appreciated if you would take part, and complete the questionnaire as detailed below as soon as possible. The title of my research report is "The Key Drivers of Innovation in South African Firms".

The survey is conducted anonymously thus protecting your personal privacy as well as that of your company.

Simply click on the following link and you will be taken straight to the survey:
http://www.surveymonkey.com/s.asp?A=98629678E22474

Click on the submit button at the end of the survey when you are done.

Thanks for your participation,

Charl Coetzee

ANNEXURE C

innovation research Exit this survey >>

1. Company

Your assistance in answering the following questions is much appreciated. Please be assured that your personal details and company information are strictly confidential and will not be disclosed.

*** 1. Number of employees**

1-10 10-50 50-100 100+

*** 2. Turnover**

- R0-R5 000 000pa
- R5 000 000pa-R10 000 000pa
- R10 000 000pa+

*** 3. Industry type**

*** 4. Position held**

*** 5. Number of years in existence**

* 6. City/Town

Next >>

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innovation research Exit this survey >>

2. Innovation procedure

* 7. My company has a set procedure for managing innovation

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
○	○	○	○	○

8. Please explain...

* 9. My company has the ability to quickly design,develop and launch new products

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

10. Please explain...

<< Prev **Next >>**

---

innovation research Exit this survey >>

3. Public innovation infrastructure

*** 11. Government supports innovation within companies in South Africa**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

12. Please explain...

*** 13. My company has approached a government department for assistance with innovation**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

14. Please explain...

<< Prev **Next >>**

innovation research Exit this survey >>

4. Strategic relevance

*** 15. Innovation is a key strategic issue in my company**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

16. Please explain...

*** 17. Sustainable competitive advantage is based on the continuous ability of my company to innovate**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

18. Please explain...

<< Prev **Next >>**

innovation research | Exit this survey >>

5. Role of information

*** 19. My company has access to the latest information relevant to our business**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

20. Please explain...

*** 21. My company uses state of the art information technology systems to develop new products**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

22. Please explain...

[<< Prev](#) [Next >>](#)

innovation research Exit this survey >>

6. External environment

*** 23. The industry within which my company competes is highly competitive**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
○	○	○	○	○

24. Please explain...

*** 25. Demographics influence my company's decisions to develop new products**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
○	○	○	○	○

26. Please explain...

*** 27. My company knows exactly what its customers want and need**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

28. Please explain...

*** 29. New products have a short lifespan in our industry**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

30. Please explain...

*** 31. Interaction with the external environment of my company is an important source of innovation**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

32. Please explain...

<< Prev **Next >>**

---

innovation research Exit this survey >>

7. External networks

*** 33. My company has an extensive network of external collaborators who assist us in developing new products**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

34. Please explain...

*** 35. My company actively seeks out new partnerships**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

36. Please explain...

<< Prev **Next >>**

innovation research Exit this survey >>

8. Organizational culture

*** 37. My company is not afraid to take risks**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

38. Please explain...

*** 39. Good leadership is an important factor in stimulating innovation within my company**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

40. Please explain...

*** 41. My company is effective in learning from its mistakes**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

42. Please explain...

<< Prev **Next >>**

innovation research **Exit this survey >>**

9. Organizational structure

*** 43. Innovation is driven by a specific individual in my company**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

44. Please explain...

*** 45. My company is capable of effective communication externally**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
○	○	○	○	○

46. Please explain...

*** 47. My company employs the best people available in our industry**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
○	○	○	○	○

48. Please explain...

*** 49. My company is comprised of people from diverse backgrounds**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

50. Please explain...

*** 51. My company has a flexible organizational structure and is able to react quickly to change**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

52. Please explain...

*** 53. Experts within my company regularly hold brainstorming sessions to come up with ideas for new products**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
○	○	○	○	○

54. Please explain...

*** 55. Effective communication within my company is important in facilitating innovation**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
○	○	○	○	○

56. Please explain...

<< Prev **Next >>**

innovation research Exit this survey >>

10. Innovation focus

*** 57. My company is continuously launching new products**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

58. Please explain...

*** 59. New products form an important part of the income of my company**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

60. Please explain...

*** 61. My company has a state of the art research and development department**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

62. Please explain...

*** 63. My company is passionate about innovation**

strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

64. Please explain...

<< Prev **Next >>**

---

innovation research **Exit this survey >>**

Thank you for your kind assistance in completing this survey.

<< Prev **Done >>**

ANNEXURE D: RESULTS BEFORE RESCALING

Number of employees	Turnover	Industry type	position held	Number of years in existence	My company has a set procedure for managing innovation	My company has the ability to quickly design,develop and launch new products	Government supports innovation within companies in South Africa	My company has approached a government department for assistance with innovation	Innovation is a key strategic issue in my company	Sustainable competitive advantage is based on the continuous ability of my company to innovate	My company has access to the latest information relevant to our business	My company uses state of the art information technology systems to develop new products	The industry within which my company competes is highly competitive	Demographics influence my company's decisions to develop new products	My company knows exactly what its customers want and need	New products have a short lifespan in our industry	Interaction with the external environment of my company is an important source of innovation	My company has an extensive network of external collaborators who assist us in developing new products	My company actively seeks out new partnerships	My company is not afraid to take risks	Good leadership is an important factor in stimulating innovation within my company	My company is effective in learning from its mistakes	Innovation is driven by a specific individual in my company	My company is capable of effective communication externally	My company employs the best people available in our industry	My company is comprised of people from diverse backgrounds	My company has a flexible organizational structure and is able to react quickly to change	Experts within my company regularly hold brainstorming sessions to come up with ideas for new products	Effective communication within my company is important in facilitating innovation	My company is continuously launching new products	New products form an important part of the income of my company	My company has a state of the art research and development department	My company is passionate about innovation
4	3	Auctions and Valuations	Group Director	9	4	1	5	5	1	1	4	3	1	1	1	3	1	1	1	1	1	1	3	1	4	1	1	1	1	2	1	4	1
1	1	Photography	Owner	5	4	3	4	4	2	2	2	3	1	3	2	2	2	2	1	2	2	1	1	1	1	3	1	3	3	4	3	2	1
1	1	Advertising	Director	2	3	3	2	3	1	1	1	3	2	2	2	4	1	1	1	1	1	2	2	2	1	2	1	2	2	2	2	2	1
2	1	Construction	Managing Director	7	4	3	3	3	2	2	3	4	1	4	1	2	3	2	1	2	3	3	3	1	2	2	2	2	2	1	3	3	2
1	1	Communications	Director	6	3	4	3	4	3	3	2	2	3	5	2	3	2	2	2	2	2	2	4	2	3	1	2	1	3	1	2	3	3
1	1	Hospitality	General Manager	4	3	3	4	4	2	2	1	1	1	3	3	3	3	2	2	4	2	3	4	3	4	2	1	2	2	3	2	4	1
3	3	IT	Managing Director	15	2	2	2	3	1	1	3	2	2	3	1	2	2	2	2	3	3	2	3	3	2	3	4	2	3	2	1	3	2
4	3	Telecommunications	Marketing Director	8	4	4	3	4	2	2	2	3	1	2	2	3	3	2	1	2	2	2	2	3	3	2	2	1	1	2	3	2	2
2	2	Aquaculture	Managing Director	6	3	4	3	4	2	1	3	3	2	2	2	1	2	1	1	4	2	1	3	2	3	3	5	3	1	1	3	5	3
2	3	IT	CEO	5	3	2	4	5	3	3	3	2	3	3	2	3	1	2	2	5	1	2	3	4	3	2	2	3	2	3	4	2	2
3	3	Labour	Director	11	2	3	3	3	3	2	1	2	3	4	3	3	2	2	3	2	2	2	4	4	2	2	2	5	2	2	3	3	1
1	1	Security	Director	3	4	4	5	5	1	2	2	3	2	5	1	1	2	4	2	3	2	3	2	3	1	1	1	2	3	2	3	4	1
3	3	Insurance	Director	17	1	1	4	4	2	1	4	3	3	1	3	3	2	3	2	4	3	2	1	1	2	3	2	3	3	3	3	3	2
4	3	Timber	Owner	25	3	3	2	3	3	2	2	3	2	2	4	4	3	3	3	2	2	3	5	3	2	2	3	2	2	4	2	4	3
1	2	Electronics	Director	5	2	2	3	2	2	2	2	1	1	3	2	2	3	2	2	1	1	2	3	4	3	2	3	4	3	2	4	2	2
2	3	Vehicle Tracking	Director	12	3	3	4	5	1	2	3	2	1	3	3	3	2	2	1	2	3	1	2	2	2	2	1	2	1	1	5	3	3
2	2	IT	Managing Director	8	1	2	5	3	3	3	3	2	3	2	3	2	1	2	2	3	1	1	1	1	2	3	2	2	2	2	2	5	2
2	2	IT	CEO	22	3	3	3	2	1	1	1	1	2	4	2	3	3	3	2	2	2	4	3	2	3	2	3	5	3	4	1	3	2
1	2	Property	Owner	9	3	3	4	5	1	2	1	3	2	3	1	4	3	3	3	1	1	2	2	1	3	1	1	2	2	2	1	4	3
4	3	Engineering	Director	30	2	3	1	3	2	3	2	4	1	2	3	2	2	2	2	3	3	3	4	2	2	3	5	3	2	1	2	4	3
1	1	Textiles	General Manager	6	5	4	3	4	3	3	3	2	2	1	3	3	3	4	2	2	2	2	2	3	2	3	2	3	3	2	3	5	4
3	3	Logistics	Director	19	2	1	3	3	2	4	3	4	3	3	2	3	4	3	3	3	3	2	4	3	3	2	3	3	2	3	4	3	1
2	2	ufacturing cleaning products	Director	6	1	3	5	3	2	3	1	1	1	4	3	2	1	3	1	5	3	3	3	4	3	3	4	2	3	3	3	4	1
1	1	Aviation	Managing Director	4	4	4	3	5	2	1	2	3	1	2	2	4	4	2	2	4	2	2	2	4	3	2	2	2	2	4	2	5	2
1	1	Industrial Property	Director	14	4	3	4	3	4	3	1	3	2	3	2	3	3	3	2	3	2	2	2	3	4	2	2	3	2	3	3	5	3
2	2	Law	Attorney	75	4	5	2	2	2	1	1	4	1	5	1	5	2	3	1	5	1	2	2	4	2	1	4	5	1	5	5	3	4
1	1	IT	Director	5	1	1	2	2	2	1	1	1	2	4	2	4	5	4	1	1	2	2	4	3	3	2	1	1	1	2	2	3	1
3	3	Manufacturing	Director	36	4	4	3	4	3	3	2	4	2	4	2	4	2	4	2	4	3	2	2	2	2	3	2	4	2	4	4	4	3
1	1	Back-office services	Director	1	2	1	3	4	1	2	2	1	3	4	3	3	1	3	2	2	3	2	4	2	3	2	1	2	2	1	2	4	1
4	3	Travel & Tourism	Managing Director	10	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	2	3	2	2	3	2	2	2	2	2	1	2
1	3	Industrial Deterrents	Director	15	3	1	3	3	4	2	2	4	2	4	2	2	3	4	4	2	2	2	2	2	3	2	2	3	2	4	2	4	4
2	3	Administration	Branch Manager	8	3	1	3	5	2	4	3	3	1	3	2	3	1	3	4	3	2	2	4	2	3	2	2	3	2	3	3	3	3
2	1	Clothing	Managing Director	4.5	2	3	3	4	4	4	2	3	2	3	1	5	1	1	4	1	1	1	3	2	3	2	1	2	2	2	2	4	4
4	3	Real Estate	Managing Director	50	2	2	2	4	2	1	1	1	1	1	1	3	2	2	2	3	2	2	3	2	1	1	1	1	1	1	1	1	1
4	3	Medical Pharmaceutical	Director	30	1	1	3	3	1	1	2	3	2	2	3	3	2	2	2	4	2	2	4	3	2	2	2	2	2	2	3	3	1
2	2	Merchant Banking	Director	13	2	3	4	2	1	1	3	3	1	3	2	4	2	3	2	1	2	1	2	2	1	2	3	2	3	2	2	2	1
4	3	Mechanical Engineering	Medical Liason	50	4	1	4	3	1	1	2	3	1	4	4	3	4	3	3	4	1	2	1	1	4	1	4	2	1	1	4	4	4
4	3	Clothing Manufacturing	Financial analyst	3	3	1	3	5	1	1	1	1	1	3	2	3	3	4	2	3	1	2	3	2	2	1	1	1	1	3	4	4	2
1	1	Exhibitions	Co-owner	0.08	3	1	3	5	1	3	1	5	1	1	2	3	1	1	1	2	1	1	2	2	2	1	1	2	1	2	2	3	1
2	3	IT and Research	Marketing Manager	13	4	3	2	4	1	1	1	3	2	2	1	4	1	1	1	1	1	1	2	2	1	1	2	2	1	2	2	1	1
1	1	Telecoms	General Manager	4	2	4	3	5	2	2	2	4	2	4	2	4	2	2	1	3	2	2	2	3	3	2	2	4	2	4	4	4	2
2	3	Food and Beverage	Financial Manager	5	4	2	2	1	3	2	2	3	3	4	3	2	4	5	2	2	2	3	3	2	3	2	2	3	3	2	2	3	2
2	3	Mining	CEO	3.5	2	1	5	4	1	1	2	2	3	4	2	3	2	4	3	1	1	2	4	2	3	2	2	2	2	3	3	4	1
1	1	Media	Owner/manager	15.5	3	1	2	3	1	1	2	4	1	4	2	5	2	2	2	1	1	1	2	2	5	2	1	2	2	3	2	5	1
3	3	Spatial Information Solutions	Head: HR, Policy & Strategy	8	3	2	2	2	2	2	2	2	2	3	2	4	2	2	3	2	2	2	2	2	3	2	2	2	2	2	3	4	2
2	2	ICT	Director	15	3	1	1	1	1	1	2	1	1	5	2	2	2	5	4	1	2	3	1	4	4	2	2	1	1	1	1	2	1
2	2	Information Technology	Director	5	3	1	5	3	2	2	4	1	2	4	1	3	3	4	3	2	2	2	4	2	1	2	1	4	1	3	2	4	1
2	3	usiness Consulting Services	CEO	8	4	1	3	5	1	1	1	2	1	5	2	4	1	4	3	2	2	1	5	2	1	2	2	1	1	3	3	5	1
3	3	Manufacturing	Managing Director	21	2	1	2	2	3	2	2	4	3	3	2	4	3	4	2	2	2	2	3	2	2	2	2	2	2	2	2	4	2
4	3	utomotive Electrical Systems	ead of Quality and Products	35	2	4	3	3	2	1	2	2	2	3	2	3	4	2	2	2	2	2	3	2	3	2	1	3	1	1	2	3	2
1	1	ICT - New media	General Manager	3	2	2	5	1	1	1	2	1	1	3	2	2	2	2	2	2	2	2	4	2	2	2	2	1	1	1	1	3	1
4	3	cturing ,Services (Electrical)	Managing Director	17	1	5	1	1	1	1	1	2	1	1	2	4	1	2	1	2	1	2	5	2	3	1	2	2	1	4	3	4	2
17	16				6	17	3	4	20	22	15	11	22	6	10	2	12	6	14	11	16	11	5	7	8	11	16	9	17	11	7	3	21
17	10				15	9	11	7	20	18	24	13	20	10	29	12	21	22	25	21	27	32	17	27	17	31	25	24	24	20	20	7	17
7	26				17	15	22	17	9	9	10	18	10	17	11	22	13	12	9	10	9	8	15	11	21	10	5	12	11	12	16	16	9
11					13	9	9	13	3	3	3	9	0	14	2	13	5	10	4	7	0	1	12	7	5	0	4	4	0	8	7	19	5
					1	2	7	11	0	0	0	1	0	5	0	3	1	2	0	3	0	0	3	0	1	0	2	3	0	1	2	7	0

ANNEXURE E: RESULTS AFTER RESCALING

Number of employees	Turnover	Industry type	position held	Number of years in existence	My company has a set procedure for managing innovation	My company has the ability to quickly design,develop and launch new products	Government supports innovation within companies in South Africa	My company has approached a government department for assistance with innovation	Innovation is a key strategic issue in my company	Sustainable competitive advantage is based on the continuous ability of my company to innovate	My company has access to the latest information relevant to our business	My company uses state of the art information technology systems to develop new products	The industry within which my company competes is highly competitive	Demographics influence my company's decisions to develop new products	My company knows exactly what its customers want and need	New products have a short lifespan in our industry	Interaction with the external environment of my company is an important source of innovation	My company has an extensive network of external collaborators who assist us in developing new products	My company actively seeks out new partnerships	My company is not afraid to take risks	Good leadership is an important factor in stimulating innovation within my company	My company is effective in learning from its mistakes	Innovation is driven by a specific individual in my company	My company is capable of effective communication externally	My company employs the best people available in our industry	My company is comprised of people from diverse backgrounds	My company has a flexible organizational structure and is able to react quickly to change	Experts within my company regularly hold brainstorming sessions to come up with ideas for new products	Effective communication within my company is important in facilitating innovation	My company is continuously launching new products	New products form an important part of the income of my company	My company has a state of the art research and development department	My company is passionate about innovation
4	3	Auctions and Valuations	Group Director	9	3.993	1	5	5	1	1	3.993	3.146	1	1	1	3.146	1	1	1	1	1	1	3.146	1	3.993	1	1	1	1	2.019	1	3.993	1
1	1	Photography	Owner	5	3.993	3.146	3.993	3.993	2.019	2.019	2.019	3.146	1	3.146	2.019	2.019	2.019	2.019	1	2.019	2.019	1	1	1	1	3.146	1	3.146	3.146	3.993	3.146	2.019	1
1	1	Advertising	Director	2	3.146	3.146	2.019	3.146	1	1	1	3.146	2.019	2.019	2.019	3.993	1	1	1	1	1	2.019	2.019	2.019	1	2.019	1	2.019	2.019	2.019	2.019	2.019	1
2	1	Construction	Managing Director	7	3.993	3.146	3.146	3.146	2.019	2.019	3.146	3.993	1	3.993	1	2.019	3.146	2.019	1	2.019	3.146	3.146	3.146	1	2.019	2.019	2.019	2.019	2.019	1	3.146	3.146	2.019
1	1	Communications	Director	6	3.146	3.993	3.146	3.993	3.146	3.146	2.019	2.019	3.146	5	2.019	3.146	2.019	2.019	2.019	2.019	2.019	2.019	3.993	2.019	3.146	1	2.019	1	3.146	1	2.019	3.146	3.146
1	1	Hospitality	General Manager	4	3.146	3.146	3.993	3.993	2.019	2.019	1	1	1	3.146	3.146	3.146	3.146	2.019	2.019	3.993	2.019	3.146	3.993	3.146	3.993	2.019	1	2.019	2.019	3.146	2.019	3.993	1
3	3	IT	Managing Director	15	2.019	2.019	2.019	3.146	1	1	3.146	2.019	2.019	3.146	1	2.019	2.019	2.019	2.019	3.146	3.146	2.019	3.146	3.146	2.019	3.146	3.993	2.019	3.146	2.019	1	3.146	2.019
4	3	Telecommunications	Marketing Director	8	3.993	3.993	3.146	3.993	2.019	2.019	2.019	3.146	1	2.019	2.019	3.146	3.146	2.019	1	2.019	2.019	2.019	2.019	3.146	3.146	2.019	2.019	1	1	2.019	3.146	2.019	2.019
2	2	Aquaculture	Managing Director	6	3.146	3.993	3.146	3.993	2.019	1	3.146	3.146	2.019	2.019	2.019	1	2.019	1	1	3.993	2.019	1	3.146	2.019	3.146	3.146	5	3.146	1	1	3.146	5	3.146
2	3	IT	CEO	5	3.146	2.019	3.993	5	3.146	3.146	3.146	2.019	3.146	3.146	2.019	3.146	1	2.019	2.019	5	1	2.019	3.146	3.993	3.146	2.019	2.019	3.146	2.019	3.146	3.993	2.019	2.019
3	3	Labour	Director	11	2.019	3.146	3.146	3.146	3.146	2.019	1	2.019	3.146	3.993	3.146	3.146	2.019	2.019	3.146	2.019	2.019	2.019	3.993	3.993	2.019	2.019	2.019	5	2.019	2.019	3.146	3.146	1
1	1	Security	Director	3	3.993	3.993	5	5	1	2.019	2.019	3.146	2.019	5	1	1	2.019	3.993	2.019	3.146	2.019	3.146	2.019	3.146	1	1	1	2.019	3.146	2.019	3.146	3.993	1
3	3	Insurance	Director	17	1	1	3.993	3.993	2.019	1	3.993	3.146	3.146	1	3.146	3.146	2.019	3.146	2.019	3.993	3.146	2.019	1	1	2.019	3.146	2.019	3.146	3.146	3.146	3.146	3.146	2.019
4	3	Timber	Owner	25	3.146	3.146	2.019	3.146	3.146	2.019	2.019	3.146	2.019	2.019	3.993	3.993	3.146	3.146	3.146	2.019	2.019	3.146	5	3.146	2.019	2.019	3.146	2.019	2.019	3.993	2.019	3.993	3.146
1	2	Electronics	Director	5	2.019	2.019	3.146	2.019	2.019	2.019	2.019	1	1	3.146	2.019	2.019	3.146	2.019	2.019	1	1	2.019	3.146	3.993	3.146	2.019	3.146	3.993	3.146	2.019	3.993	2.019	2.019
2	3	Vehicle Tracking	Director	12	3.146	3.146	3.993	5	1	2.019	3.146	2.019	1	3.146	3.146	3.146	2.019	2.019	1	2.019	3.146	1	2.019	2.019	2.019	2.019	1	2.019	1	1	5	3.146	3.146
2	2	IT	Managing Director	8	1	2.019	5	3.146	3.146	3.146	3.146	2.019	3.146	2.019	3.146	2.019	1	2.019	2.019	3.146	1	1	1	1	2.019	3.146	2.019	2.019	2.019	2.019	2.019	5	2.019
2	2	IT	CEO	22	3.146	3.146	3.146	2.019	1	1	1	1	2.019	3.993	2.019	3.146	3.146	3.146	2.019	2.019	2.019	3.993	3.146	2.019	3.146	2.019	3.146	5	3.146	3.993	1	3.146	2.019
1	2	Mining	Owner	9	3.146	3.146	3.993	5	1	2.019	1	3.146	2.019	3.146	1	3.993	3.146	3.146	3.146	1	1	2.019	2.019	1	3.146	1	1	2.019	2.019	2.019	1	3.993	3.146
4	3	Engineering	Director	30	2.019	3.146	1	3.146	2.019	3.146	2.019	3.993	1	2.019	3.146	2.019	2.019	2.019	2.019	3.146	3.146	3.146	3.993	2.019	2.019	3.146	5	3.146	2.019	1	2.019	3.993	3.146
1	1	Textiles	General Manager	6	5	3.993	3.146	3.993	3.146	3.146	3.146	2.019	2.019	1	3.146	3.146	3.146	3.993	2.019	2.019	2.019	2.019	2.019	3.146	2.019	3.146	2.019	3.146	3.146	2.019	3.146	5	3.993
3	3	Logistics	Director	19	2.019	1	3.146	3.146	2.019	3.993	3.146	3.993	3.146	3.146	2.019	3.146	3.993	3.146	3.146	3.146	3.146	2.019	3.993	3.146	3.146	2.019	3.146	3.146	2.019	3.146	3.993	3.146	1
2	2	ufacturing cleaning products	Director	6	1	3.146	5	3.146	2.019	3.146	1	1	1	3.993	3.146	2.019	1	3.146	1	5	3.146	3.146	3.146	3.993	3.146	3.146	3.993	2.019	3.146	3.146	3.146	3.993	1
1	1	Aviation	Managing Director	4	3.993	3.993	3.146	5	2.019	1	2.019	3.146	1	2.019	2.019	3.993	3.993	2.019	2.019	3.993	2.019	2.019	2.019	3.993	3.146	2.019	2.019	2.019	2.019	3.993	2.019	5	2.019
1	1	Industrial Property	Director	14	3.993	3.146	3.993	3.146	3.993	3.146	1	3.146	2.019	3.146	2.019	3.146	3.146	3.146	2.019	3.146	2.019	2.019	2.019	3.146	3.993	2.019	2.019	3.146	2.019	3.146	3.146	5	3.146
2	2	Law	Attorney	75	3.993	5	2.019	2.019	2.019	1	1	3.993	1	5	1	5	2.019	3.146	1	5	1	2.019	2.019	3.993	2.019	1	3.993	5	1	5	5	3.146	3.993
1	1	IT	Director	5	1	1	2.019	2.019	2.019	1	1	1	2.019	3.993	2.019	3.993	5	3.993	1	1	2.019	2.019	3.993	3.146	3.146	2.019	1	1	1	2.019	2.019	3.146	1
3	3	Manufacturing	Director	36	3.993	3.993	3.146	3.993	3.146	3.146	2.019	3.993	2.019	3.993	2.019	3.993	2.019	3.993	2.019	3.993	3.146	2.019	2.019	2.019	2.019	3.146	2.019	3.993	2.019	3.993	3.993	3.993	3.146
1	1	Back-office services	Director	1	2.019	1	3.146	3.993	1	2.019	2.019	1	3.146	3.993	3.146	3.146	1	3.146	2.019	2.019	3.146	2.019	3.993	2.019	3.146	2.019	1	2.019	2.019	1	2.019	3.993	1
4	3	Travel & Tourism	Managing Director	10	2.019	2.019	3.146	3.146	2.019	2.019	2.019	2.019	2.019	2.019	2.019	2.019	2.019	2.019	2.019	2.019	1	2.019	3.146	2.019	2.019	3.146	2.019	2.019	2.019	2.019	2.019	1	2.019
1	3	Industrial Deterrents	Director	15	3.146	1	3.146	3.146	3.993	2.019	2.019	3.993	2.019	3.993	2.019	2.019	3.146	3.993	3.993	2.019	2.019	2.019	2.019	2.019	3.146	2.019	2.019	3.146	2.019	3.993	2.019	3.993	3.993
2	3	Administration	Branch Manager	8	3.146	1	3.146	5	2.019	3.993	3.146	3.146	1	3.146	2.019	3.146	1	3.146	3.993	3.146	2.019	2.019	3.993	2.019	3.146	2.019	2.019	3.146	2.019	3.146	3.146	3.146	3.146
2	1	Clothing	Managing Director	4.5	2.019	3.146	3.146	3.993	3.993	3.993	2.019	3.146	2.019	3.146	1	5	1	1	3.993	1	1	1	3.146	2.019	3.146	2.019	1	2.019	2.019	2.019	2.019	3.993	3.993
4	3	Real Estate	Managing Director	50	2.019	2.019	2.019	3.993	2.019	1	1	1	1	1	1	3.146	2.019	2.019	2.019	3.146	2.019	2.019	3.146	2.019	1	1	1	1	1	1	1	1	1
4	3	Medical Pharmaceutical	Director	30	1	1	3.146	3.146	1	1	2.019	3.146	2.019	2.019	3.146	3.146	2.019	2.019	2.019	3.993	2.019	2.019	3.993	3.146	2.019	2.019	2.019	2.019	2.019	2.019	3.146	3.146	1
2	2	Merchant Banking	Director	13	2.019	3.146	3.993	2.019	1	1	3.146	3.146	1	3.146	2.019	3.993	2.019	3.146	2.019	1	2.019	1	2.019	2.019	1	2.019	3.146	2.019	3.146	2.019	2.019	2.019	1
4	3	Mechanical Engineering	Medical Liason	50	3.993	1	3.993	3.146	1	1	2.019	3.146	1	3.993	3.993	3.146	3.993	3.146	3.146	3.993	1	2.019	1	1	3.993	1	3.993	2.019	1	1	3.993	3.993	3.993
4	3	Clothing Manufacturing	Financial analyst	3	3.146	1	3.146	5	1	1	1	1	1	3.146	2.019	3.146	3.146	3.993	2.019	3.146	1	2.019	3.146	2.019	2.019	1	1	1	1	3.146	3.993	3.993	2.019
1	1	Exhibitions	Co-owner	0.08	3.146	1	3.146	5	1	3.146	1	5	1	1	2.019	3.146	1	1	1	2.019	1	1	2.019	2.019	2.019	1	1	2.019	1	2.019	2.019	3.146	1
2	3	IT and Research	Marketing Manager	13	3.993	3.146	2.019	3.993	1	1	1	3.146	2.019	2.019	1	3.993	1	1	1	1	1	1	2.019	2.019	1	1	2.019	2.019	1	2.019	2.019	1	1
1	1	Telecoms	General Manager	4	2.019	3.993	3.146	5	2.019	2.019	2.019	3.993	2.019	3.993	2.019	3.993	2.019	2.019	1	3.146	2.019	2.019	2.019	3.146	3.146	2.019	2.019	3.993	2.019	3.993	3.993	3.993	2.019
2	3	Food and Beverage	Financial Manager	5	3.993	2.019	2.019	1	3.146	2.019	2.019	3.146	3.146	3.993	3.146	2.019	3.993	5	2.019	2.019	2.019	3.146	3.146	2.019	3.146	2.019	2.019	3.146	3.146	2.019	2.019	3.146	2.019
2	3	Mining	CEO	3.5	2.019	1	5	3.993	1	1	2.019	2.019	3.146	3.993	2.019	3.146	2.019	3.993	3.146	1	1	2.019	3.993	2.019	3.146	2.019	2.019	2.019	2.019	3.146	3.146	3.993	1
1	1	Media	Owner/manager	15.5	3.146	1	2.019	3.146	1	1	2.019	3.993	1	3.993	2.019	5	2.019	2.019	2.019	1	1	1	2.019	2.019	5	2.019	1	2.019	2.019	3.146	2.019	5	1
3	3	Spatial Information Solutions	Head: HR, Policy & Strategy	8	3.146	2.019	2.019	2.019	2.019	2.019	2.019	2.019	2.019	3.146	2.019	3.993	2.019	2.019	3.146	2.019	2.019	2.019	2.019	2.019	3.146	2.019	2.019	2.019	2.019	2.019	3.146	3.993	2.019
2	2	ICT	Director	15	3.146	1	1	1	1	1	2.019	1	1	5	2.019	2.019	2.019	5	3.993	1	2.019	3.146	1	3.993	3.993	2.019	2.019	1	1	1	1	2.019	1
2	2	Information Technology	Director	5	3.146	1	5	3.146	2.019	2.019	3.993	1	2.019	3.993	1	3.146	3.146	3.993	3.146	2.019	2.019	2.019	3.993	2.019	1	2.019	1	3.993	1	3.146	2.019	3.993	1
2	3	usiness Consulting Services	CEO	8	3.993	1	3.146	5	1	1	1	2.019	1	5	2.019	3.993	1	3.993	3.146	2.019	2.019	1	5	2.019	1	2.019	2.019	1	1	3.146	3.146	5	1
3	3	Manufacturing	Managing Director	21	2.019	1	2.019	2.019	3.146	2.019	2.019	3.993	3.146	3.146	2.019	3.993	3.146	3.993	2.019	2.019	2.019	2.019	3.146	2.019	2.019	2.019	2.019	2.019	2.019	2.019	2.019	3.993	2.019
4	3	utomotive Electrical Systems	ead of Quality and Products	35	2.019	3.993	3.146	3.146	2.019	1	2.019	2.019	2.019	3.146	2.019	3.146	3.993	2.019	2.019	2.019	2.019	2.019	3.146	2.019	3.146	2.019	1	3.146	1	1	2.019	3.146	2.019
1	1	ICT - New media	General Manager	3	2.019	2.019	5	1	1	1	2.019	1	1	3.146	2.019	2.019	2.019	2.019	2.019	2.019	2.019	2.019	3.993	2.019	2.019	2.019	2.019	1	1	1	1	3.146	1
4	3	cturing ,Services (Electrical)	Managing Director	17	1	5	1	1	1	1	1	2.019	1	1	2.019	3.993	1	2.019	1	2.019	1	2.019	5	2.019	3.146	1	2.019	2.019	1	3.993	3.146	3.993	2.019

ANNEXURE F: CORRELATION MATRIX

1	0.238773	0.038574	0.31541	0.030014	0.045167	-0.00814	0.292601	-0.24784	0.159917	-0.21666	0.053932	0.177185	0.115657	-0.0636	0.007032	-0.09551	-0.0168	-0.34929	-0.05426	0.003332	-0.23464	-0.08108	0.049709	-0.08779	0.12304	0.148489	0.133262	0.23286
0.238773	1	-0.06489	0.057781	0.231413	0.113287	-0.16168	0.121298	-0.08184	-0.06787	-0.09336	0.103782	0.030288	-0.27325	-0.40061	0.168515	0.076864	0.128385	-0.14476	0.224823	-0.09414	0.040841	0.16245	0.245337	0.146093	0.074733	0.16391	0.034621	0.357688
0.038574	-0.06489	1	0.374688	-0.04645	0.182319	0.300866	-0.16426	0.03855	0.070859	0.057306	-0.29921	-0.05126	0.048182	0.044644	0.169713	-0.01462	-0.16501	-0.12472	-0.20191	0.014709	0.071414	-0.16056	0.039755	0.140387	0.055683	0.161427	0.17979	-0.12346
0.31541	0.057781	0.374688	1	-0.08212	0.20664	0.100902	0.145061	-0.04563	-0.16139	-0.13127	0.078302	-0.26817	-0.18052	-0.07143	0.200977	-0.04839	-0.32189	-0.1057	-0.1231	-0.0761	-0.14594	-0.40005	-0.1111	-0.07894	0.092307	0.203061	0.196421	0.050376
0.030014	0.231413	-0.04645	-0.08212	1	0.615985	0.144158	0.165029	0.399714	0.001245	0.169399	-0.04414	0.238424	0.09233	0.182236	0.246129	0.168997	0.14029	0.016664	0.194801	0.093014	0.355425	0.15579	0.405002	0.278652	0.179619	0.150549	0.141085	0.477111
0.045167	0.113287	0.182319	0.20664	0.615985	1	0.180841	0.204193	0.247544	0.020812	0.173094	-0.16025	-0.07933	0.024541	0.179551	0.175955	0.203541	0.101815	0.035237	0.103039	0.072533	0.248604	0.017997	0.305541	0.352479	0.056542	0.228556	0.130347	0.320267
-0.00814	-0.16168	0.300866	0.100902	0.144158	0.180841	1	0.154908	0.184188	-0.14457	0.034509	-0.30332	0.007667	-0.01684	0.125647	0.081028	0.283138	-0.17693	-0.09992	-0.20532	-0.00907	0.398144	0.150798	0.160236	0.197872	-0.17465	0.090741	0.035823	0.166443
0.292601	0.121298	-0.16426	0.145061	0.165029	0.204193	0.154908	1	0.013609	-0.09598	-0.12065	0.22816	0.012778	-0.12485	-0.12167	0.101244	0.001998	-0.18732	-0.32332	-0.18157	-0.05228	-0.0332	0.148963	0.272722	0.061995	0.194367	0.194292	0.128301	0.290849
-0.24784	-0.08184	0.03855	-0.04563	0.399714	0.247544	0.184188	0.013609	1	0.097723	0.140023	0.002187	0.056718	0.177753	0.256776	0.006926	0.086123	0.07694	0.109625	0.002101	-0.00905	0.203172	0.024879	0.289851	0.352547	0.003746	-0.02852	0.060391	0.067474
0.159917	-0.06787	0.070859	-0.16139	0.001245	0.020812	-0.14457	-0.09598	0.097723	1	-0.09525	-0.01694	0.15478	0.528678	0.270941	-0.03804	0.171779	0.28166	0.063538	0.170794	0.172534	-0.11298	0.049987	0.113365	0.121259	0.094616	0.155389	0.085301	-0.04933
-0.21666	-0.09336	0.057306	-0.13127	0.169399	0.173094	0.034509	-0.12065	0.140023	-0.09525	1	-0.1523	0.104376	0.151964	0.09181	0.267759	0.257513	0.199413	0.071751	0.093996	0.150088	0.387556	0.241283	0.12119	0.204536	-0.03801	0.223568	0.184269	0.098991
0.053932	0.103782	-0.29921	0.078302	-0.04414	-0.16025	-0.30332	0.22816	0.002187	-0.01694	-0.1523	1	-0.06166	-0.02713	0.026701	-0.21553	-0.27584	-0.2862	0.003627	0.027254	0.021303	-0.34202	-0.19165	-0.06831	-0.21558	0.352987	0.051558	0.153646	0.058431
0.177185	0.030288	-0.05126	-0.26817	0.238424	-0.07933	0.007667	0.012778	0.056718	0.15478	0.104376	-0.06166	1	0.408598	0.182167	0.032492	0.197369	0.406719	-0.01709	0.144354	0.220975	-0.01133	0.093426	0.163029	0.057156	0.027832	0.019944	0.067627	0.233385
0.115657	-0.27325	0.048182	-0.18052	0.09233	0.024541	-0.01684	-0.12485	0.177753	0.528678	0.151964	-0.02713	0.408598	1	0.434942	0.056562	0.25402	0.415971	0.033703	0.123621	0.001661	0.043652	0.099298	0.095053	0.157793	0.265603	0.120553	0.214597	0.065562
-0.0636	-0.40061	0.044644	-0.07143	0.182236	0.179551	0.125647	-0.12167	0.256776	0.270941	0.09181	0.026701	0.182167	0.434942	1	-0.07647	0.007655	0.174381	0.179481	0.013581	0.158614	0.012676	0.078997	0.072122	0.129926	0.047762	-0.13549	0.201236	0.152702
0.007032	0.168515	0.169713	0.200977	0.246129	0.175955	0.081028	0.101244	0.006926	-0.03804	0.267759	-0.21553	0.032492	0.056562	-0.07647	1	0.33036	0.253286	-0.02925	0.239648	-0.01745	0.209173	0.351536	0.29226	0.068419	0.238899	0.434941	0.204305	0.251605
-0.09551	0.076864	-0.01462	-0.04839	0.168997	0.203541	0.283138	0.001998	0.086123	0.171779	0.257513	-0.27584	0.197369	0.25402	0.007655	0.33036	1	0.355295	0.147561	0.125928	-0.12779	0.479504	0.213723	0.147803	0.277838	-0.11093	0.057085	0.021773	-0.0079
-0.0168	0.128385	-0.16501	-0.32189	0.14029	0.101815	-0.17693	-0.18732	0.07694	0.28166	0.199413	-0.2862	0.406719	0.415971	0.174381	0.253286	0.355295	1	0.239572	0.352999	0.162844	0.045461	0.254181	0.136805	0.297759	0.056075	-0.06748	-0.06059	0.071611
-0.34929	-0.14476	-0.12472	-0.1057	0.016664	0.035237	-0.09992	-0.32332	0.109625	0.063538	0.071751	0.003627	-0.01709	0.033703	0.179481	-0.02925	0.147561	0.239572	1	0.167656	0.016979	-0.06136	0.067163	-0.09964	-0.09943	-0.01221	-0.10018	0.048277	-0.19005
-0.05426	0.224823	-0.20191	-0.1231	0.194801	0.103039	-0.20532	-0.18157	0.002101	0.170794	0.093996	0.027254	0.144354	0.123621	0.013581	0.239648	0.125928	0.352999	0.167656	1	0.150216	0.056472	0.271763	0.153378	0.101285	0.225433	0.221345	-0.08286	-0.08651
0.003332	-0.09414	0.014709	-0.0761	0.093014	0.072533	-0.00907	-0.05228	-0.00905	0.172534	0.150088	0.021303	0.220975	0.001661	0.158614	-0.01745	-0.12779	0.162844	0.016979	0.150216	1	-0.10105	0.061234	-0.00821	-0.0392	0.037934	-0.0164	0.275553	0.20422
-0.23464	0.040841	0.071414	-0.14594	0.355425	0.248604	0.398144	-0.0332	0.203172	-0.11298	0.387556	-0.34202	-0.01133	0.043652	0.012676	0.209173	0.479504	0.045461	-0.06136	0.056472	-0.10105	1	0.314694	0.338466	0.42022	0.068005	0.055895	0.108969	0.097515
-0.08108	0.16245	-0.16056	-0.40005	0.15579	0.017997	0.150798	0.148963	0.024879	0.049987	0.241283	-0.19165	0.093426	0.099298	0.078997	0.351536	0.213723	0.254181	0.067163	0.271763	0.061234	0.314694	1	0.315532	0.245119	0.096448	0.229367	0.003319	0.341741
0.049709	0.245337	0.039755	-0.1111	0.405002	0.305541	0.160236	0.272722	0.289851	0.113365	0.12119	-0.06831	0.163029	0.095053	0.072122	0.29226	0.147803	0.136805	-0.09964	0.153378	-0.00821	0.338466	0.315532	1	0.348383	0.395101	0.372624	0.039821	0.328759
-0.08779	0.146093	0.140387	-0.07894	0.278652	0.352479	0.197872	0.061995	0.352547	0.121259	0.204536	-0.21558	0.057156	0.157793	0.129926	0.068419	0.277838	0.297759	-0.09943	0.101285	-0.0392	0.42022	0.245119	0.348383	1	0.198283	0.004858	-0.01018	0.083294
0.12304	0.074733	0.055683	0.092307	0.179619	0.056542	-0.17465	0.194367	0.003746	0.094616	-0.03801	0.352987	0.027832	0.265603	0.047762	0.238899	-0.11093	0.056075	-0.01221	0.225433	0.037934	0.068005	0.096448	0.395101	0.198283	1	0.28457	0.234115	0.053921
0.148489	0.16391	0.161427	0.203061	0.150549	0.228556	0.090741	0.194292	-0.02852	0.155389	0.223568	0.051558	0.019944	0.120553	-0.13549	0.434941	0.057085	-0.06748	-0.10018	0.221345	-0.0164	0.055895	0.229367	0.372624	0.004858	0.28457	1	0.084594	0.254929
0.133262	0.034621	0.17979	0.196421	0.141085	0.130347	0.035823	0.128301	0.060391	0.085301	0.184269	0.153646	0.067627	0.214597	0.201236	0.204305	0.021773	-0.06059	0.048277	-0.08286	0.275553	0.108969	0.003319	0.039821	-0.01018	0.234115	0.084594	1	0.267209
0.23286	0.357688	-0.12346	0.050376	0.477111	0.320267	0.166443	0.290849	0.067474	-0.04933	0.098991	0.058431	0.233385	0.065562	0.152702	0.251605	-0.0079	0.071611	-0.19005	-0.08651	0.20422	0.097515	0.341741	0.328759	0.083294	0.053921	0.254929	0.267209	1

ANNEXURE G

NCSS COMMON FACTOR ANALYSIS OUTPUT:

Descriptive Statistics Section

Variables	Count	Mean	Standard Deviation	Communality
Q7	52	2.832022	0.9994373	0.395347
Q9	52	2.483064	1.219205	0.496602
Q11	52	3.158312	0.9991632	0.426629
Q13	52	3.494911	1.134759	0.565316
Q15	52	1.966234	0.9242377	0.582644
Q17	52	1.906466	0.9221899	0.426236
Q19	52	1.9937	0.842248	0.435928
Q21	52	2.636056	1.088194	0.416717
Q23	52	1.839303	0.7931484	0.406116
Q25	52	3.062927	1.065433	0.328514
Q27	52	2.134418	0.7420039	0.231031
Q29	52	3.191108	0.8855928	0.514239
Q31	52	2.329401	1.020195	0.401795
Q33	52	2.611731	1.051252	0.536906
Q35	52	2.048525	0.8656038	0.457352
Q37	52	2.461414	1.139926	0.586420
Q39	52	1.897974	0.717843	0.382646
Q41	52	2.013674	0.6664315	0.594551
Q43	52	2.875736	1.015599	0.239546
Q45	52	2.390491	0.8541612	0.406419
Q47	52	2.571732	0.9564382	0.173456
Q49	52	2.035596	0.6539922	0.553868
Q51	52	1.993954	0.9845338	0.387428
Q53	52	2.421502	1.041196	0.438848
Q55	52	1.907658	0.7322181	0.311369
Q57	52	2.432575	1.031975	0.531681
Q59	52	2.601811	0.9925137	0.412650
Q61	52	3.402266	1.069795	0.330325
Q63	52	1.970661	0.9675077	0.690885

Eigenvalues after Varimax Rotation

No.	**Eigenvalue**	**Individual Percent**	**Cumulative Percent**	**Scree Plot**
1	2.653670	19.71	19.71	||||
2	2.246560	16.69	36.40	||||
3	2.264268	16.82	53.21	||||
4	2.076690	15.42	68.64	||||
5	1.669754	12.40	81.04	|||
6	1.750524	13.00	94.04	|||
7	0.887463	6.59	100.63	||
8	0.758972	5.64	106.27	||
9	0.550643	4.09	110.36	|
10	0.439543	3.26	113.62	|
11	0.421676	3.13	116.76	|
12	0.312338	2.32	119.08	|
13	0.226075	1.68	120.75	|
14	0.180972	1.34	122.10	|
15	0.169846	1.26	123.36	|
16	0.066229	0.49	123.85	|
17	-0.001254	-0.01	123.84	|
18	-0.046721	-0.35	123.50	|
19	-0.091140	-0.68	122.82	|
20	-0.131435	-0.98	121.84	|
21	-0.162143	-1.20	120.64	|
22	-0.261570	-1.94	118.70	|
23	-0.271240	-2.01	116.68	|
24	-0.301964	-2.24	114.44	|
25	-0.341296	-2.53	111.90	|
26	-0.354423	-2.63	109.27	|
27	-0.368451	-2.74	106.53	|
28	-0.399045	-2.96	103.57	|
29	-0.480753	-3.57	100.00	|

Factor Structure Summary after Varimax Rotation

Factors

Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**	**Factor 6**
Q49	Q63	Q33	Q57	Q11	Q23
Q29	Q21	Q31	Q45	Q13	Q15
Q39	Q7	Q25	Q37		Q17
Q51	Q9	Q35	Q59		Q35
Q37	Q43	Q61	Q53		
Q41	Q15	Q39			
Q27		Q47			

Communalities after Varimax Rotation

Variables	**Factors** **Factor1**	**Factor2**	**Factor3**	**Factor4**	**Factor5**
1	0.034940	0.231162	0.032285	0.005335	0.007645
2	0.013452	0.204597	0.025629	0.141247	0.051323
3	0.014470	0.015565	0.011234	0.000094	0.383132
4	0.041356	0.040834	0.013588	0.027048	0.425147
5	0.031704	0.180359	0.075423	0.025008	0.010081
6	0.036594	0.117074	0.017129	0.016190	0.056357
7	0.133674	0.020344	0.004435	0.069059	0.158089
8	0.013840	0.346995	0.025640	0.005451	0.000109
9	0.006086	0.013487	0.004731	0.002070	0.004056
10	0.000576	0.017354	0.257559	0.041998	0.001127
11	0.160560	0.021204	0.022523	0.013023	0.000037
12	0.413148	0.021689	0.000414	0.048384	0.011568
13	0.015059	0.003365	0.265493	0.000691	0.089946
14	0.012583	0.020764	0.462068	0.002794	0.001722
15	0.005176	0.003229	0.249246	0.025754	0.011178
16	0.194069	0.007807	0.005544	0.306603	0.066551
17	0.353929	0.000632	0.016015	0.005174	0.000780
18	0.186423	0.038895	0.179637	0.040147	0.141108
19	0.004149	0.188310	0.031877	0.000312	0.006802
20	0.017068	0.015683	0.012002	0.320994	0.035633
21	0.000022	0.004191	0.165167	0.002959	0.000844
22	0.421346	0.003647	0.018333	0.003460	0.002241
23	0.279346	0.027387	0.000507	0.036207	0.043775
24	0.050162	0.065647	0.004823	0.208410	0.007833
25	0.153764	0.000105	0.003588	0.016675	0.003443
26	0.026764	0.017693	0.034543	0.424237	0.010756
27	0.008838	0.054407	0.001780	0.271689	0.075932
28	0.002881	0.020792	0.221182	0.013958	0.062464
29	0.021693	0.543340	0.101873	0.001720	0.000074

	Factors	
Variables	**Factor6**	**Communality**
1	0.083980	0.395347
2	0.060354	0.496602
3	0.002135	0.426629
4	0.017342	0.565316
5	0.260069	0.582644
6	0.182892	0.426236
7	0.050327	0.435928
8	0.024682	0.416717
9	0.375686	0.406116
10	0.009900	0.328514
11	0.013683	0.231031
12	0.019037	0.514239
13	0.027241	0.401795
14	0.036977	0.536906
15	0.162769	0.457352
16	0.005846	0.586420
17	0.006116	0.382646
18	0.008341	0.594551
19	0.008095	0.239546
20	0.005038	0.406419
21	0.000273	0.173456
22	0.104842	0.553868
23	0.000206	0.387428
24	0.101973	0.438848
25	0.133794	0.311369
26	0.017689	0.531681
27	0.000004	0.412650
28	0.009047	0.330325
29	0.022186	0.690885