

**UNIVERSITY OF KWAZULU-NATAL**

**PRODUCTION STRATEGY EMPLOYED BY SMALL, MEDIUM AND MICRO  
ENGINEERING ENTERPRISES IN THE JACOBS AREA IN DURBAN**

**By**

**Abia Rakoma  
210515646**

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of  
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**Supervisor: Alec Bozas**

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## DECLARATION

I **Abia Rakoma** declare that:

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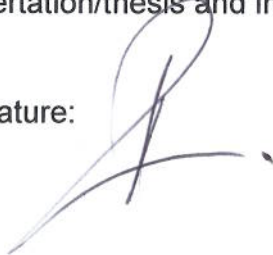
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## **Abstract**

This study investigated the production strategies employed by the small, medium and micro enterprises (SMMEs) in the Jacobs area in Durban. The research on the production strategies employed by SMMEs supports the government's initiative of growing small businesses to help create employment and contribute to poverty alleviation in the country. This study is also significant as its recommendations will be of value to SMME owners and prospective SMME owners. The research methodology employed in this study is quantitative research methodology. The questionnaire used in this study elicited views of seventeen questions designed from the literature review. The questionnaire used the five point Likert scale for question two to seventeen, while in question one respondents had to choose from a list of production strategies. The questionnaire was divided into five parts with each part of the questionnaire linked to one of the five objectives of the study. A sample of 30 registered SMMEs in the Jacobs area was used. Though this is a small scale study, if its findings and recommendations are followed by the SMME owners they will add to their businesses an abundance of value. The findings from the field work provided by the respondents to the questionnaire were consistent with the findings in the literature review. The key findings of the study were that there are challenges when implementing production strategies; however the effectiveness, benefits and the risks of not having a production strategy in place far outweigh those challenges, furthermore it was found that with good planning, training and communication the effect of those challenges can be mitigated. A rigorous study on SMMEs that do not use production strategies was recommended as a suggestion for further research to establish if their productivity and profitability were the same as those SMMEs that employed production strategies.

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# **CHAPTER ONE**

## **OVERVIEW OF THE STUDY**

### **1.1 Introduction**

Manufacturing activities are often regarded as the foundation of the financial system in the country and the key drivers of employment creation and growth (Kwon & Wu, 2005). This statement is conceded to by Davies (2001) when he stated that in South Africa the manufacturing sector is one of the leading contributors to the gross domestic products (GDP) and also has the most potential to create employment and enhance economic growth. Within South Africa small medium and micro enterprises (SMMEs) are regarded as important drivers of economic activities (Bernard, Kritizinger & Kruger, 2011). Furthermore, it is estimated that SMMEs contribute 52% to 57% to GDP in South Africa and an approximate 61% to employment (Bernard, et al., 2011).

With the above statements in mind which state the importance of SMMEs in the country and more specifically in South Africa, this chapter gives an introduction of why this study was embarked upon against the backdrop of the importance of SMMEs mentioned. The problem statement outlines the importance and benefits of SMMEs more specifically in South Africa and the question that brought this study to life is posed. Some of the barriers faced by the SMME community at large and more specifically the SMMEs in Jacobs's area in Durban are also covered under the problem statement. The motivation of the study outlines the benefits of the study and those who will benefit from the outcome of this study. The rest of the chapter covers the focus of the study, the objective of the study, the questions that the study sought to answer, the research methodology that was utilized and finally the structure of the study is outlined.

### **1.2 Problem Statement of the Study**

Small medium and micro enterprises (SMMEs) are now considered to be one of the critical drivers of economic growth and employment creation in South Africa (Sha, 2006). Bernard, et al. (2011), state that policymakers see SMMEs as the ideal way to boost sustainable development worldwide. SMMEs are considered to be critical as instruments to enhance growth and the development of the South African economy;

furthermore they are a pivotal link to economic empowerment and job creation in disadvantaged communities (South Africa Survey, 2007).

Small, medium and micro enterprises (SMMEs) are playing a progressively more important part in stimulating economic activities, employment creation and growth; however this important role is compromised by the limited existence (usually five years) of most SMMEs owing to various challenges (Bernard, et al., 2011). Naidoo and Urban (2010), argue the relationship between SMME sustainability and operations skills which also involves the use of production strategies, and their argument is that amongst the many reasons that SMMEs cease to exist is because of a deficit in management skills and the lack of use of proper decisions making tools. Bernard, et al. (2011), argues that technical and operational competences coupled with good decisions are the commands required to facilitate the implementation of the business vision and strategy.

In South Africa SMMEs stimulate economic growth and job creation; however they still encounter challenges, and those challenges affect their business performance and the ability to realize their outmost potential. Poor management of these challenges could ultimately lead to business failure (Naidoo & Urban 2010). As Bernard, et al. (2011) state that immature businesses have a higher prevalence to failure when compared to older and more established businesses. Sha (2006) mentions some of the challenges facing SMMEs in South Africa, she states that these challenges are the deficient in managerial skills, access to technology complexity, limited access to finance, scarcity of skilled resources, poor location decisions, exorbitantly high costs of start-up, complex legal and regulatory requirements and high barriers to entry. Naidoo and Urban (2010) argues that these challenges are so prevalent and fatal amongst SMME because owners of these businesses neglect the use of technology and production strategies in their strategy and decision making processes.

Business theorists have defined business strategy in various ways, however with a common argument in mind. Grant (2010) claims that the means by which individuals or organisations achieve their objectives is strategy. Hough (2011) states that strategy is management's action plan for running the business and conducting operations. Porter

(1996) defines strategy as the process where a company defines its position, makes tradeoffs and create shape among its activities. Baltzan and Phillips (2010) further suggest that the time for leaders to rely on charisma, authority, guesswork or intuition to lead organisations is long gone. They state further that gut feels lacks credibility and can lead to disastrous decisions if used by business leaders.

If literature let known that charisma, authority, guesswork and gut feel are not good enough to be used by managers of businesses and more specifically for this study, in the engineering sector, and presents that only well research productions strategies provide enhanced productivity and profitability to organisations, then the question that begs an answer is whether or not SMMEs in the Jacobs area in Durban are using well researched production strategies to maximize their productivity and profitability?

### **1.3 Motivation for the Study**

Naidoo and Urban (2010) state that SMME owners disregard the importance of technology and strategy although these factors play an important role in determining which businesses will be successful and which will fail, because without proper and informed decision making businesses fail. It is against this backdrop that this study is deemed necessary. In this study the production strategies that are available are outlined and also what strategies big businesses are using to sustain, improve and achieve a competitive edge in their markets.

The motivation is providing a platform to teach the SMME owners about how they can improve their businesses and enhance productivity, furthermore the following stakeholders should benefit from the outcome of this study:

- SMME owners / managers, who will benefit from understanding the benefits of using production strategies and how these strategies can be applied in small businesses.
- Service providers, who will understand the benefits of providing tailor made production strategies for small businesses which will be easy and cheap to implement.

- Educators or business institutions that will benefit by developing courses to target SMME owners on educating them about the importance of using production strategies.
- Future start-ups that will benefit from understanding the benefits of including and designing good production strategies into their overall business strategy which will give them a competitive edge earlier in their business lives.

#### **1.4 Focus of the Study**

The focus of this study is the SMMEs in the engineering sector in the Jacobs area in Durban because of the dense population of SMMEs in that area of which most are start-ups that face a risk of failing if they do not find a competitive edge as most produce the same engineering commodities. The strategy segment that the study focuses on is the production strategies that are already used by other businesses and those which have provided improvements to businesses utilizing them. This is because one of the hypotheses of this study is that production strategies are applicable to all types and sizes of businesses as long as they are implemented and used accordingly. That question is addressed in the study and the hypothesis proven.

#### **1.5 Research Question**

This study addressed the following research problem questions:

- Which production strategies are employed by SMMEs in the engineering sector in the Jacobs area?
- What challenges do SMMEs encounter in their quest to introduce or implement production strategies?
- Do production strategies provide effectiveness in the SMMEs operations in the engineering sector?
- What benefits do SMMEs derive from implementing and using a specific production strategy?
- What risks does SMMEs encounter for not having implemented production strategies?

## **1.6 Objectives**

The following objectives were addressed by the study:

- To identify what production strategies are employed by SMMEs.
- To identify and evaluate challenges experienced by SMMEs in implementing production strategies.
- To review and evaluate the effectiveness of production strategies in the SMMEs operations.
- To determine the overall benefits that production strategies provide to SMMEs in the engineering sector in the Jacobs area.
- To determine the risks related with not having production strategies in place.

## **1.7 Research Methodology**

Sekaran and Bougie (2010) define business research as a planned, methodical, data-based, decisive, objective, scientific inquiry or investigation with an aim of finding answers or solutions to a specific problem. They further state that research provides information needed by managers to make informed business decisions.

The problem that is investigated in this study is a perceived problem; therefore it was of importance that the validity of the problem was established. The validity of the problem was established through the literature, thereafter the study continued intensely. The methodology adopted for this study was a methodological and contextual type review as this study is not a historical review of strategies used by SMMEs but a study to determine if SMMEs are using production strategies. This is a quantitative study hence the questionnaire was used for data collection. Furthermore due to the focused nature on hypothesis testing, reliability and validity of quantitative research it was used to validate and research the supposition.

## **1.8 Location of Study**

The population focus of this study is the SMME's in the engineering sector in the Jacobs area in Durban.

## **1.9 Sampling**

A sample is the selection of a subgroup from a larger group. The sample is derived from the larger group referred to as the population. A sample is taken in order to draw conclusions about the sample and generalise it back to the population (Sekaran & Bougie, 2010).

A probability sampling method was used in this study because the elements in the population had a known chance of being chosen as subjects in the sample. The type of probability sampling used in this study is area sampling because it was less expensive when compared to most probability sampling designs, the SMMEs targeted are located in the same area and it is not dependent on the sampling frame. A convenient sample of 30 SMMEs was used for data collection of this study from 129 registered engineering businesses in the Jacobs area, because of the researcher's limitation in excess to a large number of SMMEs in the engineering sector. The list of the SMME's was obtained from SEDA eThekweni. This type of sampling is not easily defensible as being representative of populations due to potential subjectivity of researcher, therefore to verify the validity of the study, Pearson correlation coefficients and a simple linear regression analysis was conducted. The complete methodology used for this study is discussed extensively in Chapter Three.

## **1.10 Chapter Outline**

The following section outlines the structure of the study to ensure that it flows and makes for an easy read and also to ensure that the reader gets maximum benefit from this study as it is intended.

### **Chapter One**

This chapter outlines the problem that this study sought to address as well as the benefits that the targeted stakeholders will obtain from the study. Furthermore the focus of the study is outlined together with the research question and the research methodology adopted. The objectives and the questions the study sought to answer are outlined as well in this chapter and finally the structure of the overall study is drawn out.



## Chapter Two

This chapter provides a theoretical background of the production strategies. The chapter begins by giving a background of the SMMEs and production strategies. It then looks at the constraints that impede SMMEs by utilizing the PESTEL model. The chapter concludes by outlining the production strategies that are used by other businesses and which have proven to be effective in improving productivity and profitability, moreover the benefits and implementation steps are outlined in this chapter.

## Chapter Three

The research methodology that was utilized in the study is outlined in this chapter. The chapter deliberates about issues of the participants and location of the study, including the research approach that was employed in this study. Sampling, data collection and data analysis are outlined and deliberated in this chapter. Data collected with the methodology outlined in this chapter is analysed in chapter four.

## Chapter Four

This chapter is about the presentation and detailed analysis of the data collected from the target population of this study. The data is presented in descriptive format which presents the data in tables and text. The second is the presentation of data through correlation and regression analysis which is presented in the appendices.

## Chapter Five

This chapter provides the conclusion and recommendations to the results presented in chapter 4. The conclusion and recommendations are linked to objective. Also the suggestions for further research are made and the chapter closes with the closing remarks.

### **1.11 Summary**

This chapter gives an introduction to this study; it also provides the rationale for the study. The research questions and objectives of the study are also discussed. The chapter finishes with providing a structure for the study and what each chapter covers. Chapter Two which follows covers the literature review, the theory behind SMMEs and production strategies.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The literature behind the study on production strategies employed by Small, Medium and Micro Enterprises (SMMEs) in the engineering sector is detailed in this chapter. The literature review first gives a brief background about the role and importance of SMMEs in South Africa. The outcomes on the trends of SMMEs in the manufacturing sector done on prior researches are also discussed briefly. The chapter also focuses on the constraints that are faced by the SMMEs in South Africa and the factors that restrict them from reaching their full potential. The focus then shifts to the strategies that SMMEs can employ to improve their productivity and counter the constraints that they encounter. Details of the production strategies used by big businesses are given, also details of how these strategies help to improve the productivity of these enterprises is discussed. The chapter closes by summarizing the constraints and strategies that SMMEs can employ to overcome the constraints that they are faced with in their operations.

#### **2.2 Background**

The encouragement of SMMEs in South Africa and many other countries is receiving focus and substantial attention (Mahadea & Pillay, 2008). This great deal of emphasis placed on SMMEs is due to their potential to generate employment thus contributing to poverty alleviation (Booyens, 2011). According to Mahadea and Pillay (2008), SMMEs have a potential of creating job, they contribute extensively to economic growth of most countries and to the individual prosperity of SMME owners. SMMEs according to Kesper (2001) are able to solve the persistent problem of unemployment while being highly efficient in activating domestic competition by creating market niches. However this important role is compromised by the limited existence (usually five years) of most SMMEs owing to various challenges faced by SMMEs on a daily basis (Bernard, et al., 2011).

### **2.3 SMMEs in the Manufacturing Sector**

According to the research done by Kesper (2001) on SMMEs in the manufacturing sector in four South African regions, it is widely agreed that SMMEs in the manufacturing sector within South Africa are an important element of economic activity and employment growth. Kesper (2001) research findings can be summarized as follows; the turnover growth of SMMEs in the manufacturing sector generally slowed down since 1998 in the four regions investigated. However the majority of the sampled SMMEs showed an increase in sales with no related increase in employment growth and these are projected to prevail in the future. SMMEs relate these negative trends to external factors that are constraining them from reaching their full potential. Kesper (2001) findings further state that there is a lack of internal competencies within the manufacturing SMME community to overcome these constraints. Furthermore they do not have the capacity and resources necessary to serve new markets and grow their businesses to a level where they will be able to improve their profits and increase employment growth.

The research outcomes by Kesper (2001) pose a question mark of what constraints do SMMEs encounter and also if these constraints are internal or external to SMMEs. The following section looks at the constraints facing SMMEs and their nature in order to get closer to an understanding of what constraint SMMEs from reaching their full potential.

### **2.4 Factors Constraining SMME Growth and Productivity**

The constraints that SMMEs have to contend with on a daily basis come from both the micro and macro environments that SMMEs operate within. According to Clover and Darroch (2005), socioeconomic and institutional factors like macroeconomics policies and personal characteristics of the entrepreneur for instance can directly affect the success of the enterprise and its development. SMMEs are likely to encounter constraints on all business operations functional areas, and these areas are management, marketing, operations and finance (Clover & Darroch, 2005). To clearly identify the major source of constraints, the literature on constraints is split into macro and micro environmental constraints. The different functional areas of business

operations are taken into consideration within the macro and micro environmental literature.

## **2.4.1 Macro Environmental Constraints**

Macro environmental factors are factors that affect the decisions of business managers in how to run their businesses. Tax changes, new laws, trade barriers, demographic changes and government policies are examples of macro environmental factors that affect business decisions. To categorise the factors that constraint SMME performance the PESTEL model is used and thereafter each of the factors is analysed with respect to its relevance to the SMMEs in the manufacturing sector in Jacobs Durban.

### **2.4.1.1 PESTEL Model**

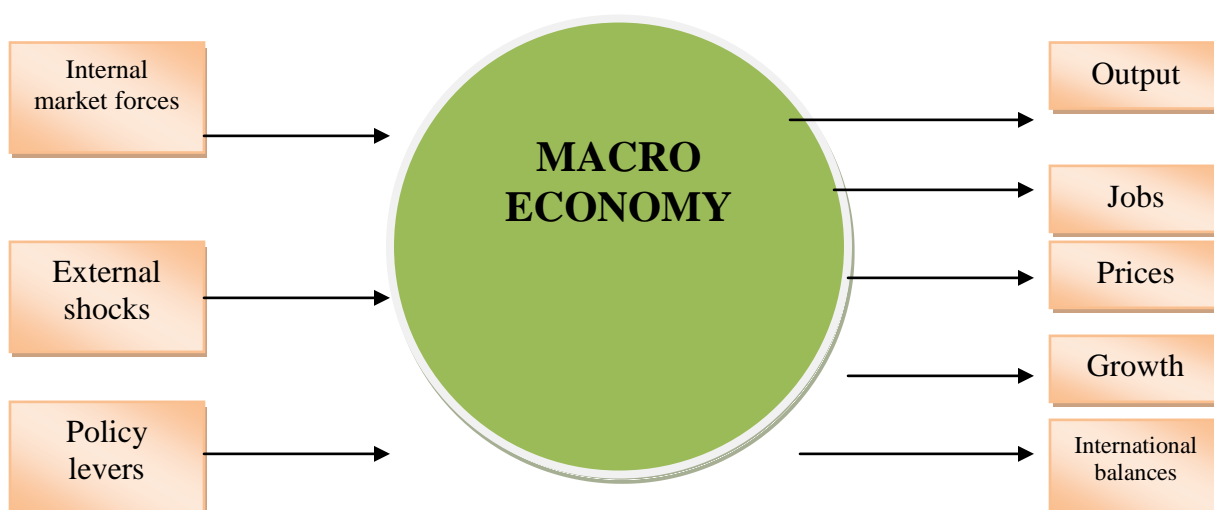
#### **2.4.1.1.1 Political Factors**

Political factors refer to government policies, for instance the degree of intervention that the government has in the economy (Clover & Darroch, 2005). It also speaks to the types of goods and services that the government wants to provide and the extent that it believes in subsidizing firms and also the priorities in terms of business support. The factors that constraint business survival and growth as identified by SMMEs are lack of investment or start – up capital, not enough property rights and deficiency of title deeds which poses a challenge of accessing investment capital due to a lack of collateral requires (Clover & Darroch, 2005).

The South African labour legislation is also cited by SMME owners as being excessively complex and more inclined towards businesses with less labour relative to investment engaged (Clover & Darroch, 2005). Political decisions also impact the vital areas for business like the training of the workforce, whilst the access to government's skills training is a key factor for SMMEs as it is one of the determinants between success and failure (Fuller, 2003). Training is very critical for SMMEs in the engineering sector as technology in engineering keeps changing and small businesses can not afford to subsidise training all the time, consequently failure to access training funds from the government could spell disaster for some of the SMMEs.

### 2.4.1.1.2 Economic Factors

The determinants of macroeconomic outcomes are depicted by three separate forces; these determinants of performance include the internal market forces, the external shocks and the policy levers (Schiller, 2009). The following figure illustrates how the primary outcomes of the macro economy which are output of goods and services, jobs, prices, economic growth and international balances result from the interplay of these forces.



### 2.1: The Macro Economy

Source: Adapted from Schiller, R.S., 2009: 235. Essentials of Economics. 7<sup>th</sup> ed. New York: McGraw – Hill Irwin.

Government intervention in economics is necessary to ensure that answers are provided to the what, how and for who questions (Schiller, 2009). The questions that the government intervention answers are what goods to produce, how to produce those goods and for whom should those goods be produced for. As government intervenes, changes happen in the economy and these include interest rates changes, taxation changes, economic growth, inflation and exchange rates. And these changes have the following effect on business (Schiller, 2009):

- Higher interest rates may discourage investment because in such economic conditions it costs more to borrow and make it hard for businesses especially SMMEs to acquire well needed capital injection.
- Exporting becomes difficult when the currency is strong because its price in terms of foreign currency exchanges is increased, while making importing cheaper and creating competition for local manufacturers.
- An inflationary environment usually provokes higher wage demands from employees and raises the costs for businesses, and it is usually difficult to recover those costs in an inflationary economy as demand usually declines as a result of price increases.
- While in contrast higher national income growth might increase demand for a firm's products and in return boost the SMMEs in the manufacturing sector.

#### **2.4.1.1.3 Social Factors**

The changes in social trend impacts the demand for products, the availability and keenness of individuals to work Kloss (1999, cited in Riddell, 2006). Social trends are a continuous change in social relations and social structure in due course. Trends are the combined consequences of various uncoordinated individual and group actions Kloss (1999, cited in Riddell, 2006).

Barnes (2008), states that the future of the nation depends on it children and the fundamental connection to the future of social, economic and political development of South Africa is the education of children. To demonstrate this point Riddell (2006) uses the human capital model, the heart of the theory is that investments are made in human resources in order to improve productivity, which also increases the individual's prospect for employment and earnings (Riddell, 2006). The skills acquired through schooling and/or work experience increases the individual's value to employers and therefore their future earnings (Riddell, 2006). He further states that there are private and social returns to human capital, and clarifies that as follows:

- Signalling or screening model: Education has no effect on the individual's productivity; it acts as an indication of the productive capability of the individual (Riddell, 2006).

- Job-worker matching or information-based models: Education provides individuals with information about their comparative advantages in the market, the types of careers and jobs they are likely to succeed in. Riddell (2006) further states that education is a best predictor of who gets further on.

However, somewhat low levels of public funding at tertiary education level translate into higher fees, in effect shutting out the poor and reducing the capability of universities to increase social and economic development (Letseka & Maile, 2008). Poverty restricts children and youth from attending school. In South Africa there is a 15% graduation rate which is one of the lowest in the world, this is of great concern considering the shifts that has taken place in job market and shortage of high level skills, and this is likely to act as a major obstacle to achieving economic development goals (Letseka & Maile, 2008). These factors stated in the above literature means that it becomes difficult to find skilled people who are readily employable. This situation compound the problems of SMMEs in the engineering sector since the sector required highly skilled individual due to the technology used in the sector.

#### **2.4.1.1.4 Technological Factors**

Some challenges specifically facing SMMEs in South Africa are stated by Sha (2006) as the lack of managerial competence and skill, difficulty in gaining access to technology and limited access to finance. SMME owners amongst their many challenges disregard the importance of technology and in particular production strategies which can help them make more informed decisions. Production strategies should play an important role in determining which businesses becomes successful and which one fails, because without proper and informed decision businesses fail (Nyalungu, 2011).

On other area that is neglected by businesses which complements production strategies is business intelligence tools (BI). Business theorists have defined business intelligence (BI) in various ways, however with a common argument in mind. (Nyalungu, 2011), describes it as the integration of intellectual capital to organisational processes, (Baltzan & Phillips, 2010) state that BI are tools used to gather, analyse data to support decision making. The statements above make it apparent that BI tools are crucial in providing

truthful and objective information which provides transparency, and that transparency improves confidence, enable managers to put things into perspective and allow them to make informed decisions.

Furthermore, for businesses to differentiate their companies and focus their efforts to create sustainable and competitive advantage new technologies are required (Nyalungu 2011). Technology controls all aspects of the global marketplace; it drives innovation, affects partnership and business stakeholder relationship (Nyalungu, 2011). Software a vital part of information technology has provided a platform to organisations to introduce new products to the market quicker, thanks to the advancement in design and manufacturing technology. An example of this is mass customization which provides producers with an ability to produce a variety of products using the same basic design and production equipments Hellriegel, et al. (2010, cited in Nyalungu, 2011).

Businesses neglecting the importance of technology in this era of high technology are most likely to fail as stated above. This danger is even bigger in the engineering sector where technology drives the businesses to produce their products quicker and better.

#### **2.4.1.1.5 Environmental Factors**

Businesses are not independent or secluded from the internal and external environment within which they function. The interface that firms have with their formal and informal institutions determines the environment that SMMEs operate in daily (Mahadea & Pillay, 2008). Negative factors in that environment make running a business difficult while raising business running cost. These negative factors can be caused by excessive regulations and red tape, socio-economic conditions, legal restrictions and lack of reliable infrastructure services (Mahadea & Pillay, 2008). The other factor that is a constraint to business and SMMEs in particular according to Mahadea and Pillay (2008) is the fact that Sub-Saharan Africa is a high cost, high risk place to run a business when compared with other developing countries.

The other factor that is a hindrance to business, especially in South Africa where there is close to 30 percent unemployment is crime. Crime affects businesses directly and indirectly through the theft of property, money, reduced business confidence and loss of



investments (Mahadea & Pillay, 2008). They further state that according to the report commissioned by the presidency in 2008, over half of the small businesses in South Africa have experienced crime which has lead them to be reluctant in expanding or employing more labour.

The prevailing climate changes that are caused by global warming are of great focus in the world today which makes the external factor an issue of considerable importance to businesses today. The main debate is how are the governments of the world going to regulate the environmental impact because each country imposes different environmental laws and standards to its own producers. Furthermore, during the inter-country trade process, countries import and export the embodiment of the production processes from other countries (Mahadea & Pillay, 2008). The key point here is being that in Africa as well as in other developing areas of the world, the environmental harm is not necessarily caused by businesses in those countries but rather by misguided government policies (Environmental and trade; A handbook, 2000). It is these environmental policies that constraint the growth and productivity of SMMEs.

#### **2.4.1.1.6 Legal Factors**

Legal factors talk to the legal environment that firms operate under. Entrepreneurs are driven by the need for freedom and to conduct their own affairs and to be their own bosses, this is one of the reasons why they enter self employment. However, this freedom is soon eroded as they become submissive to customer needs, while they still have to endure many laws and government regulations (Mahadea & Pillay, 2008).

International evidence according to Mahadea and Pillay (2008) suggests that the regulatory environment can become a major obstacle to the survival and growth of small and new businesses. They further state that in Africa, entrepreneurs are faced with bigger regulatory obstacles when compared to other regions. Doing business in Africa is costly due to the oppressive laws and regulations that make it difficulties to secure property rights for instance, furthermore the ineffective courts and weak institutions create a challenge (Mahadea & Pillay, 2008).

The benefits of a less regulated environment are attractive; however in Sub-Saharan Africa countries the business reform intensity is still very low when compared to other countries (World Bank, 2006). According to the World Bank, regulatory reforms could add as much as 1.4 percent to average annual gross domestic products (GDP) growth in developing countries (Orford, *et al.*, 2004).

Unwarranted bureaucracy and compliance costs might cause a damaging behaviour by the firms which might damage the overall South Africa's social and economic prospects (Small Business Project, 2005). The South Africa's regulatory environment is still more favourable when compares to that of other developing countries, however there is a possibility to further simplify the regulations and procedures. These simplifications in regulations will help small businesses to thrive in a difficult environment where they have to compete with established businesses.

#### **2.4.2 Micro Environmental Constraints**

The microenvironment is the environment that the organisation has control over and the environment it can influence. Although it might not be possible for organisations to correct all the faults in the microenvironment, but they have a better change of controlling the microenvironment as compared to the macro environment (Schiller, 2009).

Schiller (2009) states that the microenvironment consists of seven larger parts which are:

##### **2.4.2.1 Employees**

Organisations require the right people for each job that they have. This means that they have to find the right skilled people who specialize in those jobs including generally trained workers. However, organisations have a money supply constraint, meaning that it becomes difficult for them to get the skills that they want and this is compounded by the shortage of engineering skills specifically in the market which increases the demand of these skills making them expensive especially for the SMMEs in the engineering sector.

#### **2.4.2.2 Owners and the Board**

The primary goal of the owners and more specially the boards of directors or executive is to maximize the returns for the owners or investors (Schiller, 2009). The executives of the organisation have to make important decisions about reinvesting the profit or keeping it. This depends on the requirements, performance and market position; however it is important for companies in the engineering sector to continuously invest in new technologies which ensures that they remain relevant and competitive as the technology in engineering continuously changes and organisations that do not reinvent themselves tend to remain behind.

#### **2.4.2.3 Consumers**

The key for organisation that remain in business and profitable is loyal customers. There is a lot of competition from organisations to capture the limited customers in the market and for organisation to do this they need to ensure that they provide value to their customers. Value is provided by offering what customers want, being flexible to customer demands and providing quality that is better than that of the competition (Schiller, 2009). The value is created through strategies that ensure that the organisation has flexible production processes that provide high quality products at lower cost than the competition. It is only then that organisations can start competing for the customers available in its market.

Keeping customers is even more crucial for SMMEs to ensure that they generate consistent revenue in the early years; furthermore as they grow they need to ensure that they keep these customers and get new ones to grow their revenue.

#### **2.4.2.4 Contractors**

Contractors are an important part of any organisations as they form an integral part of the supply chain of that organisation. For the organisation to be able to meet its customers demand it requires a strong supply chain to help it meet its mandate. Organisation need to ensure that they choose contractors that will be able to support them, contractors that share the same vision and who understand the goals of the organisation.

#### **2.4.2.5 Competition**

In today's market environment competition is intensifying as more businesses are competing for fewer customers. For organisation to win against their competition they need to develop a competitive edge against their competition. The competitive edge is developed through having or doing things better than the competition in a way that provides value for the customers. The competitive edge is developed through strategies which including production strategies that provide an organisation with improve productivity, reduce waste and improved quality.

#### **2.4.2.6 Financial Organisation**

The effect that financial institutions have in organisations is probably the most visible. For example, the exchange rate difference between two banks could mean millions of extra loss or profit. Their guarantee may be needed for large projects, but beside that they ensure the functionality of SMMEs day to day.

#### **2.4.2.7 The Government**

The Governments might have a direct or indirect effect to organisation depending on the size, location and the market the organisation performs under. Governments subsidize organisations, creates and pass laws and regulations that might impact negatively or positive to the organisations well being.

### **2.5 Production Strategies**

The name of the game in business today is competition (De Villiers, et al., 2008). They further state that those who understand the rules of the game will prosper and those who do not will perish. These rules are set around competing on better quality, higher productivity, faster response to changing market requirements and doing all this at reduced cost (De Villiers, et. al., 2008). In order for businesses to achieve this De Villiers, et al. (2008) suggests that businesses need to develop or adopt sound strategies in order for them to be positioned competitively.

The next section looks at a number of manufacturing strategies that big organisations employ to improve their manufacturing flexibility which in turn provide them with agile response times that places them in a competitive position. These strategies are

discussed with a view to understand if these strategies are suitable solutions for SMMEs to employ with an objective of eliminating some of their internal constraints. The strategies discussed in this study are lean manufacturing, balanced score card, six sigma, layout, just in time (JIT) and total productive maintenance (TPM).

### **2.5.1 Lean Manufacturing**

The definition of lean manufacturing developed by the National Institute of Standards and Technology Manufacturing Extension Partnership's Lean Network states that lean manufacturing is a methodical approach of designed to identify and eliminate waste through continuous improvement and provide a flow of products at the pull of the customer in pursuit of perfection (Vendan & Sakthidhasan 2010).

Vendan and Sakthidhasan (2010) describe lean manufacturing fundamentals as the methodical eradication of waste from all aspects of an organisation's operation. They state further that during the creation of a product or service that a customer wants at a specific time, any resources used that does not lead directly to creating the product is considered as waste. The activities that are considered non value adding can contribute to more than 90 percent of a factory's total activities in many industrial processes (Vendan & Sakthidhasan 2010).

Panizzolo (1998, cited in Vendan & Sakthidhasan, 2010) states that lean operating principles were first used in the manufacturing environment and are known by a variety of names; Lean Manufacturing, Lean Production, Toyota Production System, etc. They state that the common belief about lean manufacturing is that it started in Japan by Toyota; however there is evidence that Henry Ford had already started using some parts of lean in the early 1920's.

The following quote provides evidence that Henry Ford was using Lean manufacturing, "One of the most noteworthy accomplishments in keeping the price of Ford products low is the gradual shortening of the production cycles. The longer an article is in the process of manufacturing and the more it is moved about, the greater is its ultimate cost" (Vendan & Sakthidhasan, 2010).

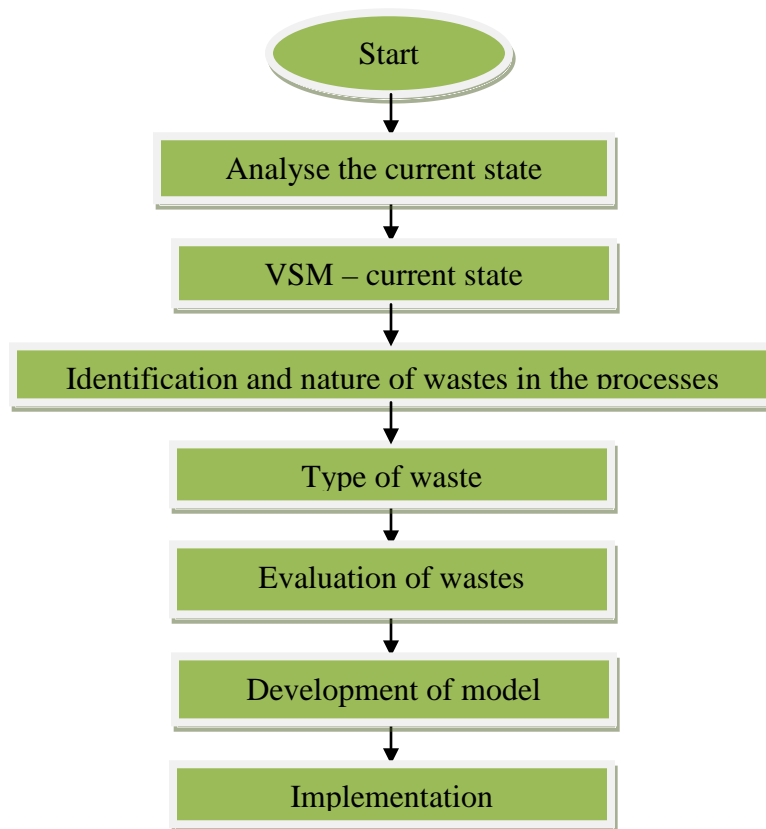
Lean manufacturing according to Vendan and Sakthidhasan (2010) comes across as a tool that has great potential of addressing a variety of concurrent challenges including high levels of process and product quality, low cost and reduction in lead times. For organisations to be able to benefit from lean methodology they need to implement it properly.

According to Vendan and Sakthidhasan (2010) the implementation of lean methodology should be done only under the solid championship of top management, with the understanding that a lot of processes must be changed. The implementation of lean manufacturing should follow the following step by step process (Vendan and Sakthidhasan 2010).

- Conduct extensive education
  - Education on Lean manufacturing should be conducted to ensure that everyone in the organisation understands the new direction that the organisation is embarking upon and to prepare them for the changes that will be happening in their jobs and the processes that they are responsible for in the organisation.
- Value stream map administrative, engineering and production processes
  - Value stream mapping (VSM) is a set of methods to visually display the flow of materials and information in the production process from beginning to end; it is about the categorization of the value added activities from the non value added activities.

Using value stream mapping the current state of the process is mapped first to discover the sources of waste and identify lean tools to eliminate this waste. Once this is complete the future map is developed for a system that incorporates Lean tools. The benefits gained from using Lean tools and techniques are identified in the value stream mapping by developing a detailed simulation model and a design experiment is used to analyse the outputs of the simulation model for different lean configurations.

Figure 2 shows the various steps in implementing value stream mapping.



## 2. 2: VSM Methodology

Source: Adapted from Vendan and Sakthidhasan, 2010:582. Reduction of wastages in motor manufacturing industry. *Jordan Journal of Mechanical and Industrial Engineering*, 4(5), pp. 579 – 590.

From the literature above it can be deduced that VSM is a perfect tool to identify the sources of waste within a process and to put together and implement improvements. The benefits and effectiveness of lean manufacturing are substantiated, and these benefits are the reduction in levels of processes, improvement in product quality, provides a platform for low cost productivity and reduction in lead times. These benefits are what give a business a competitive edge to be better than its competitors and be able to provide its customers the flexibility that they require. It is these types of benefits that SMMEs require to compete in markets like the engineering sector where there are

established businesses that keep reinventing themselves. With these benefits SMMEs can afford to invest the savings from their production processes in reinventing and acquiring new technologies.

### **2.5.2 Balanced Score Card**

The balanced scorecard (BSC) as an analytical framework translates the vision of the business and high level business strategies into specific and quantifiable goals (Gouws, Hablezion, Vermaak & Wolmarans, 2006). The balanced scorecard methodology according to Gouws, et al. (2012) breaks high level strategies into objectives, targets, measures and initiatives and put in place measurement tools to monitor performance against those goals. The balance scorecard is a result of a research by Robert Kaplan and David Norton done in the early 1990's (Gouws, et al., 2012). Their research revealed that successful companies did not only rely on financial measurement for the evaluation of their performance; however they also evaluate the performance from the customer, internal processes and learning and growth perspective (Gouws, et al., 2012).

To better control the organisational structure and operational process in an integrated way, Tsang, et al. (2011) suggests that an element by element strategy management tool which is capable of monitoring the overall strategy implementation is required. Under this condition Tsang, et al. (2011) suggests further that the balanced scorecard is a suitable and appropriate tool. The BSC was a method implemented originally in the large organisations which have more complex structures of businesses (Tsang, et al., 2011). However, Tsang, et al. (2011) state that because the strategic component of controlling system are not that much developed in SMMEs than in larger enterprises the effectiveness of BCS to operate in SMMEs should not be ignored.

The BSC can deal with the problem of limited management structures and financial resources; it can also help with the relative weakness of the strategic component in SMMEs (Tsang, et al., 2011). However, Tsang, et al. (2011) state that for BSC to be effective in SMMEs, the following elements are required:

- A clear sense of direction on long term strategic goals



- A thorough understanding of the business model
- An ability to focus and prioritise initiatives
- The ability for the organisation to change

According to a study done on SMMEs using BSC by Fernandes, et al. (2006 cited in Tsang, et al., 2011), the following benefits were identified:

- BSC implementation in SMMEs improves their capability to respond quickly to the ever changing market
- It enhances the company's stability and operability
- It helps keep the inventory levels low
- The stock turnover of products in the warehouse is lowered significantly
- The flow of information in the supply chain is significantly improved
- The relationship between the upstream enterprises and downstream enterprises is standardized through the implementation of the BSC
- The influence of the company's products and popularity of the company is increased

The above discussion and benefits of the BSC proves that it is not a system for large organisations but also for SMMEs to implement. The selection of the BSC as the strategic management tool appears to be an appropriate decision. However it should be noted that the BSC requires that management continuously monitors the progress and that the BSC bring to bear the necessary changes in the organisation for it to be deemed successful.

### **2.5.3 Six Sigma**

Six Sigma according to Brue (2002) measures a process in terms of defects at the six sigma level, and the measurement is done through a statistical process. He further state that Six Sigma only allows processes to deliver 3.4 million defects per million. Six Sigma is a management way of life that focuses on the elimination of defects through practices that emphasizes understanding, measuring and improving processes (Brue, 2002).

The Six Sigma management approach according to Brue (2002) is about helping organisations identify what they do not know, what they should know so that they can take actions to reduce the errors and rework that cost time, money, opportunities and customers. Zailani and Sasthriyar (2011) declare Six Sigma as an influential business strategy used to improve; it also enables companies to utilize simple and powerful statistical methods to identify measurements, evaluate progress and control processes in order to achieve and sustain operational excellence.

Previous studies have shown that failure to provide proper infrastructure for implementation results in 80% of all TQM implementation failures (Zailani & Sasthriyar, 2011). It also needs to be understood that Six Sigma will make improvements and changes to some full time jobs of a small but critical percentage of the organisation's personnel (Zailani & Sasthriyar, 2011). The fundamental idea behind the Six Sigma philosophy according to Hoerl (1998 cited on Zailani & Sasthriyar 2011) is to constantly reduce disparities in processes and aim at eliminating defects or failure from every product, service and transactional process. According to Antony and Banueles (2001 cited on Zailani & Sasthriyar 2011) Six Sigma can be defined in business terms as a business improvement strategy used to drive out waste, reduce quality costs, improve effectiveness and efficiency and most importantly improve profitability.

They further define it in statistical terms as a term that refers to 3.4 defects per million opportunities. There are essential factors that determine the Six Sigma process success and it is important for organisations to understand these critical success factors as they are the key to the successful Six Sigma implementation (Zailani & Sasthriyar 2011).

According to Zailani and Sasthriyar (2011), these critical factors include but not limited to the involvement of management which is critical to keep the energy of the initiative high. The change of organisational culture is also important as Herderson and Evens (2000 cited on Zailani & Sasthriyar 2011) stated that Six Sigma needs the right mind set and attitude from people working within the organisation.

Six Sigma according to Ndala (2004) is very relevant to SMMEs. The prime example of this according to Ndala (2004) is the work that The South African Quality Institute (SAQI) is doing with SMMEs in terms of uplifting their quality standards. The SAQI has set up a Quality Infrastructure Development Programme (QIDP) for SMMEs which is designed to help SMMEs get their Six Sigma certifications. In the SAQI 2004 annual the chairman mentioned the implementation of QIPD as one of the successes in helping SMMEs achieve Six Sigma and helping them meet quality standards which he stated as key to the development of the country's economic growth (Ndala, 2004)

Six Sigma like most total quality management (TQM) implementations require a solid organisational infrastructure, management commitment is said to be the number one critical success factor as lack of senior management commitment results in the weakened Six Sigma initiative. Cultural change is required if Six Sigma is to be successfully implemented, and that change involve training of individuals who will lead and participate in Six Sigma projects. Finally Six Sigma has been proven to bring results to SMMEs.

#### **2.5.4 Layout**

Lean manufacturing concepts uses the pull production philosophy where the demand from downstream drives the flow on the production floor by pulling production upstream unlike the traditional batch based production where production is pushed from upstream to downstream based on a production schedule (Pattanaik & Sharma, 2009). They further state that some of the features of lean manufacturing include a one unit at a time production, elimination of non value added time, production in the work content time only and balancing of all processes to produce at the same Takt rate. According to Pattanaik and Sharma (2009) Takt time is the rate at which work progresses through the shop floor.

The flow of the product through the shop floor is achieved through causing all of its work tasks to be grouped and balanced to a calculated Takt time. Cellular manufacturing according to Pattanaik and Sharma (2009) is an application of group technology, it is a manufacturing philosophy where parts in a manufacturing plant are group into families

of parts and machines are allocated into machine cells. They state that the reduction of setup time, reduced work in process inventory, shorter throughput time, reduced material handling costs and better quality are amongst some of the many benefits of cellular manufacturing.

Cellular manufacturing has the ability to help eliminate many non-value added activities from the production process like waiting times, bottleneck, transport and work in progress and hence it helps to achieve the objectives of lean manufacturing (Pattanaik & Sharma, 2009). A US manufacture of upholstered furniture reported a 36% increase in labour productivity as a result of implementing a cellular manufacturing layout (Pattanaik & Sharma, 2009). It is also important to note, according to Pattanaik and Sharma (2009) that for the cellular manufacturing to be effective, lean manufacturing concepts should be implemented within the cellular layout. This means that the cellular layout should follow the lean principles when being implemented.

When the cellular layout is implemented, the first step is to analyse the original cell with a view of minimizing wastages such as waiting time, slack time and other non value added activities (Pattanaik & Sharma, 2009). To achieve this parts are grouped into families and machines combined into cells. The benefits of lean layout designs are evident from the production output, improve labour productivity and better flow of parts in the production process (Pattanaik & Sharma, 2009).

### **2.5.5 Just In Time (JIT)**

The primary goal of Just in time (JIT) as a manufacturing system is to continuously reduce and ultimately eliminate all forms of waste (Jirarat, et al., 2011). They further state that the focus of JIT is on minimizing raw materials, work in progress, and finished goods inventory, the vision being the cutting of inventory costs and exposing other more serious inefficiencies in the manufacturing sequence.

According to Cai-feng (2009) JIT production system speaks to an operation and production system where materials are moved effortlessly through the production system and where services are delivered with defined timing to ensure that they are distributed as required every step of the process. Furthermore JIT is a production

system that encompasses all aspects of the process from organisational management, production scheduling, flexible workers, and scale of production, inventory, material handling, transportation, high quality and supplier relationship. Whilst at the same time it is a system that is responsive to disruptions and is flexible to product variety and range as well as the process.

JIT manufacturing according to Agrawal (2010) is associated with the principles of pull production control. He further state that the pull system unlike the release system is controlled by downstream information and is naturally make to stock because stock voids in the pull system trigger a release. The objectives of a pull system according to Agrawal (2010) are the production of the right parts in the right place at the right time. Elimination of waste caused by any activity that increases cost without adding value, such as movements of materials unnecessary, excess inventory and rework of parts. Pull systems help with improving profits and return on investments, which is achieved through reducing inventory levels, increasing the inventory turnover rate and improving quality of products.

Furthermore, pull systems require the implementation of quality programs, implementation of supplier quality assurance and to provide worker education that ensures that workers understand their responsibility like stopping production when something is not correct in the process; point out line slowdowns or stoppages and to record all production issues. The introduction of quick setups through better planning, process and product redesigning to accommodate economical production of smaller lots is also crucial for pull systems.

The JIT manufacturing system is about the reduction of inventory levels, improve product quality, raise process flexibility, reduce lead times, increase productivity and equipment utilization, reduce scrap and rework and reduce space requirements (Cai-feng, 2009). With all these benefits, Cai-feng (2009) warns that if enterprises fail to implement JIT successfully it could lead to extra personnel and higher inventory stockpiles and loose of customers. For enterprises to acquire these benefit Cai-feng (2009) states that JIT requires highly capable production systems, capable and

responsible workers. If this is in place then enterprises will be able to produce small lot sizes at reduces cycle times and provide their customers with the flexibility they require.

Lourens and Jonker (2012) established in their research that technologies like JIT were regarded by their respondents as key elements to achieving competitive edge. Their respondents were from the SMME community thus confirming that JIT is a relevant strategy for SMMEs to reduce inventory levels, improve product quality and reduce waste.

### **2.5.6 Total Productive Maintenance (TPM)**

Total productive Maintenance (TPM) is a team based preventative and productive maintenance programme that was first developed in Japan, TPM involves all levels and all functions in the organisation, from top executives to the production floor operators (Sun, et al., 2003). It is further defined by Brar (2006) as a system for maintaining and improving the integrity of the production system through the machines, equipment, processes and employees that add value. Moreover, TPM has been proven as a successful system to increase productivity and overall equipment effectiveness (Sun, et al., 2003). The essence of TPM is zero stoppages and zero breakdowns; this is achieved according to Gajdzik (2009) because TPM teaches machine operators and other workers how to look after the company's equipment.

Because of TPM all equipment in the production line are always ready to perform their task and the result is that no disruptions take place in the production process (Gajdzik, 2009). The concept of TPM is based on three major concepts, maximizing equipment effectiveness, autonomous maintenance and small group activities (Brar, 2006). Due to this concept Brar (2006) explains that a new definition was introduced by the Japan Institute of Productive Maintenance in 1989. The definition states that the strategy of TPM is to develop a corporate constitution that maximises the effectiveness of production system by using a shop floor approach, build a zero loss organisation with zero accidents, zero defects and zero failures through the life of the production system, build a system that involves all departments in the implementation of TPM and to also conduct zero loss activities through overlapping small group activities (Brar, 2006).

The implementation of TPM should start with the visible commitment of upper level management, thereafter the entire workforce needs to be educated about the concepts of TPM and this should most be done by a dedicated and experienced TPM coordinator (Brar, 2006). When everyone understands the concepts of TPM then teams that include operators, maintenance personnel, schedulers and upper management can be formed (Brar, 2006). The objective of the teams according to Brar (2006) is to pinpoint problem areas, detail a course of corrective action and initiating corrective processes. All successes from the teams should be publicly recognized to promote the benefits of TPM and make the programme a success (Brar, 2006).

“TPM is concerned with the fundamental rethinking of business processes to achieve improvements in cost, quality and speed” (Brar, 2006). Companies that have successfully implemented TPM show the following benefits according to Gajdzik (2009); growth of employees with new skills being learnt, increased work efficiency, reduction in breakdowns, reduction in the number of accidents, reduction of waste, improved quality and reduction of customer complaints. TPM helps give organisation a permanent competitive advantage (Gajdzik, 2009).

## **2.6 Summary**

SMMEs are an important source of job creation; they contribute extensively to economic growth of most countries and to their national and individual prosperity (Mahadea & Pillay, 2008). They are able to solve the persistent problem of unemployment while being highly efficient in activating domestic competition by creating market niches (Kesper, 2001). Furthermore Kesper (2001) stated that SMMEs in the manufacturing sector in South African are an important element of economic activity and employment growth. However, the importance of SMMEs is eroded by their failure to generate jobs and reach their full potential. The failure by most SMMEs is mostly attributed to the constraints that they face daily in their business transactions.

The constraints that SMMEs have to contend with on a daily basis come from both the micro and macro environments that SMMEs operate within. According to Clover and Darroch (2005), socioeconomic and institutional factors such as macroeconomics

policies and personal characteristics of the entrepreneur can directly affect the enterprise success and economic development. SMMEs are likely to encounter constraints on all business operations functional areas, and the areas are management, marketing, operations and finance (Clover & Darroch, 2005).

Taking into consideration the importance of SMMEs and the constraints that they encounter, it should however be noted that business is about creating value and profit. According to Gajdzik (2009) competitive advantage is achieved through low costs, high efficiency and customer oriented operations. The hypothesis of this study is that these factors of competitiveness can be achieved through the use and proper implementation of production strategies. The production strategies investigated in the study are lean manufacturing, balanced score card, six sigma, layout, JIT and TPM.

The benefits and effectiveness of production strategies according to the strategies reviewed in this study can be summarized to be the reduction in levels of processes, improvement in product quality, improved labour productivity, and better flow of parts in the production processes, reduction in the number of accidents, reduction of waste, and reduction of customer complaints. Furthermore the review of these strategies revealed that they are very relevant to SMMEs as much as they are to big businesses. It is also shown in the literature review that the understanding and proper implementation of production strategies is the key to achieving competitive advantage. It is this advantage that SMMEs require to overcome the constraints they face and improve their chances of prospering, creating jobs and contribute to economic growth.

However it should be noted that all production strategies require management involvement, training, culture change and infrastructure improvements otherwise they will not be successful. Failure to implement production strategies successfully could lead to extra personnel and higher inventory stockpiles and loose of customers.

The next chapter, Chapter Three covers the research methodology that was utilized in the study to collect and analyse data from the field so that reality can be contrasted to the theory reviewed in this chapter.



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The collection of data from SMME's is a process that requires one to approach it with care as most SMME owners are sceptical to these types of surveys and in most instances they feel that they are being interrogated. The research employed in this study was designed around a methodology that ensured that SMME's understand the objective of the study whilst keeping the study simple and effective to ensure that a good response rate was attainable. The study made use of a cross sectional survey to assess the production strategy employed by Small, Medium and Micro Engineering Enterprises in the Jacobs Area.

#### **3.2 Aim and Objectives of the Study**

The aim of this study was to identify whether or not SMME's in the engineering sector are using well researched and widely used production strategies in their operations, and moreover to identify what value they receive from utilising such production strategies. In addition this research considered the use of such production strategies and if they added value which is translated to their customers and if such adds to their profitability.

The following objectives were addressed by the study:

- To identify what production strategies are employed by SMMEs.
- To identify and evaluate challenges experienced by SMMEs in implementing production strategies.
- To review and evaluate the effectiveness of production strategies in the SMMEs operations.
- To determine the overall benefits that production strategies provide to SMMEs in the engineering sector in the Jacobs area.
- To determine the risks related with not having production strategies in place.

### **3.3 Participants and Location of the Study**

The population focus of this study was SMME's in the engineering sector in the Jacobs area in Durban. The participants that were involved in the study were managers from the SMME engineering population. The reason for choosing managers as respondents was due to the fact that the study was designed to research strategic issues that managers should be accountable for in organisations. The focus of the questionnaire designed was around strategic issues that managers are involved with on a daily basis and on issues that shape or should shape the future growth of their businesses.

### **3.4 Research Design**

Sekaran and Bougie (2010) state that once the variables in a problem situation are identified and the theoretical framework has been developed, the following step is to design the research in an approach that required data can be collected and analysed to arrive at a conclusion. The other important aspect of any type of research study is data collection; inaccurate data collection impacts the results of a study and ultimately leads to invalid results. According to Sekaran and Bougie (2010) there are two methods of data collection for research purposes, i.e. Quantitative and Qualitative methods. The quantitative method is objective, the outcome is often known and one uses survey questionnaires (Sekaran & Bougie, 2010). Qualitative research is based on subjective responses, outcomes are not always clear and this methodology is based on the interviews. The following sections will briefly deliberate on quantitative and qualitative methodologies, thereafter the methodology used for this study and the rationale are discussed.

#### **3.4.1 Quantitative Research**

Mclafferty, Slate and Onwuegbuzie (2010) state that quantitative research methods are intended to yield accurate, concise, replicable and generalizable findings, which are optimal to the study of mechanical aspects of human experience. Meadows (2003) further states that quantitative research has been considered as the epitome of scientific research due to its focus on hypothesis testing, reliability and validity, enumeration and statistical inference. Quantitative research according to Meadows (2003) involves the use of experiments such as random control trials and surveys; data is collected in

quantitative research through the use of standard methods such as questionnaires and structured interviews. The data collected through quantitative research according to Meadows (2003) is pre-specified in terms of what is going to be done and that approach is deductive and not inductive. In a deductive approach data is collected for the purpose of testing ideas and hypothesis, whilst an inductive approach uses data collected to form ideas and generalization.

#### **3.4.1.1 Types of Quantitative Research**

According to Meadows (2003) there are two types of quantitative research strategies; the experimental and non-experimental designs.

- Experimental Designs
  - The experimental strategies are characterized by the manipulation of or the introductions of some variables such as treatment of data, and then the outcomes from the treated data are compared to outcomes of a controlled group that has not received treatment.
- Non – Experimental Designs
  - In non-experimental designs data is collected from existing groups like comparing variables between scales, gender or age which is known as a relational design, or to identify within a specific group types and frequency of income which is known as a descriptive design, and finally there is an analytical design which determines for example why a particular group will be affected by recession while another group is not affected.

#### **3.4.1.2 Advantages of Quantitative Research**

- It can be presented in both graphical and tabular form.
- The data collected is representative of a larger group.
- It allows researchers to compare data between different groups.
- It is considered as the epitome of scientific research due to its focus on statistical inference.
- It can be used in descriptive design to collect data within a specific group.
- The data can be manipulated by introducing variable and compared to non manipulated data.

### **3.4.1.3 Disadvantages of Quantitative Research**

- The statistical significance is not related to the size or the importance of the effect being analysed.
- Participants in the survey may not be genuine when answering the questionnaire compared to face to face interviews.

### **3.4.2 Qualitative Research**

Mintzberg (1979, cited in Shah and Corley, 2006), states that researchers generate theory and not data. He further states that empirical patterns observed are described through the use of data, whereas theory clarifies why empirical patterns are observed and this he stated that requires rich knowledge that only qualitative methods can offer.

Shuval, Harker, Roudsari, Groce, Mills, Siddiqi and Shachak (2011) define qualitative research as a form of empirical inquiry that usually entails elements of sampling that is usually purposeful and concentrating on information rich cases. Data collection is done through in-depth and open ended interviews, also through participants and field observations, documents and artifact studies. Qualitative research uses ideas, thoughts, concepts and phrases as the unit of analysis and not numbers as in quantitative research. Sekaran and Bougie (2010) state that some qualitative studies are exploratory in nature, their data reveals certain patterns regarding the observable fact of interest, it leads to development and formulation of hypothesis and the subsequent testing of that hypothesis.

The primary benefits of qualitative research according to Shah and Corley (2006) are that they let the researcher to discover new variables and relationships. Furthermore it permits the researcher to reveal and understand complex processes through the use of qualitative methods; also the researcher is able to illustrate the social context from the data. Moreover Shah and Corley (2006) state that qualitative researchers tend to describe their data and analysis in detail owing to the use of multiple modes of data collection. The downside of qualitative research according to Shah and Corley (2006) is that new ideas derived from qualitative enquiry are unsystematic resulting in poor peer reviews processes.

### **3.4.3 Research Methodology Used for this Study**

The research methodology used for this study was in essence quantitative. The initial forecast was that both quantitative and qualitative methodologies were going to be utilised for the study, with the qualitative component used for interviews of the SMME owners and managers. However due to the schedules of the SMME owners and managers this attempt was unsuccessful, furthermore the time constraint of the study dictated that this component be cancelled.

The qualitative research methodology was used for this study due to the advantages that it yields accurate, concise and replicable results. Furthermore due to the limited respondents to the study a methodology that was representative of a larger group was crucial so that the results could be representative of the larger SMME community in the Jacobs area.

### **3.5 Sampling**

A sample is the selection of a subgroup from a larger group. The sample is derived from the larger group referred to as the population. A sample is taken in order to draw conclusions about the sample and generalise it back to the population (Sekaran and Bougie, 2010). They state further that there are two types of sampling techniques, probability and non-probability sampling.

#### **3.5.1 Probability Sampling**

Meadows (2003), states that in probability sampling every sampling unit within a target population has an equal chance of being selected. They further state that the underlying principle of probability sampling is removing subjectivity when choosing a sample by doing random selection. Moreover, Meadows (2003) affirms that if the selection is prepared correctly it provides the researcher with the confidence that the sample is representative of the target population and that the survey findings can be extrapolated with a certain degree of confidence to the target population.

### **3.5.1.1 Simple Random Sampling**

The selection in simple random sampling is made by chance alone, for example by drawing numbers from a hat, each number in the hat has an equal chance of being selected.

### **3.5.1.2 Stratified Random Sampling**

In stratified sampling a random sample is selected from a subgroup. The target population is divided to subgroups of age, gender and treatment type for instance, and that is where the sample is selected from. Stratified sampling is time consuming and costly, however it is a good reflection of the target population and it reduces sampling variations.

### **3.5.1.3 Systematic Sampling**

Systematic sampling is convenient, however it is not suitable for target populations with recurring targets, for example names starting the same letter or similar dates of birth.

### **3.5.1.4 Cluster Sampling**

This sampling method uses already existing groups like doctors, schools and hospitals with large sampling units and available list to select the target units. It is due to this reason that cluster sampling is considered to be a convenient method to select the sample targets. Sekaran and Bougie (2010), state that a specific type of cluster sampling is area sampling where a sample is done according to a geographical area. This sampling method was used for this study due to the fact that the target group already existed and known.

### **3.5.2 Non Probability Sampling**

Meadows (2003), states that the samples in non-probability sampling are not chosen to be representative of the target population, however samples which represent the characteristics of the target population are chosen. Meadows (2003), states further that this creates a predicament where the results of the study can either be deemed to represent the target population or they can be deemed not representing the target population. Non-probability sampling according to Meadows (2003) is most commonly used in flexible or qualitative research designs, where the emphasis is on selecting the

samples purposively. The samples are selected to represent wide spectrum of views and experiences, moreover to cover a full range of individual views so that the variations in the nature of their views and experiences can be identified, explored and explained (Meadows, 2003). The following non-probability sampling methods according to Meadows (2003) are used:

#### **3.5.2.1 Convenience Sampling**

Individuals in the method are selected because they are available and willing to participate; it is also known as haphazard or accidental sampling.

#### **3.5.2.2. Purposive Sampling**

This type of sampling is commonly used for qualitative methodology. Individuals are selected based on the researchers need or purpose. Some of the variations of purposive sampling are snowball, expert and heterogeneity sampling.

#### **3.5.3 Population and Sampling Used in this Study**

The research was conducted on existing small medium and micro enterprise in the Jacobs area in Durban. The geographical area was selected because of the number of SMME in the area. There are 1363 registered engineering businesses in Durban and in the Jacobs area there are 129 registered engineering SMMEs. Furthermore, based on the inside acquaintances and understanding of the area, including access to potential respondents, it was logical to target the area and the people concerned.

A probability sampling method was used for this study because the elements in the population that were selected had an equal chance that the rest of the elements in the population. The type of probability sampling used was cluster or area sampling because it was less expensive and also because the target area was known.

#### **3.6 Data Collection**

Based on the quantitative nature of this study and the limited information on production strategies used by SMMEs, data was collected from primary sources. A questionnaire was used to collect the data for analysis. According to Sekaran (2003 cited on Zailani and Sasthriyar 2011), a questionnaire is a formulated written set of questions to which

respondents record their answers, usually within rather closely defined alternatives. The questionnaire was used to collect primary data from respondents using closed questions. The respondents were provided with the questionnaires and the purpose of the research was explained to them.

The respondents were approached by means of e-mails and asked to complete the questionnaire. A structured questionnaire was used to obtain data in the quantitative format. Questionnaires were pre-tested to determine face validity and to establish whether questions were clear and that they were neither double barrelled nor leading. They were pre-coded to aid with input and analysis of data for the final report.

### **3.7 Development of the Instrument**

The research instrument used in this study was a questionnaire. The questions were derived from the literature review, based on the objectives of the study. The questionnaire used a Likert scale to measure the response of the respondents. Sekaran and Bougie (2010) state that the Likert scale is designed to scrutinize how the subjects to a research agree or disagree with a statement on a five point scale. Using the Likert scale the responses over a number of items focusing on a particular concept or variable can be analysed item by item, furthermore it is possible to calculate a summated score for each respondent by summing across items (Sekaran & Bougie, 2010).

The questionnaires in this study were personally administered, meaning that the questionnaires were given to the respondents and collected from them at a later date. A covering letter was also attached to the questionnaire; this was to ensure that the respondents were informed of the nature and purpose of the research. The questions in the questionnaire included multiple-choice questions. The questionnaire was designed in English, as it was believed that most of the respondents understand English.

### **3.8 Pretesting and Validation**

Sekaran and Bougie (2010) state that in order to ascertain that the respondents will understand the questions and there are no ambiguities, it is important to pre-test the questionnaire or instrument used for the research. In this study the pretesting was done with a small group of fellow students and also it was validated by the supervisor of this



study to ensure that it was understandable. Furthermore, in order to ascertain that all the respondents completely understood all the questions, the respondents were thoroughly informed of the purpose of the research and how they should approach answering the questionnaire.

### **3.9 Analysis of the Data**

The data analysis software used in this study was the SPSS software. According to Sekaran and Bougie (2010) SPSS (statistical package for the social science) is a data management analysis programme designed for statistical analysis, plots, frequencies, charts, lists and sophisticated inferential and multivariate statistical procedures. The test used in this study is the Regression and Correlation Analysis which tests the strength and correlation of the relationship between two variables. This test is used to test the correlation between SMME growth and the use of production strategies.

### **3.10 Summary**

The collection of data from SMMEs is a process that requires one to approach it with care especially when dealing with SMME owners who are sceptical to these types of surveys and in most instances they feel that they are being interrogated. This chapter covered the objectives of the study, the location where the study was conducted, the types of research methodologies and the sampling method used in the study. The study is a quantitative type study, the probability type sampling method was used and the area sampling method being the specific type used. Furthermore the data collection process is discussed along with the research instruments employed in the study. Finally the method and tests that are used to analyse the data are discussed. Chapter four focuses on the results of the data analysis conducted.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION OF RESULTS**

#### **4.1 Introduction**

This chapter discusses the results from the questionnaires; the results are presented in tables for easy reading. Due to the amount of analysis done for the study this chapter only concentrates on presenting the core findings from the questionnaires the rest of the statistical analysis is presented in appendices, meaning that data is only presented in tables in this chapter. The results presented show the questions that were asked and then provide an outline of the distribution of responses from the respondents and those are discussed briefly under each question presentation. The reliability of the results are discussed, which helps to determine the validity level of the questionnaire.

#### **4.2 Analysis Method Defined**

The data analysis in this study was done using the Statistical Package for Social Science (SPSS) Version 18 for Windows. The statistical package was used for the goal of being able to present the data in both the descriptive and inferential statistical form. The complete statistical results from the data analysis are presented in the appendices. The research methodology adopted for this study required that 30 questionnaires be completed. This was to meet the requirements of being statistically capable in order that the recommendations may be generalised (Sekaran, 2006).

A total of 32 questionnaires were received, two more than the 30 that were required, the extra questionnaires were also considered for the data analysis. The response rate that is rather high can be attributed to the constant follow up undertaken on questionnaires to the respondents and the extra questionnaires were due to two extra questionnaires being issued after the initial respondents were not responding only for them to respond later.

Results in this chapter are presented in accordance with the design and format of the questionnaire. This study was based on five objectives that it was designed to research; hence the questions in the questionnaire were designed to elicit answers to these

objectives. The questionnaire is divided into five parts with each part linked to an objective, question one is linked to objective one which is about identifying what production strategies SMMEs employ in their operations. Part two involves question two to five which are linked to the objective that seeks to identify and evaluate challenges experienced by SMMEs in implementing production strategies and that is objective two.

The third objective is about reviewing and evaluating the effectiveness of production strategies in SMME operations and that objective is linked to question six to nine which completes part three. Part four discusses question ten to twelve linked to objective four, which is about evaluating the overall benefits of production strategies. The last part discusses question thirteen to seventeen and they are linked to objective five which is about determining the risks related with not having production strategies in place. All the results are presented in tabular form for easy of reading and understanding.

### **4.3 Assessment of the Research Process and Questionnaire**

The research process and the questionnaire were validated in order to remove any bias in the process and also to ensure that the results of the study are valid and they can be trusted.

#### **4.3.1 Questionnaire Reliability & Validity Results**

The questions in the questionnaires were drawn from the review of the literature, conceptual framework, existing valid and reliable scales. In this study Cronbach's Alpha is used to measure the issue of reliability in order to understand whether the questions in the questionnaire all reliably measure the same underlying variable and also to evaluate the internal consistency of production strategies and how they affect the organisation.

Table 4.1 and Table 4.2 below show the data analysis results calculated; the Cronbach's Alpha is 0.701 which is above 0.7, so the scale can be considered reliable. In other words, in the current study the Cronbach's Alpha coefficient, 0.701 shows that the questionnaire was of good quality and reliable to measure all the underlying variables.

**Table 4.1:Case Processing Summary**

	N	%
Valid	28	93.3
Cases Excluded <sup>a</sup>	2	6.7
Total	30	100.0

a. List wise deletion based on all variables in the procedure.

**Table 4.2:Reliability Statistics**

Cronbach's Alpha	N of Items
.701	17

## 4.4 Results and Discussion of Findings

### 4.4.1 Part One

Part one discusses the results of question one which is linked to objective one.

**4.4.1.1 Objective One:** To identify what production strategies are employed by SMMEs.

#### 4.4.1.2 Tabulation between SMMEs and production strategies that they employ

**Table 4.3: Which of the following production strategies do you employ in your operations?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Lean manufacturing	9	28.1	28.1	28.1
Balanced score card	2	6.3	6.3	34.4
Valid Six sigma	6	18.8	18.8	53.1
JIT	9	28.1	28.1	81.3
TPM	6	18.8	18.8	100.0
Total	32	100.0	100.0	

Table 4.3 reveals the distribution of respondents on the production strategies that they employ in their operations. The largest percentages of the respondents according to Table 4.3 stated that they use lean manufacturing and JIT, both of which have a high level of 28.1% apiece. Six sigma at 18.8% was at second place in terms of the distribution of usage, together with TPM at the same percentage of 18.8%. The balanced score card was the least used production strategy according to the respondents at 18.0%.

#### 4.4.2 Part Two

Part two discusses the results of question two to five which is linked to objective two.

**4.4.2.1 Objective Two:** To identify and evaluate challenges experienced by SMMEs in implementing production strategies.

#### 4.4.2.2 Question Two

**Table 4.4: Cost is a negative factor when it comes to implementing production strategies**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	9.4	9.7	9.7
	Disagree	4	12.5	12.9	22.6
	Unsure	2	6.3	6.5	29.0
	Agree	10	31.3	32.3	61.3
	Strongly agree	12	37.5	38.7	100.0
	Total	31	96.9	100.0	
Missing	System	1	3.1		
Total		32	100.0		

Table 4.4 evidently show that the majority of the respondents 68.8% agree that cost is a negative factor when it comes to implementing production strategies 31.3% agree and 37.5% strongly agreed. Some 6.3% of the respondents were unsure if cost was a negative factor and 3.1% did not answer the question. However, 21.9% of the respondents felt that cost was not a negative factor when it comes to implementing production strategies 12.5% disagree and 9.4% strongly agree. Given the technical nature of engineering firms, there can be no doubt that 30% of the respondents did not consider cost to be a major factor simply because of the strong reputation that will have built up for providing solutions for clients' problems.

#### 4.4.2.3 Question Three

**Table 4.5: A lot of resistance to change was experienced when implementing our production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	1	3.1	3.1	3.1
Unsure	7	21.9	21.9	25.0
Agree	21	65.6	65.6	90.6
Strongly agree	3	9.4	9.4	100.0
Total	32	100.0	100.0	

Table 4.5 reveals the evidence that the majority of the respondents 75% did experienced a lot of resistance to change when implementing their production strategies with 65.6% agreeing and 9.4% strongly agreeing. The other respondents 21.9% were unsure and 3.1% of the respondents strongly disagree that they experienced any resistance to change when implementing their production strategies.

#### 4.4.2.4 Question Four

**Table 4.6: Uncertainty of the unknown was a factor that was considered when deciding on the production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	6	18.8	18.8	18.8
Unsure	8	25.0	25.0	43.8
Agree	15	46.9	46.9	90.6
Strongly agree	3	9.4	9.4	100.0
Total	32	100.0	100.0	

It is evident from Table 4.6 that uncertainty of the unknown was a factor taken into consideration by the majority of the respondents (56.3%) when deciding on the production strategy with 46.9% of the respondents agreeing and 9.4% strongly agreeing. The table also reveals that a rather large number of respondents (25.0%) were unsure, whilst 18.8% of the respondents felt that uncertainty was not a factor taken into consideration as they strongly disagreed with the question. To have 18.8% disagree and 25% unsure certainly indicates that almost 20% of respondents proceed with their work without considering the unknown and 25% not even sure about the matter. This is indicative of poor management.

#### 4.4.2.5 Question Five

**Table 4.7: There were disruptions to production whilst implementing the production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	1	3.1	3.1	3.1
Disagree	6	18.8	18.8	21.9
Valid Unsure	7	21.9	21.9	43.8
Agree	15	46.9	46.9	90.6
Strongly agree	3	9.4	9.4	100.0
Total	32	100.0	100.0	

Table 4.7 reveals the distribution of the respondents and shows that 56.3% of the respondents did experience some disruptions to their production while implementing their production strategies with 46.9% of the respondents in agreement and 9.4% strongly agreeing. This is followed by respondents that were unsure at 21.9% and the respondents that disagree at 18.8% and strongly disagree at 3.1%. The 3.1% that strongly disagreed one would surmise are people who run less complex process and, or are more skilled. With regard to the 18.8% who disagreed they too most probably run their processes well and, or have simple production processes.



#### 4.4.3 Part Three

Part three discusses the results of question six up to question nine which is linked to objective three.

**4.4.3.1 Objective Three:** To review and evaluate the effectiveness of production strategies in the SMMEs operations.

#### 4.4.3.2 Question Six

**Table 4.8: Your production strategy provides enhanced performance and productivity**

	Frequency	Percent	Valid Percent	Cumulative Percent
Unsure	1	3.1	3.1	3.1
Agree	13	40.6	40.6	43.8
Valid Strongly Agree	18	56.3	56.3	100.0
Total	32	100.0	100.0	

Table 4.8 make known that a massive part 96.9%of the respondents have experienced enhanced performance and productivity as a result of their production strategy. Only 3.1% of the respondents were unsure if their performance and productivity has improved due to them implementing a production strategy; however this is not a bad thing as the 3.1% can be deemed to be in agreement since there was no disagreement. From these results one can deduce that the production strategies used in the operations of the respondents are effective.

#### 4.4.3.3 Question Seven

**Table 4.9: Your production strategy contributes to the reduced waste in your operation**

	Frequency	Percent	Valid Percent	Cumulative Percent
Unsure	3	9.4	9.4	9.4
Agree	12	37.5	37.5	46.9
Valid Strongly agree	17	53.1	53.1	100.0
Total	32	100.0	100.0	

Table 4.9 reveals that a large percentage of respondents agree that their production strategy has contributed to reduced waste in their operation with 37.5% of the respondents in agreement and 53.1% strongly agreeing. 9.4% of the respondents were unsure if their waste has reduced due to the production strategy. Clearly the respondents believe that their processes are efficient in terms of generating the minimum waste. However the 9.4% that was unsure could be linked to poor management or management that does not have control over its operations

#### 4.4.3.4 Question Eight

**Table 4.10: Your product quality has improved since implementing your production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	3.1	3.1	3.1
Unsure	1	3.1	3.1	6.3
Valid Agree	14	43.8	43.8	50.0
Strongly agree	16	50.0	50.0	100.0
Total	32	100.0	100.0	

It is evident from Table 4.10 that the majority of the respondents 93.8% were satisfied with the improvements in their product quality after implementing their production strategies. 43.5% of the respondents agreed with the question with a further 50% strongly agreeing. The respondents that were unsure and those that disagreed were both at 3.1%. The respondents that were unsure or disagreed could have been running their operations efficiently and had experienced employees who gave a lot of attention to quality or they might not be giving enough attention to quality.

#### 4.4.3.5 Question Nine

**Table 4.11: The production strategy has improved your production work flow**

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	3.1	3.2	3.2
Agree	7	21.9	22.6	25.8
Valid Strongly agree	23	71.9	74.2	100.0
Total	31	96.9	100.0	
Missing System	1	3.1		
Total	32	100.0		

Table 4.11 also shows that the large percentage of the respondents has seen some improvements in their production work flow as a result of their production strategies. This is revealed by the 21.9% of respondent in agreement with the question and an overwhelming 71.9% who strongly agreed. The respondents that disagreed were at 3.1% showing that not all respondents have seen better work flow in their operations as a result of their implemented production strategy, and one respondent did not answer the question which amounted to 3.1%. With regard to the 3.1% who disagreed and the 3.1% who were unsure, they too most probably run their processes well and, or have simple production processes.

#### 4.4.4 Part Four

Part four discusses the results of question ten to question twelve which is linked to objective four.

**4.4.4.1 Objective Four:** To determine the overall benefits that production strategies provide to SMMEs in the engineering sector in the Jacobs area.

#### 4.4.4.2 Question Ten

**Table 4.12: Your profitability improved since implementing the production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Unsure	2	6.3	6.3	6.3
Agree	11	34.4	34.4	40.6
Valid Strongly agree	19	59.4	59.4	100.0
Total	32	100.0	100.0	

Table 4.12 reveals that most respondents (93.8%) have experienced an increase in profitability since implementing their production strategies with 34.4% of them agreeing and an overwhelming 59.4% strongly agreeing. Those that were unsure contributed 6.3% to the overall distribution of the respondents. The respondents that were unsure could be running very profitable businesses for them not to notice the improvement

#### 4.4.4.3 Question Eleven

**Table 4.13: Staff morale improved since implementing the production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Unsure	4	12.5	12.5	12.5
Agree	20	62.5	62.5	75.0
Valid Strongly agree	8	25.0	25.0	100.0
Total	32	100.0	100.0	

77.5% of the respondents as shown in Table 4.13 agree that their staff morale has improved since implementing their production strategies. 12.5% of the respondents were unsure if their staff morale has increased as a result of their production strategies. This is a positive indicator as good staff morale results in lower staff turnover and improved productivity and better quality.

#### 4.4.4.4 Question Twelve

**Table 4.14: Staff turnover reduced since implementing the production strategy?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	3	9.4	9.4	9.4
Unsure	6	18.8	18.8	28.1
Valid Agree	12	37.5	37.5	65.6
Strongly agree	11	34.4	34.4	100.0
Total	32	100.0	100.0	

Table 4.14 reveals that the majority of respondents 71.9% have seen a reduction in staff turnover since implementing their production strategies, which is 37.5% agreeing respondents and 34.4% strongly agreeing respondents. 18.8% and 9.4% of the respondents were unsure and disagreed respectively. These results concur with the results/findings in the previous table which indicates consistent and honest answers.

#### 4.4.5 Part Five

The results of question thirteen to question seventeen linked to objective five are discussed in part five

**4.4.5.1 Objective Five:** To determine the risks related with not having production strategies in place.

#### 4.4.5.2 Question Thirteen

**Table 4.15: Your relationships with your customers improved after implementing your production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	17	53.1	53.1	53.1
Valid Strongly agree	15	46.9	46.9	100.0
Total	32	100.0	100.0	

Table 4.15 shows that all the respondents agree that the production strategies have helped them improve their relationships with their customers, which is 53.1% of respondents that agreed and 46.9% that strongly agreed. This overwhelming result can be interpreted as saying that production strategies provide a platform for organisations to improve their relationships with their customers.

#### 4.4.5.3 Question Fourteen

**Table 4.16: You now understand your business capabilities better and are able to relate that better to your customers**

	Frequency	Percent	Valid Percent	Cumulative Percent
Unsure	1	3.1	3.1	3.1
Agree	17	53.1	53.1	56.3
Valid Strongly agree	14	43.8	43.8	100.0
Total	32	100.0	100.0	

In Table 4.16, an overpowering 96.9% of respondents felt that they now understand their business capabilities better and are able to relate better to their customers. This is evidently shown by the 53.1% of respondents who agreed and 43.8% of the respondents who strongly agreed. There was a single respondent who was unsure and that amounted to 3.1%, which could be linked to a well run business.

#### 4.4.5.4 Question Fifteen

**Table 4.17: You experienced a lot of chaos in your operations before implementing your production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	4	12.5	12.5	12.5
Disagree	5	15.6	15.6	28.1
Valid Unsure	1	3.1	3.1	31.3
Agree	14	43.8	43.8	75.0
Strongly agree	8	25.0	25.0	100.0
Total	32	100.0	100.0	

Table 4.17 shows the distribution of respondents and reveals that the majority of the respondents 68.8% were experiencing a lot of chaos in their operations before implementing the production strategy. This is followed by respondents who disagree at 15.6% and strongly disagree at 12.5%. The 3.1% of the respondents were unsure if there was chaos before implementing the production strategy. With 28% in disagreement one must accept that the term “chaos” was probably a little strong. It was used to determine just how many firms were badly run in terms of production prior to the new systems being implemented. Based on the affirmative responses where 69% agreed, this illustrates that new processes improved flow of goods and materials through the production process and improved efficiencies.

**4.4.5.5 Question Sixteen**

**Table 4.18: You were unable to meet your customer demand before implementing the production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	5	15.6	15.6	15.6
Disagree	5	15.6	15.6	31.3
Valid Unsure	3	9.4	9.4	40.6
Agree	14	43.8	43.8	84.4
Strongly agree	5	15.6	15.6	100.0
Total	32	100.0	100.0	

The responses on Table 4.18 above indicate that 59.4% of the respondents agree that they were not able to meet their customer demands before implementing their production strategies. The 59.4% of the respondents who agree comprises 43.8% agreements and 15.6% of those who strongly agreed. 31.2% of the respondents disagree with the question, which contains 15.6% disagreements and 15.6% that strongly disagreed, whilst 9.4% of the respondents were unsure. One weakness of this question being that it did not test to determine if after implementing the new processes



production was improved. That though is implied based on responses to earlier statements.

#### 4.4.5.6 Question Seventeen

**Table 4.19: Your quality was compromised by not having a production strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	1	3.1	3.1	3.1
Disagree	5	15.6	15.6	18.8
Valid Unsure	5	15.6	15.6	34.4
Agree	14	43.8	43.8	78.1
Strongly agree	7	21.9	21.9	100.0
Total	32	100.0	100.0	

The majority of the respondents (65.7%) on Table 4.19 agree that before implementing their production strategies their quality was compromised. This is followed by disagree at (15.6%), unsure at (15.6%), and strongly disagree at (3.1%). These findings indicate the benefits of sound production processes.

#### 4.5 Summary

The results and findings from the field work were discussed and presented in chapter 4. Each objective was discussed within the context of the relevant questions. The results closely relate to the findings from the literature review; however these are be discussed in detail in chapter 5. The objectives that were discussed revealed the following findings from the respondents:

- Objective one, which was about finding out which production strategies SMMEs employ in their operations, revealed that the majority use lean manufacturing and JIT.

- Objective two, which evaluated the challenges faced by SMMEs in implementing production strategies, showed that the majority of SMMEs do face challenges when implementing production strategies.
- Objective three, seeks to determine in the effectiveness and productivity improved as a result of implementing production strategies and the findings were that indeed there was increase in these two areas as shown by the results from the respondents.
- Objective four evaluated the overall benefits that SMMEs receive from implementing production strategies, the results show that a majority did benefit overall from implementing these production strategies.
- Objective five, which seeks to determine the risks related to implementing productions strategies revealed that there were risks involved as the majority of respondents showed that they had experienced some risks.

The analysis of the findings revealed that SMMEs use production strategies and that they face challenges in implementing these production strategies. On the other hand, the positive aspect being that they received a lot of benefits from these production strategies such as improved productivity and overall operational improvement. Chapter Five looks at both the field findings and the literature review; they are discussed with the aim of providing answers to the objectives of this study.

## **CHAPTER FIVE**

### **CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter discusses the field findings presented in chapter 4. The findings are detailed and contrasted with the literature review findings, conclusions and recommendations are then made against that backdrop. This research was based on a small sample of 30 SMMEs operating in the Jacobs area in Durban. This quantitative study was designed to yield accurate, concise, replicable and generalizable findings.

#### **5.2 Conclusions and Recommendation Linked to Objectives**

##### **5.2.1 Objective One**

This objective sought to identify what production strategies are employed by SMMEs.

#### **Findings**

**Literature:** It is shown in the literature review that the understanding and proper implementation of sound production strategies provide organisations with the competitive advantage required in today's business environment. The production strategies discussed in the literature review were lean manufacturing, the Balanced Scorecard, Six Sigma, plant layout, Just in Time manufacturing and Total Planned Maintenance. The benefits and effectiveness of these various processes and tools of lean manufacturing were substantiated; these benefits were considered to be the enablers of business competitive edge that makes them better than the competitors and are able to provide its customers the flexibility that they require.

The Investigation of the balanced scorecard (BSC) proved that it is not a system of use solely for large organisations but is also suitable for SMMEs. Six Sigma requires a solid organisational infrastructure, where management commitment is said to be the number one critical success factor as a lack of senior management commitment results in a weakened Six Sigma initiative. The benefits of lean

layout designs were revealed as improved labour productivity and better flow through the production process. JIT provides the benefits of small lot sizes at reduced cycle times and improved flexibility to organisations which suits SMMEs. Companies that have successfully implemented TPM, show a growth of employees, with new skills being learnt, increased work efficiency, reduction in breakdowns, reduction in the number of accidents, reduction of waste, improved quality and reduction of customer complaints.

**Field Work:** The findings from the field respondents revealed that the majority of respondents use lean manufacturing and JIT, both of which had 28.1% apiece. Six sigma at 18.8% was at second place in term of the distribution of usage, together with TPM at the same percentage of 18.8%. The balanced score card was the least used production strategy according to the respondents at 18.0%.

## **Conclusion**

Deducing from the findings it can be concluded that from the product strategies discussed in the literature and the production strategies selected by the majority of the respondents they were the most likely to be selected for the following reasons. Lean manufacturing according to the literature provides flexibility and competitive edge, while JIT provides a platform for small lot sizes and reduced cycle times, which are the benefits that SMMEs should look for in a production strategy to reduce inventory costs and increase flexibility. Furthermore it should be noted that the distribution of the respondents was across all production strategies discussed which is a good thing as it is expected that different businesses will choose different strategies depending on their needs, experience and growth prospects.

## **Recommendations**

The lists of production strategies discussed in this study are not exhaustive and a number of strategies can be employed in one organisation at the same time. It is therefore recommended for organisations to conduct thorough research when choosing a production strategy and they must bear in mind that there are numerous production and management strategies to evaluate before selecting one for their organisation. A

qualitative study was more appropriate for this type of problem as it would have revealed more variables and relationships between production strategies and SMME's.

### **5.2.2 Objective Two**

This objective sought to identify and evaluate challenges experienced by SMMEs in implementing production strategies.

### **Findings**

**Literature:** To begin with the evaluation of the constraints or challenges experienced by SMMEs in implementing production strategies, the constraints that SMMEs experience were explored first and later the challenges of implementing production strategies were discussed under the different production strategies outlined in the literature. The findings in the literature reveal that amongst the constraints faced by SMMEs are the lack of capital to invest in new systems like production strategies; poor levels of education amongst the workforce of most SMMEs and that situation is exacerbated by the lack of training in the SMME community which can be linked to lack of resources and or a staff compliment that does not afford the firm the luxury of allowing people time away from work to undergo training.

The other distressing finding was that there is a lack of managerial competence and that makes it difficult for SMMEs to implement new systems properly or even worse for the managers to understand how to start the process and the system which are meant to help the organisation are soon shelved due to this weakness. Finally the challenge of cultural change amongst SMMEs, is a large issue, this is due to the fact that most SMMEs are owned by one person and they embed their beliefs and culture at the infancy of their organisations and for them to change at a later stage becomes a challenge. If management finds it hard to accept or change for the betterment of the organisation then worse can be expected from the employees of that organisation.

**Field Work:** In the questionnaire four questions were asked regarding the challenges that SMMEs experience when implementing production strategies.

The questions asked were whether or not respondents experienced constraints around costs, resistance to change, uncertainty of whether the system will work and lastly if they experienced any disruptions in the process of implementing. The findings across all four questions were overwhelming, 68.8% of the respondents agreed that cost was a constraint, 75% of the respondent said that they did experience resistance to change when implementing their production strategy, 57% stated that they took the uncertainty of the unknown into consideration when choosing and implementing their production strategy and finally 56% of the respondents experienced some disruption during the implementation process.

### **Conclusion**

The findings from the literature and field work yielded the same results that there are challenges when implementing production strategies. Both the findings also revealed that cost, resistance to change, the uncertainty of the unknown and disruptions in operations are amongst the constraints that should be anticipated when considering implementing production strategies.

### **Recommendations**

Taking into consideration that challenges and constraints are almost inevitable when implementing production strategies, SMMEs implementing or considering implementing production strategies should remember the following; first that the impact of these challenges can be cushioned with the correct planning and managerial support. Secondly, as discussed in the literature that education, communication, managerial commitment and a proper organisational infrastructure are the cornerstone of any production strategy. Therefore it is recommended that before embarking on this journey there should be management commitment and involvement, training should be done to prepare the employees of the new changes and lastly communication should be prioritised to ensure that all the stakeholders are kept abreast with the progress.

### 5.2.3 Objective Three

This objective sought to review and evaluate the effectiveness of production strategies in the SMMEs operations.

#### Findings

**Literature:** Effectiveness is described as the capability of producing a desired result or outcome (Dictionary. com, 2011). The findings of the literature across all production strategies discussed in this study, found that the desired results or outcomes of the production strategies were similar. The desired results are that an organisation employing a production strategy should achieve shorter production cycle times, it should be able to reduce or eliminates all types of waste, the production costs are reduced meaning that it produces cheaper than its competition, the rework and errors are reduced, the set up times are reduced, inventory costs are reduced, the product quality is improved, productivity is increased and the overall equipment effectiveness is improved.

The findings revealed that if an organisation is performing or producing and achieving any of these above mentioned results due to the production strategy it is employing then that production strategy is effective.

**Field Work:** To evaluate the effectiveness of production strategies used by the respondents in their operations four questions were asked. The questions asked required that the respondents affirm if they had achieved the following results; enhanced performance, reduced waste, improved product quality and better production workflow.

As discussed in chapter 4 the response to all these questions were resoundingly in support of the concepts, almost 90% of the respondents across the questions agreed that they have achieved enhanced performance, reduce, waste, improved quality and better production workflow, through improved production strategies.

## **Conclusion**

From the findings discussed above it can be concluded that the result of the literature and the fieldwork concur. Furthermore it can also be concluded that to determine if a production strategy is effective more especially the ones discussed in this paper, the results of the organisation should show an improved performance, reduced waste, improved quality and better flow of production.

## **Recommendations**

It is recommended that the organisations should stipulate their desired results at the beginning of the process of acquiring and implementing a production strategy as the results mentioned in this study are not exhaustive. Furthermore, for these results to be achieved it is recommended that the following need to be in place:

- Clear sense of direction on the long term strategic goals for the organisation.
- Thorough understanding of the business model or production strategy.
- The organisation must have the ability to focus and prioritise initiatives.
- The organisation must poses an ability to change

### **5.2.4 Objective Four**

To determine the overall benefits that production strategies provide to SMMEs in the engineering sector in the Jacobs area.

## **Findings**

**Literature:** For the purpose of this study benefits were limited to profitability, improved staff morale and reduced staff turnover. In term of profitability it was found that an effective organisation benefits from improved profitability as the non value adding activities are eliminated. It can also be inferred that effectiveness in operations improves staff moral and reduce staff turnover.

**Field Work:** The findings of the field work were based on the questions of increased profitability, increased staff morale and reduced staff turnover. The respondents stated that they had benefited from increase profitability since implementing their production strategy with a 93.8% of the respondents agreeing to that question. Some 77.5% of the respondents agreed that their staff morale



has improved with 71.9% also stating that their production strategy has reduced the staff turnover. The total results across the questioned can be assumed to be agreeing with the questions as the other responded stated that they were unsure if they had benefited without disagreeing with the questions.

## **Conclusion**

It is concluded that taking the findings into the results of the literature review and the fieldwork concur. The evidence reveals that implementing production strategies provides benefits such as the following; reduced waste, increased profitability, fewer rejects, increased client satisfaction, improved staff morale and reduced staff turnover.

## **Recommendations**

Clearly the above strategies add value to a firm and they need to be adopted and adapted as and when processes change. The literature did not discuss in depth, the impact of production strategies on staff morale and turnover. It is there for recommended that SMMEs implementing or planning to implement production strategies should conduct thorough research around these issues. Furthermore a study to research the impact of production strategies on employees is recommended.

### **5.2.5 Objective Five**

Objective five was to determine the risks related with not having production strategies in place.

## **Findings**

**Literature:** Literature indicates that the risks refer to matters that can cause a company to be inefficient and less profitable as a result of not having a sound production strategy. The findings in the literature reveal that when implementing a production strategy organisations are forced to review their processes, performance, and their sources of waste and non value adding activities which provided it with a better understanding of their business capabilities. The literature also reveals that organisations without production strategies have chaos due to high waste, high inventories and a lot of non value adding activities. With all the chaos it can be assumed that these organisations are not able to

meet their customer demands. Finally it revealed that production strategies provide organisations with improved quality and reduced rework which raises a notion that organisations without production strategies suffer from compromised quality products.

**Field Work:** The findings from the field work revealed that production strategies help organisations understand their business capabilities better. Based on the affirmative responses from the respondents, it is illustrated that new processes improved flow of goods and materials through the production process and improved efficiencies. The majority of the respondents agree that before implementing their production strategies their quality was compromised. The findings the field work affirm the fact that production strategies help alleviate the risks that organisations without production strategies encounter.

## **Conclusion**

The results from the literature and the field findings concur. The literature and the respondents to the questionnaire agree that production strategies help to alleviate the risk that organisations could have encountered if they did not have them in place. Furthermore it can also be concluded that organisations without production strategies could lose their customers as their relationships with their customers is compromised due to the chaos and poor quality associated with not having production strategy.

## **Recommendations**

One weakness in the quest to answer this objective is that a question to determine if after implementing the new processes production was improved was not asked. That though is implied based on responses to earlier statements. It is therefore recommended that a subsequent study be done to further identify if productivity improvement occurs as a result of implementing a production strategy.

## **5.3 Suggestion for Further Research**

It is recommended that a rigorous study be conducted on SMMEs that do not use production strategies to determine if their effectiveness and profitability is any different to SMMEs that employ production strategies. A qualitative study on SMMEs should also

be considered to evaluate if there are any production strategies not discussed in this study that deliver the same results or better. There is merit in researching big business that employs the same production strategies to identify if the results are similar to those experienced by SMMEs.

#### **5.4 Concluding Remarks**

This research had added knowledge concerning factors that small and medium business owners need to take into consideration when developing strategies to grow their businesses. These factors are discussed in detail under this chapter. The factor relating to Objective One was confirmed that SMMEs also used widely researched and tested strategies. Objective Two revealed that there are challenges when implementing production strategies; however measures to alleviate those challenges were mentioned. It was recommended that SMME owners considering implementing production strategies should evaluate them thoroughly against the objectives and requirements of the organisation to ensure a sound choice and success of their initiatives. The issue of effectiveness brought by production strategies was confirmed in Objective Three. The benefits of production strategies which were evaluated under Objective Four were confirmed by respondents as real benefits. Objective Five sought to evaluate the risks associated with not having a production strategy and it was concluded that sound production strategies help in minimizing such risks and that businesses without production strategies are vulnerable to be adversely affected by these risks.

In conclusion, if SMME owners and in particular those intending to implement new production strategies make an effort to comprehend the information in this study especially the issues raised in chapter four and five, they will reduce the risk associated with implementing production strategies and improve the effectiveness and profitability of their businesses. In so doing they will help contribute to job creation, reduced labour turnover, more efficient production and financial success.

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## 7. APPENDICES

### Appendix 1

#### Correlation Analysis

Correlations			
		Do you think that cost is a negative factor when it comes to implementing production strategies?	Has your profitability improved since implementing the production strategy?
Do you think that cost is a negative factor when it comes to implementing production strategies?	Pearson Correlation	1	.269
	Sig. (2-tailed)		.144
	N	31	31
Has your profitability improved since implementing the production strategy?	Pearson Correlation	.269	1
	Sig. (2-tailed)	.144	
	N	31	32

The correlation ( $r$ ) between the cost as a negative factor when it comes to implementing production strategies and profitability improving since implementing the production strategy is 0.269. The co-efficient in these variables shows that the relationship between cost as a negative factor when it comes to implementing production strategies and profitability improving since implementing the production strategy is weak. The probability ( $p$ ) of this correlation coefficient which is 0.144 is greater than 0.05 thus implying that there is no statistically significant relationship between cost as a negative factor when it comes to implementing production strategies and profitability improving since implementing the production strategy ( $r=-0.269$ ,  $p>0.05$ )



**Correlations**

		Did you experience a lot of resistance to change when implementing your production strategy?	Was uncertainty of the unknown a factor that was considered when deciding on the production strategy?
Did you experience a lot of resistance to change when implementing your production strategy?	Pearson Correlation	1	.342
	Sig. (2-tailed)		.055
	N	32	32
Was uncertainty of the unknown a factor that was considered when deciding on the production strategy?	Pearson Correlation	.342	1
	Sig. (2-tailed)	.055	
	N	32	32

The correlation ( $r$ ) between experiencing a lot of resistance to change when implementing the production strategy and uncertainty of the unknown a factor that was considered when deciding on the production strategy is 0.342. The co-efficient in these variables shows that the relationship between experiencing a lot of resistance to change when implementing the production strategy and uncertainty of the unknown a factor that was considered when deciding on the production strategy is weak. The probability ( $p$ ) of this correlation coefficient which is 0.055 is greater than 0.05 thus implying that there is no statistically significant relationship between experiencing a lot of resistance to change when implementing the production strategy and uncertainty of the unknown a factor that was considered when deciding on the production strategy ( $r=0.342$ ,  $p>0.05$ ).

**Correlations**

		Were there any disruption caused while to your production while implementing your production strategy?	Did you experience a lot of chaos in your operations before implementing your production strategy?
Were there any disruption caused while to your production while implementing your production strategy?	Pearson Correlation Sig. (2-tailed) N	1  32	.002 .991 32
Did you experience a lot of chaos in your operations before implementing your production strategy?	Pearson Correlation Sig. (2-tailed) N	.002 .991 32	1  32

The correlation ( $r$ ) between any disruption caused while to your production while implementing your production strategy and experiencing a lot of chaos in your operations before implementing your production strategy is 0.002. The co-efficient in these variables shows that the relationship between any disruption caused while to your production while implementing your production strategy and experiencing a lot of chaos in your operations before implementing your production strategy is weak. The probability ( $p$ ) of this correlation coefficient which is 0.991 is greater than 0.05 thus implying that there is no statistically significant relationship between any disruption caused while to your production while implementing your production strategy and experiencing a lot of chaos in your operations before implementing your production strategy ( $r=-0.002$ ,  $p>0.05$ ).

**Correlations**

		Does your production strategy provide enhanced performance and productivity?	Has your product quality improved since implementing your production strategy?
Does your production strategy provide enhanced performance and productivity?	Pearson Correlation Sig. (2-tailed) N	1  32	.407* .021 32
Has your product quality improved since implementing your production strategy?	Pearson Correlation Sig. (2-tailed) N	.407* .021 32	1  32

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

The correlation (r) between production strategy providing enhanced performance and productivity and product quality improving since implementing your production strategy is 0.407. The co-efficient in these variables shows that the relationship between production strategy providing enhanced performance and productivity and product quality improving since implementing your production strategy is weak. The probability (p) of this correlation coefficient which is 0.021 is greater than 0.05 thus implying that there is no statistically significant relationship between production strategy providing enhanced performance and productivity and product quality improving since implementing your production strategy ( $r=0.407$ ,  $p>0.05$ )

**Correlations**

		Does your production strategy contribute to the reduced waste in your operation?	Do you think that cost is a negative factor when it comes to implementing production strategies?
Does your production strategy contribute to the reduced waste in your operation?	Pearson Correlation	1	.224
	Sig. (2-tailed)		.226
	N	32	31
Do you think that cost is a negative factor when it comes to implementing production strategies?	Pearson Correlation	.224	1
	Sig. (2-tailed)	.226	
	N	31	31

The correlation ( $r$ ) between production strategy contributing to the reduced waste in your operation and cost as a negative factor when it comes to implementing production strategies is 0.224. The co-efficient in these variables shows that the relationship between production strategy contributing to the reduced waste in your operation and cost as a negative factor when it comes to implementing production strategies is weak. The probability ( $p$ ) of this correlation coefficient which is 0.226 is greater than 0.05 thus implying that there is no statistically significant relationship between production strategy contributing to the reduced waste in your operation and cost as a negative factor when it comes to implementing production strategies ( $r=0.224$ ,  $p>0.05$ ).

**Correlations**

		Has the production strategy improved your production work flow?	Has your profitability improved since implementing the production strategy?
Has the production strategy improved your production work flow?	Pearson Correlation Sig. (2-tailed) N	1 31	.666** .000 31
Has your profitability improved since implementing the production strategy?	Pearson Correlation Sig. (2-tailed) N	.666** .000 31	1 32

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

The correlation (r) between production strategy improving your production work flow and r profitability improved since implementing the production strategy is 0.666. This coefficient shows that there is a strong and positive relationship between production strategy improving your production work flow and r profitability improved since implementing the production strategy. The probability (p) of this correlation coefficient which is 0.000 is lesser than 0.05 thus implying that there is statistically significant relationship between production strategy improving your production work flow and r profitability improved since implementing the production strategy (r=0.666, p>0.05).

**Correlations**

		Has your staff morale improved since implementing the production strategy?	Has your staff turnover reduced since implementing the production strategy?
Has your staff morale improved since implementing the production strategy?	Pearson Correlation	1	.171
	Sig. (2-tailed)		.349
	N	32	32
Has your staff turnover reduced since implementing the production strategy?	Pearson Correlation	.171	1
	Sig. (2-tailed)	.349	
	N	32	32

The correlation (r) between staff morale improvement since implementing the production strategy and staff turnover reduced since implementing the production strategy is 0.171. The coefficient in these variables shows that the relationship between staff morale improvement since implementing the production strategy and staff turnover reduced since implementing the production strategy is weak. The probability (p) of this correlation coefficient which is 0.349 is greater than 0.05 thus implying that there is no statistically significant relationship between staff morale improvement since implementing the production strategy and staff turnover reduced since implementing the production strategy ( $r=0.171$ ,  $p>0.05$ ).

**Correlations**

		Did you find that your relationships with your customers improved since implementing your production strategy?	Do you find that you now understand your business capabilities better and are able to relate that better to your customers?
Did you find that your relationships with your customers improved since implementing your production strategy?	Pearson Correlation Sig. (2-tailed) N	1  32	.444* .011 32
Do you find that you now understand your business capabilities better and are able to relate that better to your customers?	Pearson Correlation Sig. (2-tailed) N	.444* .011 32	1  32

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

The correlation (r) between finding that your relationships with your customers improved since implementing your production strategy and find that you now understand your business capabilities better and are able to relate that better to your customers is 0.444. This coefficient shows that there is a strong and positive relationship between finding that your relationships with your customers improved since implementing your production strategy and find that you now understand your business capabilities better and are able to relate that better to your customers. The probability (p) of this correlation coefficient which is 0.011 is lesser than 0.05 thus implying that there is statistically significant relationship between finding that your relationships with your customers improved since implementing your production strategy and find that you now understand your business capabilities better and are able to relate that better to your customers (r=0.444, p<0.05).

**Correlations**

		Were you not able to meet your customer demand before implementing the production strategy?	Was your quality compromised by not having a production strategy?
Were you not able to meet your customer demand before implementing the production strategy?	Pearson Correlation	1	.569**
	Sig. (2-tailed)		.001
	N	32	32
Was your quality compromised by not having a production strategy?	Pearson Correlation	.569**	1
	Sig. (2-tailed)	.001	
	N	32	32

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

The correlation (r) between not being able to meet your customer demands before implementing the production strategy and quality compromised by not having a production strategy is 0.569. This coefficient shows that there is a strong and positive relationship between not being able to meet your customer demands before implementing the production strategy and quality compromised by not having a production strategy. The probability (p) of this correlation coefficient which is 0.001 is lesser than 0.05 thus implying that there is statistically significant relationship between not being able to meet your customer demands before implementing the production strategy and quality compromised by not having a production strategy (r=0.569, p<0.05).

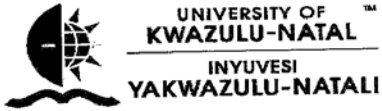


**Correlations**

		Which of the following production strategies do you employ in your operations?	Do you think that cost is a negative factor when it comes to implementing production strategies?
Which of the following production strategies do you employ in your operations?	Pearson Correlation	1	.239
	Sig. (2-tailed)		.196
	N	32	31
Do you think that cost is a negative factor when it comes to implementing production strategies?	Pearson Correlation	.239	1
	Sig. (2-tailed)	.196	
	N	31	31

The correlation ( $r$ ) between production strategies do you employ in your operations and cost as a negative factor when it comes to implementing production strategies is 0.239. The co-efficient in these variables shows that the relationship between production strategies do you employ in your operations and cost as a negative factor when it comes to implementing production strategies is weak. The probability ( $p$ ) of this correlation coefficient which is 0.196 is greater than 0.05 thus implying that there is no statistically significant relationship between production strategies do you employ in your operations and cost as a negative factor when it comes to implementing production strategies ( $r=0.239$ ,  $p>0.05$ ).

## Appendix 2 Ethical Clearance



10 October 2012

Mr Abia Rakoma 210515646  
Graduate School of Business and Leadership  
Westville Campus

Dear Mr Rakoma

Protocol reference number: HSS/1000/012M  
Project title: Production Strategy Employed by Small, Medium and Micro Engineering Enterprises in the Jacobs Area .

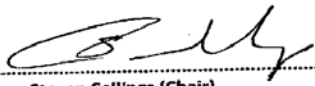
### EXPEDITED APPROVAL

I wish to inform you that your application has been granted Full Approval through an expedited review process.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the school/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

  
.....  
Professor Steven Collings (Chair)

/pm

cc Supervisor: Mr Alex Bozas  
cc Academic Leader: Dr S Bodhanya  
cc School Admin: Mrs Wendy Clarke

Professor S Collings (Chair)  
Humanities & Social Sc Research Ethics Committee  
Westville Campus, Govan Mbeki Building  
Postal Address: Private Bag X54001, Durban, 4000, South Africa  
Telephone: +27 (0)31 260 3587/8350 Facsimile: +27 (0)31 260 4609 Email: ximbap@ukzn.ac.za / snymanm@ukzn.ac.za  
Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

INSPIRING GREATNESS



## Appendix 3

### Informed Consent Letter

**UNIVERSITY OF KWAZULU-NATAL  
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP**

Dear Respondent,

**MBA Research Project**  
**Researcher:** Abia Rakoma 082-5227191  
**Supervisor:** Alec Bozas 082-3344477  
**Research Office:** Ms P Ximba 031-2603587

I am **Abia Sibongiseni Rakoma** an MBA student, at the Graduate School of Business and Leadership, of the University of KwaZulu Natal. You are invited to participate in a research project entitled, Production Strategy Employed by Small, Medium and Micro Engineering Enterprises in the Jacobs Area. The aim of this study is to identify whether or not the SMME's in the engineering sector are using researched and widely used production strategies in their operations. Secondly the study will consider what value SMME does receive from utilising production strategies and if this value is translated to customer satisfaction and profitability.

Through your participation I hope to understand if SMME's in the engineering sector at the Jacobs area use production strategies, what type of strategies do they use and what value they derive from these strategies. The results of the focus group are intended to contribute to SMME owners/ managers, who will benefit from understanding the benefits of using production strategies and also to contribute to the knowledge of service providers and consultants of production strategies.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this survey/focus group. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me or my supervisor at the numbers listed above.

The survey should take you about **15** minutes to complete. I hope you will take the time to complete this survey.

Sincerely

Investigator's signature \_\_\_\_\_ Date \_\_\_\_\_

**This page is to be retained by participant**

**UNIVERSITY OF KWAZULU-NATAL  
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP**

**MBA Research Project**  
**Researcher:** Abia Rakoma 082-5227191  
**Supervisor:** Alec Bozas 082-3344477  
**Research Office:** Ms P Ximba 031-2603587

**CONSENT**

I..... (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT

DATE

.....

**This page is to be retained by researcher**

**Appendix 4**  
**Questionnaire**

**UNIVERSITY OF KWAZULU-NATAL**  
**GRADUATE SCHOOL OF BUSINESS & LEADERSHIP**

**MBA Research Project**

**Researcher:** Abia Rakoma 082-5227191

**Supervisor:** Alec Bozas 082-3344477

**Research Office:** Ms P Ximba 031-2603587

**Production Strategy Employed by Small, Medium and Micro Engineering  
Enterprises in the Jacobs Area**

The purpose of this survey is to solicit information from SMME's in the Jacobs area regarding the production strategies they employ in their operations. The information and ratings you provide us will go a long way in helping us identify the value that SMME's derive from these strategies and to also identify if these strategies contribute to customer satisfaction and profitability. The questionnaire should only take **15** minutes to complete. In this questionnaire, you are asked to indicate what is true for you, so there are no "right" or "wrong" answers to any question. Work as rapidly as you can. If you wish to make a comment please write it directly on the booklet itself. Make sure not to skip any questions. Thank you for participating.

## Questions

1. Which of the following production strategies do you employ in your operations? <b>Please tick box next to the strategy applicable to your operation</b>	
<b>Lean manufacturing</b> ( <i>It is a production practice that considers the expenditure of resources for any goal other than the creation of <u>value</u> for the end customer to be wasteful, and thus a target for elimination</i> )	
<b>Balanced score card</b> ( <i>A set of performance measures that are congruent with assessing improvement in financial, customer, and business process outcomes</i> )	
<b>Six sigma</b> ( <i>A quality-improvement performance measurement system that stresses the continual improvement of business processes through reduction of errors</i> )	
<b>Layout</b> ( <i>Layout principles are about determining the way in which materials and other inputs like people and information flow through the operation</i> )	
<b>JIT</b> ( <i>It is a production strategy that strives to improve a business <u>return on investment</u> by reducing in-process <u>inventory</u> and associated <u>carrying costs</u></i> )	
<b>TPM</b> ( <i>TPM is a maintenance process developed for improving productivity by making processes more reliable and less wasteful</i> )	

**For the following questions please tick the number that most closely represents your experience:  
1 = Strongly disagree; 2 = Disagree; 3 = Unsure; 4 = Agree; 5 = Strongly agree**

2. Do you think that cost is a negative factor when it comes to implementing production strategies?	1	2	3	4	5
3. Did you experience a lot of resistance to change when implementing your production strategy?	1	2	3	4	5
4. Was uncertainty of the unknown a factor that was considered when deciding on the production strategy?	1	2	3	4	5
5. Were there any disruption caused while to your production while implementing your production strategy?	1	2	3	4	5
6. Does your production strategy provide enhanced performance and productivity?	1	2	3	4	5
7. Does your production strategy contribute to the reduced waste in your operation?	1	2	3	4	5
8. Has your product quality improved since implementing your production strategy?	1	2	3	4	5
9. Has the production strategy improved your production work flow?	1	2	3	4	5
10. Has your profitability improved since implementing the production strategy?	1	2	3	4	5

11. Has your staff morale improved since implementing the production strategy?	1	2	3	4	5
12. Has your staff turnover reduced since implementing the production strategy?	1	2	3	4	5
13. Did you find that your relationships with your customers improved since implementing your production strategy?	1	2	3	4	5
14. Do you find that you now understand your business capabilities better and are able to relate that better to your customers?	1	2	3	4	5
15. Did you experience a lot of chaos in your operations before implementing your production strategy?	1	2	3	4	5
16. Were you not able to meet your customer demand before implementing the production strategy?	1	2	3	4	5
18. Was your quality compromised by not having a production strategy?	1	2	3	4	5
19. Was your quality compromised by not having a production strategy?	1	2	3	4	5

Comments:

**End of the Questionnaire**

Thank you for taking the time to complete the questionnaire.