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School of Mechanical, Industrial & Aeronautical Engineering

A case study of the impact of human factors to implementation of ISO 9000 in a manufacturing SME in South Africa.

A research report submitted to the School of Mechanical, Industrial and Aeronautical Engineering, University of Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Engineering: Industrial

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Supervisor: Ms. Bernadette Sunjka

January 2015

Declaration

I, Sylvester Takawira declare that this research report is my own work, unaided work. It is submitted in partial fulfillment of the requirements for the degree of Masters of Science (Industrial engineering) at the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Sylvester Takawira

19 January 2015

Abstract

The research sought to discover the impact of human factors to ISO 9000 with the intention of trying to establish how the human factor component contributes to failed or successful implementation of the Quality Management System (QMS).

The research established that within a company the human factor component can be split into two segments, the general employee segment and the management segment since each has its distinct impact to business.

The research thus found out:

- Management‘s leadership skills have a key role in determining successful implementation of ISO 9000.
- Employees’ intellectual abilities and competence level have a role on effective implementation of the standard.

The above two human factor elements were found to impact on the implementation of the standard at three different stages which were: before, during and after implementation.

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List of Abbreviations

BBBEE - Broad-Based Black Economic Empowerment

BRICS – Brazil, Russia, India, China and South Africa

BS– British Standards

CEO – Chief Executive Officer

EN – European standards

EQ – Emotional intelligence

GE– General Electric

HRDF - Human Resource Development Fund

IBM - The International Business Machines Corporation

IQ- Intelligence quotient

ISO – International Organization of Standards

IT – Information Technology

LAN- Local Area Network

M.D– Managing Director

MBA – Master of Business Administration

n.d– No date

NCR– Non-conformance report

PQA – Process Quality Association

QA – Quality assurance

QC – Quality control

QMS – Quality management systems

ROI – Return on investment

SA – South Africa

SABS - South African Bureau of Standards.

SEDA – Small Enterprise Development Agency

SME – Small and Medium Enterprise

SMIDEC-Small and Medium Industries Development Corporation

TBD– To Be Determined

TQM – Total Quality Management

USA– United States of America

WIP –Work-in-progress

Wits– Witwatersrand University

Glossary of Terms

For the purpose of this research, below is how terms below were used.

- Bias -Any tendency which prevents unprejudiced consideration of a question.
- Casual employees – Employees on renewable or non-renewable short contracts ranging from one month to six months.
- Dos and don'ts – A short form of work guidelines for simple instructions on how to do and how not to do work.
- Emotional intelligence – Measure of ability to identify, assess and control the emotions of oneself, of others and of groups.
- Intellectual quotient – Measure of relative intelligence determined by a standardized test.
- Non-conformance report – Report used to record any activity, process or product that does not meet specified procedures.
- Work-in-progress – Goods that are no longer raw material but not yet fully converted into finished products.

Chapter 1: Introduction

1.1 Context of the study

Like in many parts of the world, South African Small and Medium Enterprises (SMEs) are a vital component to economic development of the country. Recently, however, South African (SA) SMEs have faced increased competition from the Western and Eastern world which threatens their growth and ultimate survival (Falkena et al 2008). These foreign competitors threaten them with products which are either cheaper or have superior quality (Steyn 2013). Penetration of the local market by foreign goods has grown to the extent that 50% of manufactured goods in SA are imported (Manufacturing Circle 2012). In some sectors, such as the poultry industry where import tariffs were increased to protect local industries, this is said to have caused increase in prices affecting the consumers negatively (Steyn 2013). At best this will only bring short-term results but may not be sustainable in the long run. This is because the SA economy is an open economy which is highly connected to other foreign markets (Peet and Koch 2005). The very countries competing with local SMEs are the biggest trading partners with SA meaning that all hostile decisions it makes will be counter applied to its exported goods (Falkena et al 2008). Another reason why it will be difficult to fully protect local businesses from foreign competition is that, the SA government is already in long term strategic partnerships with most of these countries through associations such as Brazil, Russia, India, China and South Africa (BRICS), which intend to reduce trade barriers even further (SAinfo 2011). The more trade barriers are removed (which seems to be the inevitable development), the more local SMEs get exposed to stiffer competition leaving them with no choice but to be equally competitive (Krugel 2013).

Pressure is also building from within for South African SMEs. Firstly, the big businesses that SMEs engage within their supply chains are also under economic pressure forcing them to cut off any incapable suppliers to lower their risks (Sunjka and Sklar-Chik 2012). Secondly the informed customers flooded with so many options to choose from are growing more demanding and impatient giving no chance to poorly manufactured products (Dijkkamp 2013)

In response to this, operations and quality improvement initiatives such as Total Quality Management, Lean manufacturing, Just-in-time, ISO 9000 and many others have, thus, been implemented by many businesses to improve internal operations and survive the fierce

competition (Gershon 2010). Amongst these initiatives, ISO 9000 has been the most globally accepted (Poza et al 2009).

Even though some scholars claim that ISO 9000 does not necessarily improve processes but emphasizes following documented procedure, the standard has gained considerable popularity (Gershon 2010). It has, however, been noted by some scholars that the same quality management system bringing positive transformation to one business has yielded no results for another (Cagnazzo et al 2010). The main victims of this scenario have been the SMEs. Most SME owners either do not have enough expertise to evaluate suitability of any Quality management system (QMS) before implementation (Rogerson 2000) or do not have enough capital to attract and retain competent personnel who can effectively implement and operate the QMS (Small Enterprise Development Agency (SEDA) 2012). Much research has already been done worldwide on SMEs' survival and growth through effective utilization of their scarce resources. Most of these studies have however, focused mainly on production or transformation of inputs such as money, hi-tech machines and market demands without first paying attention to the resource that determine effectiveness of all other inputs which is people (SEDA 2012).

Kruger (2008) asserts that all the different inputs involved in a transformation process can be clustered into two groups, i.e. those that get transformed and those that transform other inputs. It is human beings who manage themselves or each other, operate machinery, invest money, design work methods, study and respond to market needs and collaborate from one business to another. In trying to understand the effectiveness of most QMSs, most researchers looked at the behavior of all other resources without much attention to the one interlinking all these resources.

It is from this background above that the purpose of this study arose, that is, to try and understand impact of human factors on ISO 9000 implementation.

1.2 Why Human Factors Impact on ISO 9000?

Of the five main factors of production, which are: natural resources, capital, labour, entrepreneurship, and knowledge, it is the human beings, who through use of their knowledge integrate all other factors to produce goods and services (Nieuwenhuizen and Rossouw 2008). Due to global competition, no matter how popular or useful a product may be, if a business cannot produce it in an efficient, cost-effective manner, the business will most likely suffer (Mulligan 2014). Simple desire to change is, however, not enough. Harrington (2006) believes that an effective management system requires that the

organization step back and define which key drivers for business performance must be changed to in turn effect change of other factors. Brian Joffe, Chief Executive Officer (CEO) for Bidvest Group, believes that a key test of entrepreneurship is how you manage and develop people since this is the highest risk element today and in the near future. (Meyer et al 2011).

Similar Quality Management Systems have been applied to businesses of similar sizes; similar growth intentions; using same consulting firms and yet different business results have been achieved because of the human factor variable (Visser 2012). As a result of this, standards such as ISO 9000 have attracted mixed feeling with some industrialist and scholars claiming astonishing results while others claim little significant change.

The London Process Quality Association's (PQA, 2003) research revealed that, world over, on average; ISO 9000 has helped companies achieve only 16.25% Return on Investment (ROI). On one extreme end some organizations are said to have achieved 1700% ROI, while on the other extreme end some have deteriorated (PQA, 2003).

Performance measurement systems, business intelligence systems, business performance management, scorecards, or dashboards are said to be effective only when the data is being used and converted into insight, knowledge and wisdom (Spitzer 2007). However, no tools are better than the willingness of people to use them correctly and conscientiously (Kumar 1989). People's role and cultural compatibility are critical when a company wants to buy technology (Kumar 1989). Without considering this, it is said that, once the initial glow of the technology implementation wears off, many organizations are often left with a costly technological infrastructure, a big price tag, and a mad dash to do something about the real enablers of high performance that were never put in place (Spitzer 2007). According to Spitzer (2007), the key thing to remember is that a business can purchase a technical infrastructure, but not purchase a social one. Brewer (2010) hinted that, this was the reason why executives must be willing to dig more into the business and understand what incentive structures drive internal company behavior and customer behavior. Spitzer (2007), agreed adding that most performance measurement challenges have turned out to be more about culture than technology.

1.3 The purpose of the study

This research aimed to formulate a proactive approach to ISO 9000 implementation by establishing human activities (the implementation "Dos and Don'ts")that lead to successful

ISO 9000 implementation. Vouzas (2011) recently claimed that most academics and practitioners seemed to be preoccupied with the study and implementation of the "hard" elements of quality improvement (mainly ISO 9000 certification). Salman (2003), however, noted that there were few studies concerning effects after implementation of the quality standard on, working conditions, how process characteristics relate to working conditions and other desired effects.

A void thus emerges. One group of scholars has concentrated on the implementation process, stopping at certification while another group has specialized in the perceived or observed benefits after implementation. This situation leads us to the research purpose and problem statement below.

The research sought to understand how human factors affect the implementation process. In achieving this, the research intended to benefit two groups of SMEs described below:

a) **SMEs interested in ISO 9000 implementation.** The research sought to highlight that, it was not enough to have interest in implementing without knowing factors that bring success or failure.
b) **SMEs not interested in ISO 9000**. Through highlighting what causes successful or unsuccessful implementation, the research sought to clarify on some possible myths and misconceptions about the standard so that these SMEs could make more informed decisions.

Significant research has already been done regarding expected benefits, expenses and different versions of ISO products. These studies have mainly been done from a broad perspective covering a number of companies in a particular region or country. Such studies provide a reliable basis for generalization of what to expect from the area of study (Yin, 2003). Broad based studies, however, have a disadvantage when it comes to gaining depth on a particular area of focus. Having known that ISO 9000 is a helpful management tool, an SME still wants to know what they must do and not do to have successful implementation and get business results worth the price.

Lin and Jang (2004) found that there are four major constructs positively related to business performance. These are top management support, quality planning, employee involvement and continuous improvement. This research focused on two of these, which were the impact of management support and employee involvement. Furthermore these two, are the factors

that have remained constant throughout the evolution of quality yet they have the most impact on all other factors. To add on to this, Arnold (2013) states that if a business does not know where its value is created and does not identify and improve behavior of those people directly responsible for value creation, then no meaningful results will be obtained from any quality improvement intervention.

Further, even though financial indicators such as the PQA (2003) findings quoted earlier on are helpful, they are only indicative but not enough to make a clear decision. According to Army and Army (2007) financial statements simply measure the end results of a process which makes them to be lagging. It was therefore possible to judge ISO 9000 as a good or bad management system by simply reading financial results when in fact other factors were also at play. A process based approach was therefore necessary to establish facts on attributed responsible for the results achieved after implementation.

1.4 Central Research Question:

How do human factors (employees and management) influence the effective implementation (ensuring sustainable growth and competitiveness) of ISO 9000?

1.5 Objectives

The objective of this research was to investigate:

- How employees in an SME influence successful implementation of ISO 9000.
- How management influence successful implementation of ISO 9000 directly or indirectly through their subordinates.

1.6 Research Method

Since the researcher sought to understand what happens during and after ISO 9000 implementation, a longitudinal study approach which evolves over time was used (Yin, 2003). A case study approach was thus used.

The case study focused on how business leaders and employees impact on successful implementation of ISO 9000 at Laursens Engineering. The study paid most attention to issues directly connected to the human factor component even though other factors such as state of machinery and availability of capital have an impact to successful ISO 9000 implementation.

1.7 Limitations and Constrains

i. There was a limitation due to the nature of qualitative case studies because of relying on sensitivity and integrity of the investigator as the primary research instrument for data collection and analysis (Cresswel 2007). All the data collection was however, influenced by Yin's case study protocol and approach (Yin 2009).

ii. There was not much documentation in South Africa about companies which have or are trying to get accredited to ISO 9000. This risked the research to try and reinvent the wheel on some issues by seeking solutions which are already there. Extensive search on literature was however done to avoid this

iii. The company where the case study was being done was old but has been bought by new owners and is now under new management whose leadership style and influence may be very different to the previous one. A motivation factor on this challenge was that it was this new management advocating for ISO 9000 accreditation hence a lot of cooperation was almost guaranteed.

iv. Growth in business itself is associated with buying of new machines, expanding to new customers and increase in orders by the current customers. This meant when coupled with the implementation of ISO 9000, there was a high risk of resistance to change by the workers because of so many new things happening.

1.8 Outline of chapters

To answer the questions of this research, each chapter respectively aimed to achieve objectives below

i. Introduction, Chapter 1, gives the general background of where the research questions were coming from, the research questions, and objectives.

ii. Literature review, Chapter 2, went through what the current literature says in relation to the research topic. This section aimed to add value through establishing what others had said and what the researcher perceived to be missing in the current body of knowledge.

iii. Methodology, Chapter 3, outlined and justified how data was collected, processed and analyzed to answer the research questions.

iv. Results and Analysis, Chapter 4, presented and analyzed what was found during the research which was establishments from the Literature review, data collected in the company during and after implementation and data collected from interviews to other SMEs which implemented ISO 9000.The case study section gave a brief background of the SME under study for easy understanding of where the research findings were coming from.

v. Discussion, Chapter 5, sought to establish how research findings answered the research questions and met objectives. To achieve this data from the SME, literature review and external interviews was discussed to see if there was confirmation of the answers to the research question.

vi. Conclusion, Chapter 6, consolidated the research findings and initial research objectives to justify whether the findings agreed with the hypothesis.

Chapter 2: Literature Review

2.1 Introduction

The purpose of reviewing previous research conducted by academics and practitioners was for the researcher to sharpen his preliminary considerations about any issues related to human factor impact to ISO 9000 implementation, method of study and data collection. To achieve this, a selective review was most appropriate since it focuses on issues related to the research to topic instead of a comprehensive review which works when a new idea is being introduced (Yin 2011).

Currently there is limited documented literature in South Africa about SMEs and ISO 9000 implementation. This is because many small businesses have not been certified for a period long enough to allow meaningful documentation of their experiences with the standard. Most literature surveyed in this research originates from countries such as India, China, Iran, Australia, Taiwan, USA, Spain, Egypt, Greece and Britain. However most of these countries are either in the same economic bracket or ahead of SA making the findings to be applicable now or in the near future.

The literature review was divided into five sections as illustrated in Figure 1 below. This approach helped in clarifying how different factors affect the implementation process in different ways and at different stages.

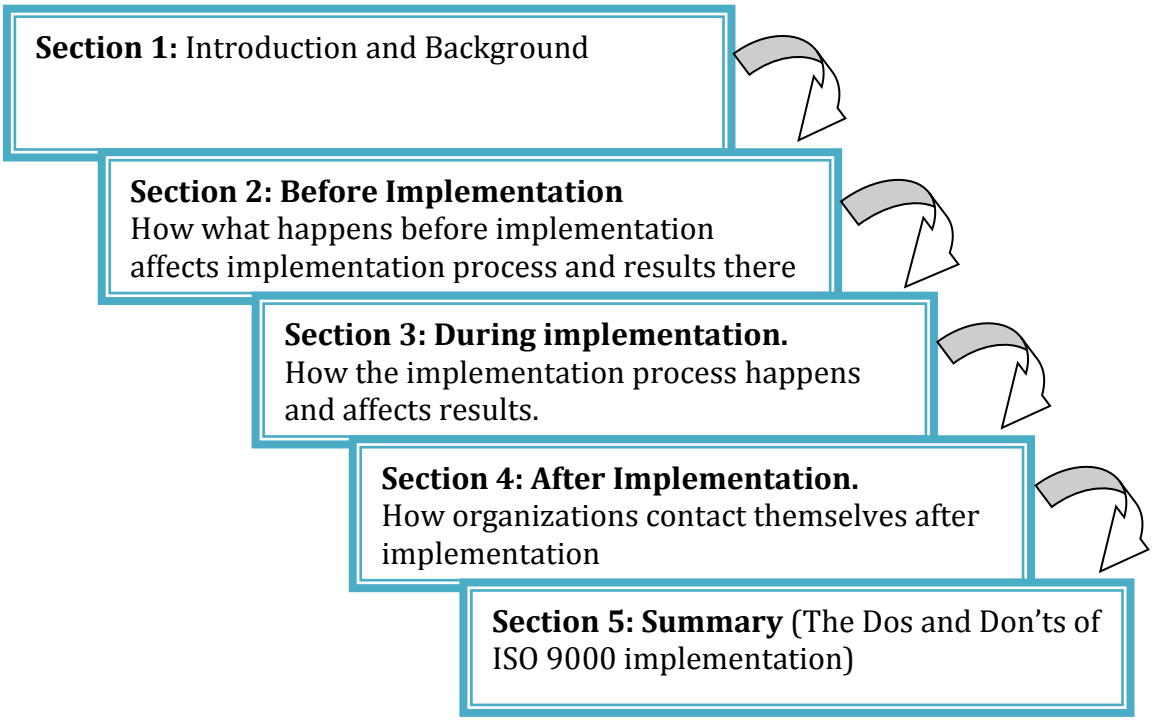


Figure 1: Literature Review Outline

When most scholars and practitioners talk of human factors they focus on the people on the shop floor directly doing the job without enough consideration of the leadership or management yet their impact is very important (Bolden 2007). Those who talk about leadership and supervision mainly talk about what managers should do to the shop floor people and little on what they themselves should do before engaging employees. However, some quality management systems such as the Baldrige criteria have leadership as the first criterion to look at in terms of how this links to all other activities in the business (Gryna et al 2007).

Part of this narrow focus on leadership emerges from the way a manager has generally been defined as merely a person who is in charge or manages other people (Armstrong 2012). This definition mainly focuses on the functional aspect of a manager with no consideration of the characteristics of the manager. This leads to some managers to understanding themselves purely from outside attributes. For applicable results, it is therefore premature to focus on employees without taking a holistic approach on the reciprocal relationship between employees and management which influences each other's behavior. Most importantly management has more influence on a business since they determine who gets employed and how the people should work (Pinchot and Pinchot 1993).

Myers (2008 pp 176) defines ISO 9000 standards as, "a written set of standards that define the basic elements of a management system an enterprise should use to ensure that its products and services meet or exceed customer needs and expectations." The standards are however, a collective of many elements for quality management systems with the common ones being ISO 9000: 2000 for fundamentals and vocabulary, ISO 9001:2000 for requirements and ISO 9004:2000 for guidelines for performance improvements Myers (2008). Hunt (2009) gives a more practical definition of the standard as a quality management system that organizations implement to provide objective evidence that their business processes meet minimal criteria. It is referred to as a conformance standard, and compliance to the standard is confirmed by an independent third party. From all the above definitions, it is clear that involvement of both management and employees is vital for the standard to work.

2.2 Background (Origins of ISO 9000)

Seddon (1999) claims that originally companies in Britain used to inspect their potential and current suppliers before they allowed them to supply anything. The intention of the inspections was to improve quality of military artillery which was either going off in the

storerooms injuring employees or failing to go off in the battlefield. In 1969 Colonel G W Raby and his committee are said to have recommended that suppliers must take responsibility of their quality assurance and that all work methods must be assessed against generic standards (Seddon 1999). This development opened the door for third part inspection which replaced second part inspection done by government on behalf of the military industry which was the biggest industry then. As a result BS5750 was established in 1979. But in the 1980s people are said to have complained of the visiting assessors who added no value resulting in their titles being changed to auditors who claimed to add some value through advising the suppliers. Seddon (1999) further claims that, this was where the line was crossed through blurring the assessor's role. Assessors originally acted on behalf of the customer but were now becoming advisors to the suppliers they were expected to look out for. The auditor is said to have become both "the poacher and gamekeeper.'' The auditors' success was now being measured by two conflicting measures. Firstly in terms of how many businesses get certified and secondly how many unscrupulous manufacturers get exposed.

By its nature BS5750 is accused of misconception of what quality assurance and improvements means. Documentation of procedures is said to be unable to produce quality improvement on its own but simple repeatability and conformity to a particular standard whether it meets customer needs or not (Pratt 1995).

By the time BS5750 became ISO 9000 in 1987, it is said to have inherited with it all these weaknesses. Previously the auditors, whose role was to relieve the customer of the need to check on suppliers, were paid by the customer not the suppliers (Seddon 1999). The switching of paymasters meant change in loyalty, even though auditors were said to be people of high integrity.

2.3 What is successful ISO 9000 implementation?

Poza et al (2009) claims that successful implementation of the standard is when there is both existence (all required documentation) and functionality (effectively operated QMS that leads to increased customer satisfaction and continuous improvement of business results).
According to some longitudinal study involving 366 companies, successful implementation is when there is sustainable performance improvement through creating, maintaining and improving the system of operating quality management (Cagnazzo et al 2010). The transformation expected from different SMEs may be different due to their existence at different levels of the QMS functionality and existence as shown in Figure 2 below (Poza et al

2009). Again Poza et al (2009) claims that effort needed to get certified will also vary due to similar reasons.

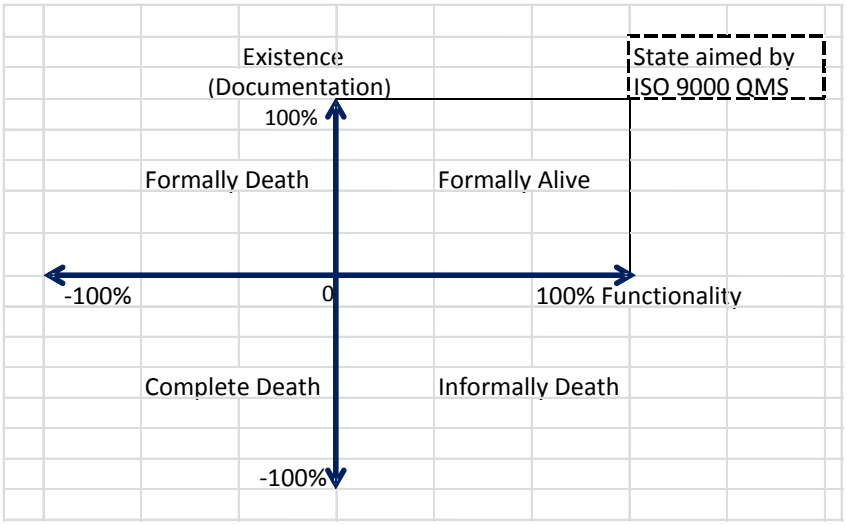


Figure 2: Schematic of Relation between Functionality and Existence of ISO 9000. (Poza et al 2009)

Before implementing ISO 9000, all businesses are said to be existing in any of the four states as explained by Poza et al (2009) below.

i. Complete death: This is when there is no documentation and functionality (processes) to ensure the expected quality of the product is met.

ii. Informally alive: Most SMEs are said to be in this state where there is no documentation but some level of functioning. Under this situation there is a strong reliance on specific skilled individuals to get customer expectations met rather than a system.

iii. Formally dead: SMEs in this category have some level of documentation but no functionality. The documented procedures and processes will be only on paper but not followed on daily activities.

iv. Formally alive: There is both some level of documentation and functionality which could either be required or not required by ISO 9000. These SMEs are, however, said to be the closest to what the standard aims for which is complete functionality and documentation.

2.4 What is failed ISO 9000 implementation?

Failed implementation is when the company stays at or below the formally alive level resulting in no increased and sustainable customer satisfaction and continuous improvement (Poza et al 2009). This is a result of the company either failing to show

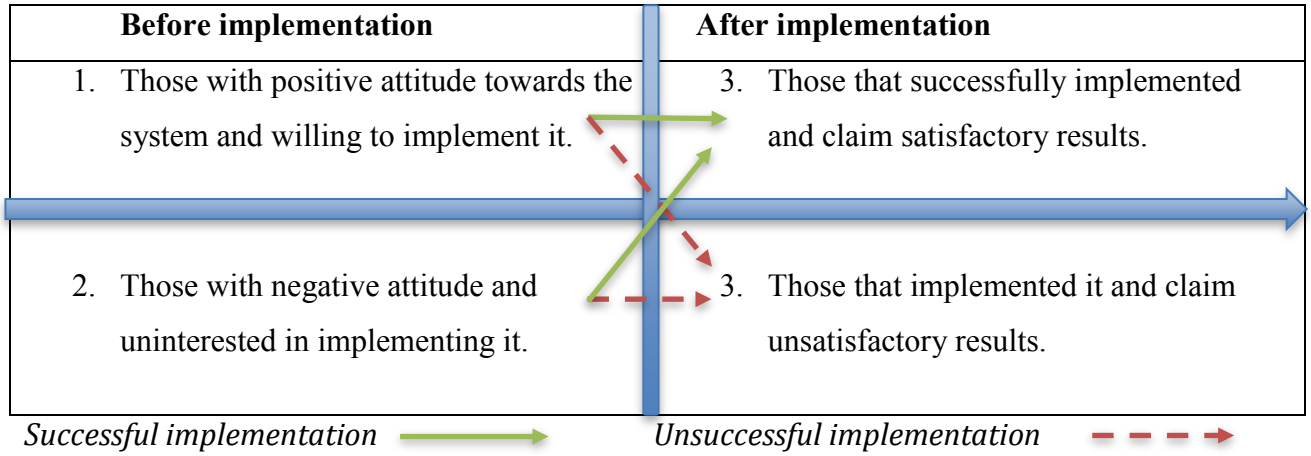
documentation of what it does or failing to prove that what is on documentation is actually what it does (Hunt 2009).

2.5 Attitudes towards ISO 9000

There has been conflicting views on whether ISO 9000 is a helpful tool in improving a business' operations especially SMEs (Psomas et al 2010). Scholars have not come to a clear conclusion on their views in terms of what must be done before, during and after ISO 9000 implementation. Some have developed their attitude towards ISO 9000 based on experience from previous quality improvement interventions they either benefited from or did not (Magd and Curry 2003).

In general, from the literature available, four major categories of SMEs thus emerge. Two of these categories come from before ISO 9000 implementation and two from after implementation as illustrated in Table 1 below.

Table 1: A Summary of SMEs and their Relation to ISO 9000 (Psomas et al 2010)



2.5.1 SMEs that want to implement ISO 9000

Positive testimonies such as the study of 160 Australian companies done by Brown et al (1998) motivate other businesses to want to follow suit. The study found that perceived benefits from implementation of ISO 9000 included improved company-wide quality awareness, product quality, company management, customer relations leading to customer satisfaction and improved organization relations. James (2009) added that being certified can compensate for lost business by enabling SMEs to tender for businesses which require accreditation as a qualification. The South African Bureau of Standards (SABS) claims to have boosted the confidence of business in ISO 9000 by developing a methodology which adds value through a performance based approach to auditing (Muir 2009). Other scholars such

as Myers (2008) see nothing wrong with ISO 9000 since it helps an organization to ensure that its products and services meet or exceed customer needs and expectations.

2.5.2 SMEs that are not interested in ISO 9000

Those SMEs with cynical views about the standard have some fairly justifiable reasons to do so. Lilley (2009) does not strongly believe that the standard is of no value but believes that the standard must help different businesses to reveal and proactively deal with their respective business risks, not to give people an "everybody equal mentality". Frost (2009) admitted that there was general feeling in business that they must go beyond "box ticking" and "certificate on the wall" mentality to providing added value to the clients on performance. Perception that ISO 9000 adds no distinct value has also been blamed on some dishonest and incompetent certification bodies more interested in money than transforming a business (Frost 2009). Lilley (2009) thinks that there are just too many standards to follow with little or no value to add but merely adding to organizational complexity.

2.5.3 SMEs that implemented ISO 9000 and got positive results

Sheriff (2013) asserts that organizations which realized benefits are those that sought certification for operational improvement reasons and not merely to hang certificates on the wall like their peers. Arnold (2012), from his own experience with organizational improvement initiatives claims that these are those that focused more on changing behavior of people on the shop floor who are directly involved with value creation. Koc (2007) claims that, when effectively implemented, ISO 9000 benefits exceed its costs by: improving performance and giving sustainable competitiveness.

2.5.4 SMEs that implemented and claim no positive results

Sheriff (2013) claims that, these SMEs sought accreditation believing it to be a quick fix solution to their problems without a long-term strategy on issues such as improved internal and external communication and plant operation procedures or used wrong implementation procedure. In other words there was no clear metrics combined with actions to continually improve the performance Badner (2006). Seddon (1999) is one of those who lay the blame on the standard in which he claims that, on a number of the cases, they found the standard to be worsening the situation by blinding management from important aspects of business and consuming a lot of resources.

Chow-Chua et al (2003 cited in Psomas et al 2010) blamed ineffectiveness of ISO 9000 on: failure to exercise adequate control over documents, failure to define responsibility and authority for personnel and inadequate training. In one LAN Company, the director admitted to hiding some of the excessive paperwork in the women's toilet, the only place auditors did not get to (Seddon1999). The director complained that too much documentation procedures especially on design revisions made his clients feel that there was little trust of each other every time he requested signed and stamped revised drawings. He claims that he quickly realized that he was now busy working to satisfy the standard's needs at the expense of his customers.

2.6 Pre-existing Human Factors in SMEs before implementation begins

Because of ISO 9000 implementation being a long term quality system initiative, as noted earlier, it would be risky to implement the system without assessing the background against which it will be implemented (Bishop 1998). If this is not done there is danger of worsening or further complicating an already bad situation.

Some factors which were seen to have key influence to the standard's outcome before implementation begins were discussed below.

2.6.1 Impact of implementation procedure

Before anything happens, Besterfield et al (1995) advices that full management support must be acquired. Management's attitude is said to be a true indicator that one can use to predict the success or failure of any implementation project (Pinchot and Pinchot 1993).

Having acquired management commitment, Besterfield et al (1995) says that, the next step is to adopt a project management approach and appoint a management representative who will be the contact person for all key decisions and will lead the team by coordinating various activities involved. According to Vivekanandan (2004), there is no clear description for the best person suitable to be the management representative. This clearly, therefore, means there could be varying implementation outcomes due to difference in management skills from one manager to another.

2.6.2 Management's understanding of ISO 9000

Maxwell (2007) describes what he calls 'the leadership cap syndrome'. He claims that in an organization, there are certain things which no matter how hard people may try to achieve,

they will not achieve beyond what the leaders above them can comprehend or know. Generalized statements of saying "there must be leadership support" do not help much if the leaders themselves struggle to know the exact kind of support expected from them. In Australia, a survey showed that management for Australian SMEs could not corroborate the productivity and organizational benefits they claimed from implementing ISO 9000 (Mo and Chan 1997 cited in Latif and Abdualla 2003). Taiwanese managers are said to have dismissed claims that the standard could boost performance of their firms (Feng, 1998 cited in Latif and Abdualla 2003).

Bishop(1998) claims that management must understand that it takes from two to five years depending on company size for ISO 9000 quality system to sink in after getting certified. Immediately this situation creates problems for SMEs who hire consultants for just the six months implementation period because they cannot afford such overhead costs for a long period to fully inherit and internalize the system. Without understanding this, most management may give their whole–hearted support during implementation and get frustrated soon after with lack of transformation in the organization. Amponsah et al (n.d) concurred with Bishop (1998) claiming that, unsuccessful implementation is usually a result of lack of long-term commitment by top management because of an underestimation of the requirements that include: time, resources, finances and scope. For most SMEs, Neely et al (2000) states that, limited scope of competitiveness by only striving to be the cheapest makes it difficult for them to take advantage of ISO 9000 in terms of, more value addition to enable to them to justify higher prices.

Hoyle (2009) did not lay all blame on management but the misleading critical terms in the standard. The model in Figure 3below, of a process based quality management system used in ISO 9000 is said to mislead on elements which must be integrated for an effective QMS.

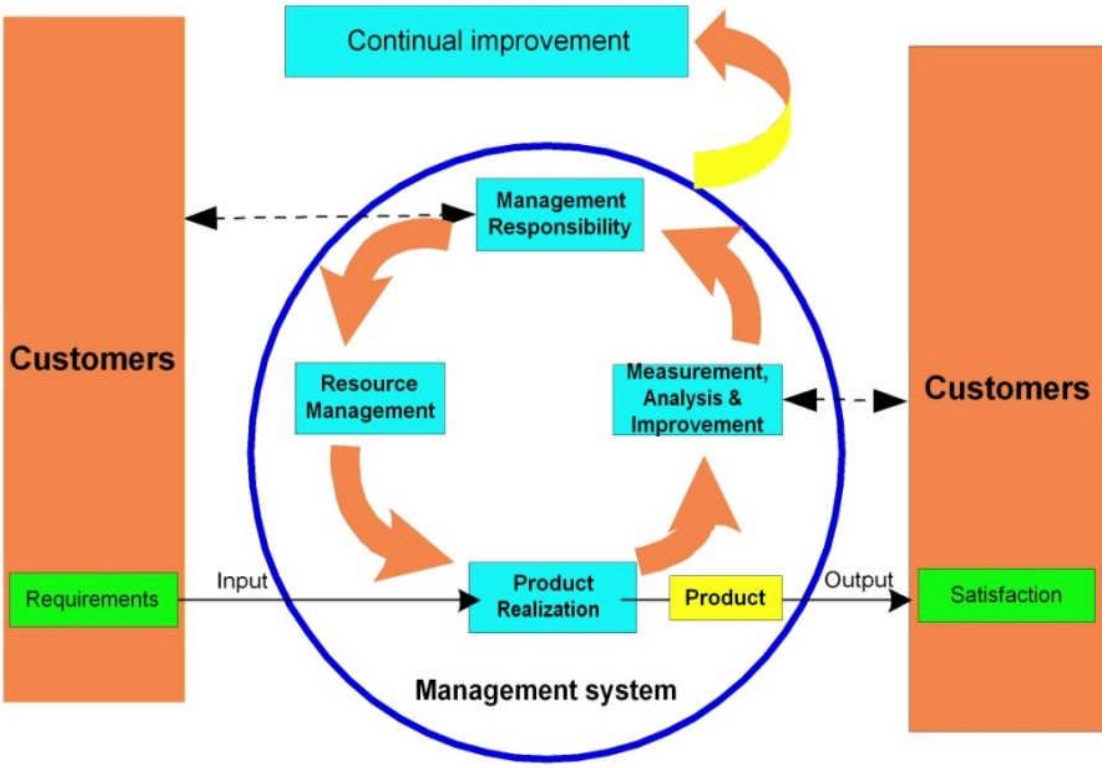


Figure 3: Model of the Process based QMS (Hoyle 2009)

Referring to Figure 3 above, Hoyle (2009, pp 2) claims that, there are differences between systems and processes due to reasons below:

- The elements within the circle imply processes but in fact they are simply the headings of sections; 5: Management responsibility, 6: Resource management, 7: Product realization and 8: Measurement, Analysis and Improvement of the standard. Some of the requirements are deliberately placed in section 8 because the only section where exclusions are permitted is section 7; hence product measurement and nonconformity control, which would be part of product realization, are included in section 8 and not section 7;
- Management responsibility is not a process but a series of obligations;
- Separating measurement, analysis and improvement implies that the output from Product realization is not measured, as product measurement is addressed in section 8 of the standard not section 7;
- The continual improvement element that sits outside the ellipse implies its outside the system when it is already addressed by the measurement analysis and improvement element;
- The diagram omits other stakeholders upon which the delivery of outputs depend such as suppliers, employees and investors;

- There is no indication of the influence of the business environment under which the business will be operating in.

2.6.3 Manager or Leader impact to the standard

According to Charlton (2000) historically, organizations focused on strategy, processes and procedures as primary means of change and sustaining performance. These are only vehicles whose effectiveness depends on the driver that is management. To agree with these issues of misconception, Nieman and Nieuwenhuizen (2010) claimed that the main long term problem with SME owners was failure to distinguish between a business manager and a leader. Nieman and Nieuwenhuizen (2010) argue that SMEs need leaders to grow, not managers to keep them surviving at the same level. Leaders are said to take the business to the next level while managers keep the business in the current "inertia" (Munroe 2012). According to Mahembe (2011), most SMEs are not yet stable in quality systems, measurement systems, effective manpower development and utilization, and product scope; hence they still need visionaries who can see beyond the present paradigm they operate in (Maxwell 2011). Steinhobel (2013) says that, for ISO 9000 to work it needs leadership which can see beyond the paperwork.

Below in Table 2 is a comparison by Corbell (2013) of the difference between a manager and a leader.

Table 2: A Comparison between a Leader and a Manager Attributes (Corbell 2013)

Attributes of a leader:	**Attributes of a manager:**
Studies, and develops ideas and principles	Administrates
Innovates	Accepts the status quo
Resourceful and looks for solutions to problems	Pragmatic in accepting trends and events, but goes no further
Empathetic with a focus on people	Focus is on control, structure and systems
Inspires trust among stakeholders	Has a linear perspective – only follows what's at the end of her/his nose
Understands the big picture	Asks a limited set of questions – just how or when?
Superior listening skills	Acts like a chameleon or imitator of other managers
Courageously challenges the state of affairs, and asks why and what can be improved	Perceives threats
Looks for opportunities to develop strengths	Minimizes weaknesses
Develops a following	Manages subordinates but has few, if any, devotees

According to the current wisdom, managers are principally administrators—they write business plans, set budgets and monitor progress. Leaders on the other hand are said to get organizations and people to change (Maccoby 2000).

As noted earlier, when implementing ISO 9000 in an organization which has no working systems in place, there is a need for a transformative approach to radically change the organization. Even though Bolden (2007) believes that an organization needs managers who can balance management and leadership abilities, some scholars believe that a business that needs radical transformation needs a leader more than a manager. According to Maccoby (2000) management duties can easily be delegated to supervisors and team leaders but leadership cannot. To confirm this, at the GE/Durham plant that assembles engines for the Boeing 777, there are 170 employees lead by team leaders working under one manager, (Fast Company 1999 cited in Maccoby 2000).

2.6.4 Government impact (external environment)

The outcome of ISO 9000 implementation is not completely affected by the people within the company. To motivate SMEs to gain more competitiveness, the Malaysian government reimburses its small enterprises of the ISO 9000 certification costs through the Human Resource Development Fund (HRDF) and the Small and Medium Industries Development Corporation (SMIDEC) (Latif and Abdullah 2003). Up to 50 % of certification costs can be claimed from SMIDEC fund for quality and productivity improvements. This policy encourages SMEs in the positive direction and better prepares them for global competitiveness.

In SA, the government has implemented policies that support engagement of upcoming businesses involving black South Africans to try and correct the inequality issues of apartheid through Broad Based Black Economic Empowerment (BBBEE), (Government Gazette 2004). BBBEE intended to help in making all citizens participate in the country's economic activities, but has little if anything in terms of helping SMEs to be competitive on the global platform. Melusi Gigaba (SA Minister of Public enterprises 2012) admitted that BBBEE was not helping on growth and advocated for some drastic change (Sapa 2012). In its desire to support black owned businesses, the government awards tenders on BBBEE compliance basis without much consideration of availability of capacity to deliver or effective quality management systems. This helps on the social responsibility side but on a long term basis, a problem is created whereby some businesses are tempted to concentrate

more on BBBEE compliance and not operational competence. Director of entrepreneurship at Wits Business School (2012) Chimene Chetty added to this claim, stating that banks were giving money on technical details, without considering creativity resulting in no incentive for continuous improvement (Sapa, 2012). From these current events and thoughts unfolding in SA, there are three situations which arise below:

a) There is little if any grooming of the SMEs to face global competition and protect their market share on technical grounds (Mittelstaedt and Rautenstrauch 2007). This risk stems from the fact that at the end of the supply chain, customers choose what they want on the basis of quality not BBBEE compliance (Bosman andOosthuizen2007).
b) Even if government and financing institutes help SMEs with easy access to capital, still that capital must be put into productive use for real survival and growth of both the SME and financial sector (Olaware and Garwe 2010). This again justifies the need for more diagnosis on internal activities of the SMEs to help them put into effective use any form of assistance they get.
c) Big business, which most SMEs supply, are also under pressure to reduce any risks by eliminating all incapable suppliers who risk their competitiveness in the hostile environments they also operate in (Bosman and Oosthuizen 2007). This means that even if an SME is well rated on the BBBEE score chart, eventually it will lose business if not performing.

2.6.5 Employee perception and results

According to Hellriegel et al (2008), perceptions are influenced by what the people see, the ways they organize these elements in memory, and by the meanings they attach to them. Hellriegel et al (2008), thus advices implementation leaders to first understand pre-existing perceptions about a system for effective and relevant collaboration.

In terms of an organization's transformation to the new system, it is said that for employees, through their direct and vicarious experiences with, form opinions of new systems including ISO 9000 (Latif and Abdullah 2003). This factor effectively influences the organization's absorptive capacity of any new system (Grobler et al 2006). In other words the more positive the perception of the standard by employees, the more ready they will be to implement the system. Latif and Abdullah (2003) agreed and asserted that the cognitive predisposition of individuals towards new systems have a strong bearing on their readiness to adopt and consequently the success of the new system.

As noted earlier, most previous research work has evaluated the impact of ISO 9000 on the shop floor from management's perspective not a holistic perspective. Seddon (1996 cited in Latif and Abdullah 2003) identified examples of negative work related impacts in the same organizations where management was only seeing positive impact. He, thus, raised the issue of understanding impact of the standard at different levels from organizational, work group or team down to individual employee level. Organizational turnaround expert, Arnold (2013) claimed that, no meaningful value addition will happen to any organization from quality or continuous improvement initiative unless positive transformation has happened to the people on the shop floor interacting daily with the product. This view was in agreement with Latif and Abdullah (2003) who claimed that the impact of the standard on the employees' work was expected to color their perceptions about it.

The confusion which SME owners and management experience is when scholars talk of issues without exactly explaining how it will be done. For example Gryna et al (2007) claimed that obtaining enthusiastic commitment from the employees was a critical factor to the success of a new QMS. This does not equip a manager on how to get the commitment from employees without knowing what drives or influences that enthusiasm on a daily basis. Latif and Abdullah (2003) clarified some of the elements involved in the commitment by noting that employees must fully recognize and accept the level of structuring that accompanies ISO 9000. Further, everything being done must be justifiable in simple value creation terms, for employees to keep seeing the benefits rather than mere bureaucratic procedure (Spitzer 2007). Grobler et al (2006), however, hinted that due to most employees being less qualified and experienced on operations concepts, their influence may not be truly productive to generate significant benefits.

2.6.6 Motive for implementation

Veritas Labs' survey of 48 certificated companies in the New York (USA) area found that the primary reason for seeking certification was pressure from existing customers (Piskar2007). A census of accredited firms in Western Australia by Brown et al (1998) also found that pressure from customers was the primary motivation for seeking certification. Each SME's motive of implementing the standard is said to determine its behavior during and after implementation (Poza et al 2009). When customers demand that they want to deal with ISO 9000 certified suppliers, without stating the level of performance to be delivered, it may force some SMEs to just do enough to get the certificate and not go further for the operational transformation which the standard may bring (Psomas et al 2010).

2.6.7 Expected benefits and their influence on ISO 9000 implementation

A research by Casadesus et al (2001) in Spanish industries, found the benefits of implementing ISO 9000 to fall into two groups of: internal and external benefits as explained below.

2.6.7.1 External benefits

The results of this study showed that the external benefits of certification in order of their importance were: better response to customers' requirements, penetration of new markets, improved customer relations, improvement in customer services and reduction of customer audits. Organizations that focused more on external benefits at the expense of internal transformation are said to have implemented the standard only as far as getting the certificate (Steinhobel 2013). Such businesses are reported to eventually fail to use the standard to their advantage in the long run since customers simply need good service whether a company is certified of not (Steinhobel 2013).

2.6.7.2 Internal benefits

Empirical research studies in Spanish industries found that internal benefits from implementing the standard were: improvement of the definition and standardization of work procedures; improvement in the definition of the responsibilities and obligations of the workers; increased company confidence in their quality; greater commitment to work and eventual reduction in quality control costs. It was also found that businesses that sought internal transformation from ISO 9000 diligently implemented the standard going beyond just aiming to impress the auditor. The Veritas Labs' survey found that benefits were obtained in the form of increased employee motivation and personal accountability for job performance (Piskar 2007). However, the four most important benefits experienced for both were improved quality awareness, improved awareness of problems, improved management control and improved customer service.

It can therefore, be safely concluded that the majority of implementations were triggered by the need to reach out to new customers or pressure from the demands of existing customers.

2.6.8 Knowledge gap understanding

The knowledge gap of where the company is and where it must be after implementation is of significant importance (Zack 1999). As shown in Figure 4 below, an organization must not start

implementation without understanding where they are, to enable them to know the amount of transformation needed to achieve their desired new performance level (Zack 1999).

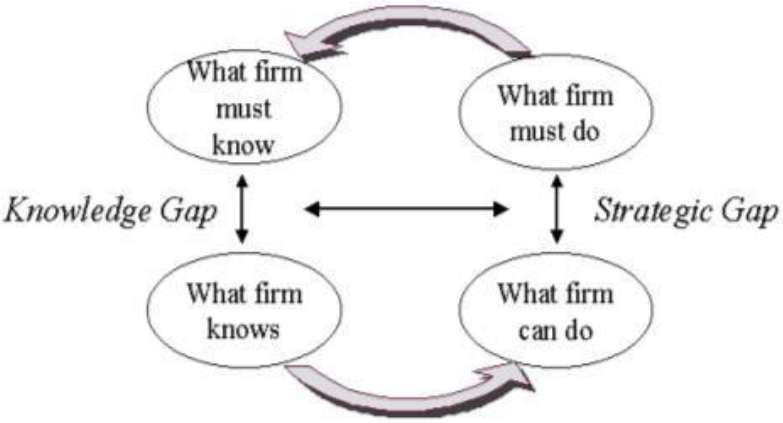


Figure 4: Gap Analysis (Zack 1999)

According to Poza et al (2009), for successful implementation of ISO 9000, there has got to be two critical things considered such as:

- Good understanding of what the standard means. This is because no meaningful gap analysis can be done when the organization only knows where they are without understanding where they should be.
- Capability analysis to check if resources are enough to achieve new desired state and sustain it. Many SMEs are said to have gone as far as getting the certificate but could not go further due to resource constraints.

According to Erasmus et al (2007), when effectively done, a gap analysis can help an organization to understand different business needs as discussed below.

- Macro level needs. Needs which affect all industries in the country or sector such as petrol price or electricity.
- Meso level needs. Organizational needs such as; understanding customer complaints or management of resources which helps the organization to distinguish itself in the market.
- Micro level needs. Two aspects are involved which are:
    i. Operational level needs which involve content of any specific task regardless of who is performing it.
    ii. Individual needs level where for one particular task; different employees performing it may have different training needs.

Erasmus et al (2007) stresses that, it is only after such an approach to evaluation of needs that management can effectively determine training needs as per Nadler's learning model below:

'P – Kd = N', where P is expected performance, Kd is what employees already know and N is training needs.

A gap analysis would not be effective without such a systematic consideration of the variables involved as illustrated by Erasmus et al (2007) above.

2.6.9 Impact of leadership approach

Autocratic organizations which many SME fall under (Günther et al 2011),without a clear chain of command are said to run out of steam when the organization reaches around hundred people or even less (Pinchot and Pinchot 1993). Many entrepreneurs running most SMEs are said to fall into this trap where the leader assumes the role of a "craftsman entrepreneur" with many assistants rather than establishing an effective chain of command through written procedures and empowered subordinates (Pinchot and Pinchot 1993). The challenge for most entrepreneurs after coming up with brilliant ideas was to know when to evolve from being a mere inventor to a business manager (Aardt et al 2000). Even when the business challenges have moved from product development to product quality or marketing, many entrepreneurs seem to remain trapped in product innovation. Pinchot and Pinchot (1993) claims that the result of this situation is the classical growth curve of the craftsman entrepreneur involving rocky start, smooth expansions, rocky leveling from hitting on some ceiling as shown in Figure 5 below.

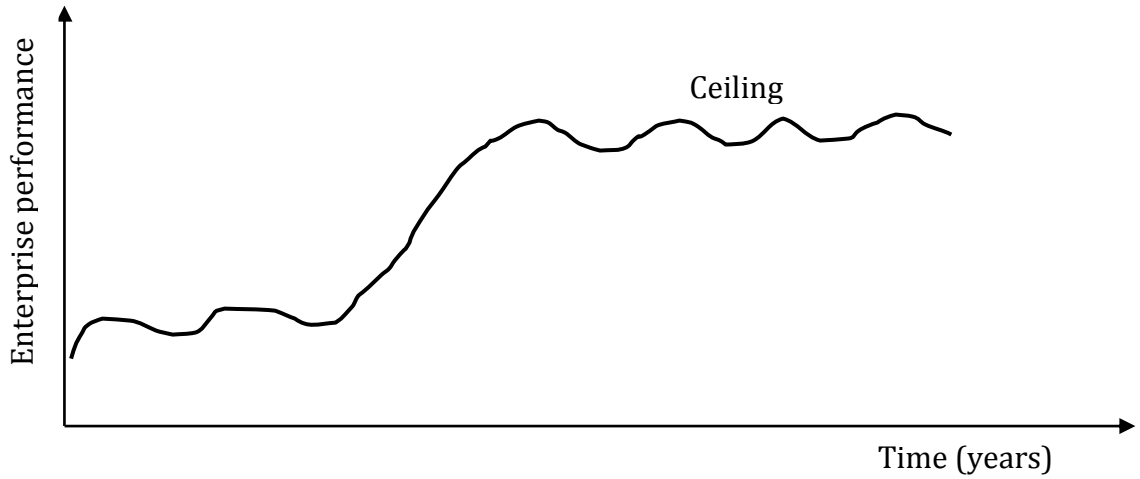


Figure 5: Craftsman Entrepreneur Growth curve (Pinchot and Pinchot 1993)

This was in agreement with Maxwell (2007) cited earlier regarding the leadership cap stifling growth. According to Pinchot and Pinchot (1993), an employee in an autocratic organization is not expected to do what is right or what needs to be done but only to follow orders. However, the backbone of ISO 9000 is established, documented and observed systems which allow people to work independently without relying on some strong

individual (Landerville 2012). Pinchot and Pinchot (1993) blamed some SME owners, who appoint subordinate managers, of continuous countermanding of orders from these managers, again disempowering the managers. In the future, however, it is argued that successful businesses will be the ones more self-driven, than command and control (Koch and Godden 1997).

2.6.10 Change Management to an ISO 9000 Certified SME

The Change Management Consultant group (2012) defined change management as; a method of ongoing business improvement for organizations that affects its people, structure and strategy and results in the firm achieving its objectives. Gryna et al (2007) states that change consists of two parts, the technical and the social effect which comes from the technical change. People are said to resist change as if they are against the technological part of change when the true reason will be the effect to their old social system (Pinchot and Pinchot 1993).

Change can either be planned when an organization has a strategic reason to implement it or unplanned when an organization is simply reacting to circumstances it finds itself in (Abdul 2012). Many scholars have done research work on barriers to change but have simply put everything in one group. There was no consideration of change from a systems and subsystems perspective which is a reality of any business (Hoyle 2009). Abdul (2012) found that resistance to change happens at individual, group, departmental and organizational level with its complexity directly related to organization size. For successful change management leadership must understand this.

An IBM study showed that most CEOs considered themselves and their organizations largely ineffective at bringing about change (Rick 2010). According to Rick (2010), change practitioners reported that, success rates in terms of meeting project objectives were: 41% – fully met objectives; 44% – missed at least one objective and 15% – Missed all objectives or aborted

2.6.10.1 Key barriers to successful change

According to Rick (2010), in a research done by IBM it was revealed that key barriers below from employees and management have a significant correlation to successful change implementation:

- Changing mindsets and attitudes.
- Corporate culture.

- Complexity is underestimated.
- Shortage of resources resulting in strenuous working conditions.
- Lack of commitment of higher management.
- Lack of change know how.
- Lack of transparency because of missing or wrong information.
- Change may create the necessity for new skills and this usually causes discomfort to people who had been masters of the old system especially older employees.
- Emotional connections to the old ways. Some people would have participated in establishing the old ways being phased out and they feel their achievements are being wiped off.
- Belief that it's a temporal fad. This happens especially in environment where leadership constantly makes abrupt changes without follow through.
- Exhaustion and saturation when the employees are not happy with the changes but feel they cannot stop it so they just go along passively.

It is clear from above that getting the "soft" stuff right turns out harder to do than getting the traditional "hard" stuff, such as resources and technology, correctly aligned. According to Rick (2010), what was once considered the unimportant "soft and fuzzy" aspect of organizational life turns out to be what makes or breaks change projects.

2.6.10.2 Key ingredients for successful change

The Change Management Consulting group (2012) claims that there are three elements which must be present for any change program to be successful;

i) If people are not considered, the change initiative may successfully set up its structure but it will soon breakdown.

ii) When there is no structure, people will have to make extra efforts to deliver minimum results.

iii) When there is no strategy, conflict of interests may occur and tactical activities are disconnected to achieve a unified purpose.

Abdul (2012) found that resistance to change can be effectively tackled by management having an anticipative attitude on how people will respond at: individual, group, and departmental level as explained below.

Individual level

- Direct involvement will bring a sense of ownership and identification with what the change intends to bring. This is one of the areas where level of consultant involvement must be monitored to avoid taking away the project from the people.
- Monetary incentives, even though this only brings short term motivation but no sense of ownership.

Group level

- Using change agents (pioneers of change) who understand the expected challenges and benefits to market the change to their peers.
- Creating an environment free enough for people to raise their differences if not happy with proceedings.

Leadership level

- Honest and timely communication.
- Clearly defining the goals. Visionary leaders, no matter how articulate, are not enough. Shared commitment still requires personal contact to make it real.

Leaders must get the leadership skills they lack and not over-rely on what they are good at as. It was for similar reasons that Mahatma Gandhi said, “We must become the change we want to see” (Ashoka 2012). According to Maslow's hierarchy of needs, people need to feel secure at individual level before committing themselves to anything beyond themselves (Huitt 2007). Further, Abdul (2012)claims that people perform better when emotionally engaged and to engage people emotionally, organizations are advised to move away from old dictatorial management systems which; treated people like children and expected them to behave like adults.

Corporate level

- Corporate culture that motivates and promotes change. To promote the culture of accountability leaders must remove the blaming culture especially on no-conformances.
- Efficient training programs relevant to what people do.
- Adjustment of performance measures to avoid judging and discouraging people.
- Efficient organization structure which constantly adapts to change.

The Change Management Consulting group (2012) claims that even when all the above key ingredients are there, some level of resistance will take place naturally because people have to break inertia to move to the new system. Good anticipation of how people react to change,

as shown in Figure 6 below, helps management from panicking when it seems as if the project is not taking off or standards are further deteriorating (Rick 2010).

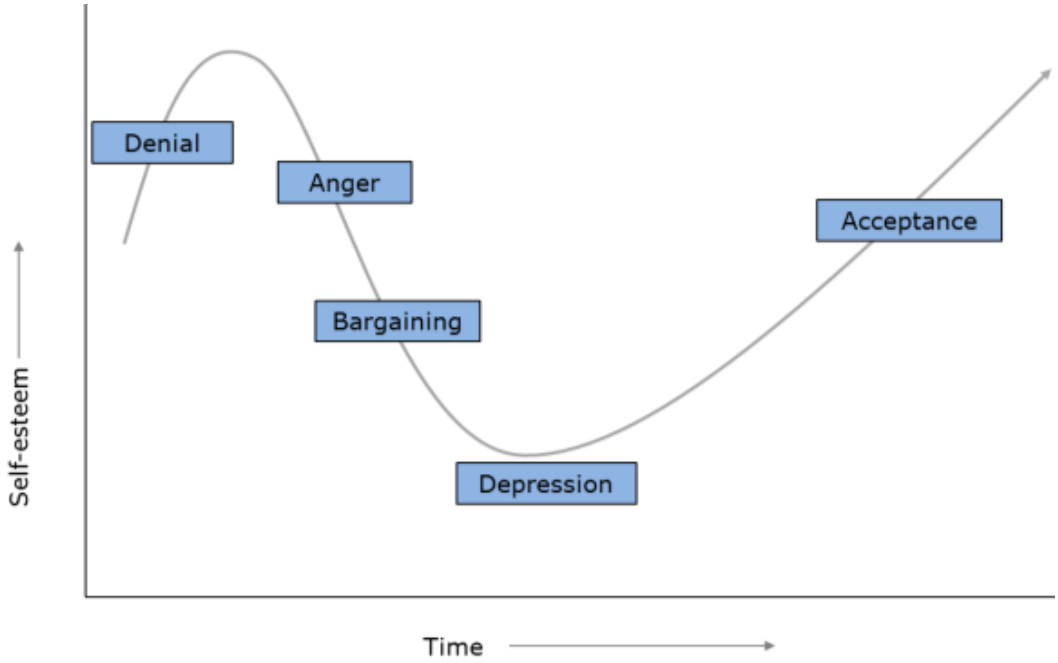


Figure 6: Classical Psychological Reactions to Change (Change Management Consulting Group 2012)

Leadership is expected to understand the various stages above which people go through and offer relevant support at each stage.

2.6.11 Transformation strategy

Kurt Lewin's proposed a universally accepted three-phase change management model which gives concepts of a straight-forward change management process as shown below in Figure 7 (Kritsonis 2005).



Figure 7: Organizational Transformation Model (Kritsonis 2005)

In this model, management is advised not rush to implement any new system before unfreezing the old culture or any elements which will undermine the new order. While dismantling the old system new standards and behavior must be taught to everyone and support provided for people to get used to the new system. As the people get familiarized with the new system, management can freeze this new order and make it permanent to avoid retreating to old ways (Kritsonis 2005).The model was in line with claims by Zack

(1999), that for effective transformation, people must understand the current system before dismantling it to avoid the old elements to interfering with the new order.

2.6.12 Interpersonal relationships

According to recent studies with various South African companies, the trust gap between employees and employers is widening (Grobler et al 2006). Below is an extract from Pinchot and Pinchot (1993 pp 70, 230, 256), on how organizations with rigid bureaucratic systems spoil relationships within the organization which in turn thwarts expected benefits from systems such as ISO 9000 even if they may be good QMSs.

"The quality of relationships a company has with its customers may be the primary competitive advantage available in most industries. The way employees respond to customer needs is a mirror of how the employees are treated in the organization. Thus the relationships between members of an organization is a strategic issue that determines the very fabric of the organization…In a bureaucracy, the pattern of relationships between people is defined as who is dominant over whom… Dominance and submission bring out the worst in people. The quality of relationship in a formal hierarchy is limited by fear, flattery and power politics... No one wants to tell the bosses the truth that the project he or she once begged them to back is no longer any good. In complex projects many small untruths and withheld truths add up to major delays and cost overruns or even disasters. However, truths are easier to face up to and voice in a climate of openness and trust. The more equal the relationship, the more possible it is for truth to flow."

Further, Pinchot and Pinchot(1993) added that, when employees are disempowered and merely function in their roles as mindless machines, relations are mainly from role to role discouraging person to person relating which is a key stimulant to creativity. In a way, Hellriegel (2008) agreed claiming that, no matter the leadership or management style applied by leadership, its success still depends on employees' willingness and creativity.

2.6.13 The SA context and employee empowerment

According to Pinchot and Pinchot (1993), coordination from above worked well during the industrial revolution when huge numbers of employees unskilled in the mechanical arts had to be quickly fitted to a job in the "satanic mills." Employees were said to need simple and clear assignments due to rapid employee turnovers resulting in companies such as Ford Motor Company recruiting fifty four thousand workers to be able to retain only thirteen thousand **(**Pinchot and Pinchot 1993).

In the modern USA, however, which is one of the countries with most skilled people; there is now an increase in number of skilled and qualified people capable to apply their knowledge independently with minimum instruction (Drucker 1999). The challenge in SA is that there seems to be a temptation to literally "cut and paste" what is successfully working in the USA or other developed countries without considering differences such as literacy levels of the South African workforce, level of unionization which has an impact on employee competence and attitude (Nieman and Nieuwenhuisen 2010). In South Africa, approximately 27% of the economically active population is illiterate, that is, they have grade 5 or lower educational qualification (Erasmus et al 2007).

The situation described above by Pinchot and Pinchot (1993), Drucker (1999) and Erasmus et al (2007) was illustrated below in Figure8 by Charlton (2000). It appears that a fair amount of South African youths are still in the unconscious incompetence range where they are not even aware of their lack of competence skills while for the developed world, most youth will be in the conscious competence zone where they still need coaching but can work productively.

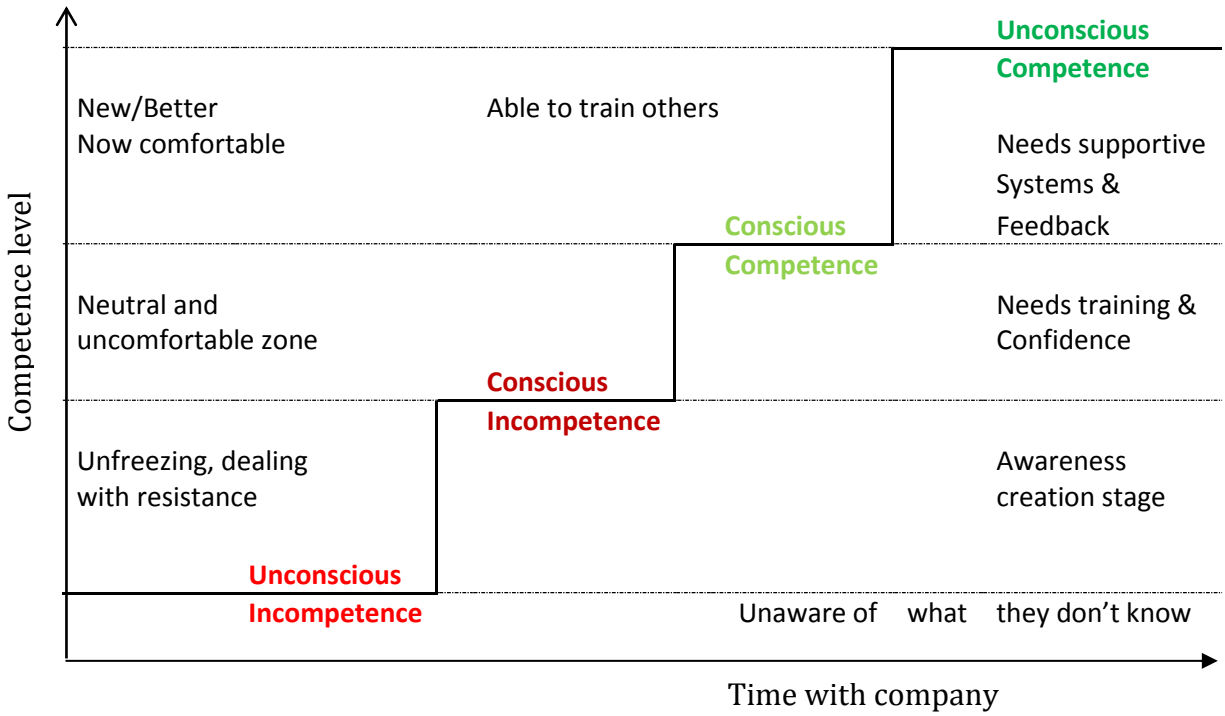


Figure 8: Employee Competence Levels (Charlton 2000)

The dilemma for many SME managers is, how much of the freedom to work independently do employees deserve since they have limited formal education to add to on-the –job training compared with the western and recently some eastern countries were most of these theories were tested and worked (Lange et al 2000).Pinchot and Pinchot (1993) emphasized

that, for freedom to work it requires informed people. In other words, intellect functions effectively when equipped with good information to work with. Pinchot and Pinchot (1993, pp 100) went on to highlight the importance of education, claiming that, "the more broadly educated the people in an organization are, the more kinds of truths they can share. If everyone can read it is easy to share general information but if everyone can understand numbers, it is easy to do statistical process control involving everyone."

Further, Drucker (1999), commenting on Taylor's approach and increase in number of knowledge workers in USA said, it is still going to work for countries with a lot of manual work, that is the 'Third World' countries with very large and still growing numbers of young people with little education and skill. Drucker (1999) maintains that in developed countries, the challenge is no longer to make manual work productive since that has been mastered, but to make knowledge workers productive. For SA, care must therefore be taken to avoid "cutting and pasting" of labor solutions which worked in developed countries when there is such notable differences in literacy of the respective workers.

2.6.14 The ideal organization for ISO 9000 to be effective

According to Pinchot and Pinchot (1993), the newly emerging forms of organization will depend more on result focused teams, shared vision and individual choice rather than hierarchy and rules. This is similar to the issue of documented procedure advocated for by ISO 9000 which focuses on the intra and inter-departmental interaction not hierarchy of command down departmental silos (Myers 2008). When the above transformation has been achieved, individuals within teams are said to become engaged on their job functions which helps in creating learning goals (Armstrong 2012).

If team learning above starts taking place, Senge (1994) believes the bridge to organization learning would have been created which is one of the key ingredients to continuous improvement. In many bureaucracies, however, the customer is a distant distraction; people seek the regard of their boss rather than satisfy the recipients of their work (Pinchot and Pinchot 1993). When management fails to transform itself to deal with the above and continue treating people as another factor of production, organizational citizenship is said to drop with people just doing enough to avoid punishment (Pinchot and Pinchot 1993).

In terms of time management, more than half of most organizations' time is said to be wasted on politics, paperwork, looking for misplaced things, and unnecessarily long meetings (Pinchot and Pinchot 1993).Many leaders despite their many years of experience are

said to have not experienced the real power of transformative measurement, but many years of mundane routine measurement leading to low impact, which further leads to more mundane measurement and so on (Spitzer 2007). Armstrong (2012) added to the issue of measurement claiming that, performance management systems only work if managers want them to work and are capable of making them work. The challenge with meaningless measurement is that only when people start looking at the same thing differently can change take place (Spitzer 2007). However, the bigger the organization is the more difficult it is to break inertia.

2.6.15 Employee engagement.

According to Carnegie Institute (2012), just as knowing customer satisfaction is a half done job to understand the customer so is employee satisfaction. In the 1980s,it was found that companies that used the most progressive and participative human resource practices significantly outperformed companies that did not (Charlton 2000). Employee satisfaction assessments do not truly show the underlying emotions as employee engagement does. The Gallup's research found that in most organizations 19% of employees were "actively disengaged", 55% were "not engaged" and only 26% were actively "engaged" (Spitzer 2007).

Engagement should not only deal with management-to-employee dimension but also employee-to-employee dimension especially through a flat, team based organization structure which allow employees to learn from each other (Hellriegel 2008). To achieve this, broader consideration for organizational readiness must also be done which involves: first fixing as much as possible current flaws before bringing a new system, assess leadership, people readiness and capability (Gryna et al 2007).

Drucker (1999) claims that if this is to be successful, management is advised to shift their attitude from viewing their workers, especially knowledge workers, as a cost, to treating them as company assets simply because costs must be controlled and managed while assets must be improved and utilized.

2.6.16 Organizational Intelligence

In his research, Goleman is said to have found that effective leaders are alike in one crucial way of a high degree of EQ which increasingly get more important than technical skills difference as one goes up the corporate ladder (Armstrong 2012). Management expert John Grumbar (Spitzer 2007) says key determinant for managerial failure was EQ. Grumbar,

further claims that most people are hired on IQ but fired on EQ. Therefore, this means that even with the right qualifications and management tools such as ISO 9000, management can still be ineffective.

According to Armstrong (2012), five components regarded as a must have for each individual to help create an intelligent organization were found to be: self-awareness, self-regulation, motivation, empathy and social skills. When hiring especially for management are hired basing on IQ, there is temptation to over rely on IQ subsequently neglecting EQ, which is vital for social connections and team building(Spitzer 2007).

2.6.17 Customer understanding

Customer satisfaction surveys that ISO 9000 recommends can mislead businesses since they are too general and rate meeting of minimum expectations of the customer as good performance. Organizations are beginning to realize that providing a good product or service is only the "tip of the iceberg." Spitzer (2007) claims that, customer experience is more than the core transaction but what precedes before and follows after. A Bain and Company study revealed that companies misread their customers' perceptions. Of the 320 firms surveyed, 80% believed they deliver superior experience to their customers but the customers only rated 8% as delivering superior experience (Spitzer 2007). Transactions are easy to measure but experience is not. This is because customer service is what is given to the customer by a business while experience is what the customer gets (Dwyer and Tanner 2008).

One challenge which most businesses experience is with their limited definition of what quality is. Many businesses are said to focus on the tangible part of quality such as durability and performance of the product (Besterfield et al 1995). Besterfield et al (1995) also speaks of nine dimensions of quality which are performance, features, conformance; reliability; service; response durability, aesthetics and reputation. The mandate of the QC department will be therefore of no value if they only focus on physical attributes of the standard.

There is, therefore, a need for an effective feedback loop to help employees understand how they are doing and how they must improve (Gyna et al 2007). Gryna et al (2007) added that a number of customers who claim to be satisfied during customer surveys done through initiatives such as ISO 9000 were not necessarily loyal. Wrong human behaviors may get cemented when management thinks that they are effectively meeting customer needs while the customers are busy trying to switch to other suppliers. The risk is worse for standard products which can be easily made by competitors making it easy for customers to switch to

other suppliers (Kruger 2008). Because of this, many organizations are said to get shocked when suddenly they must make drastic changes after losing the "satisfied" customer due to poor customer understanding (Nieman and Nieuwenhuizen 2010). The Gallup's researchers claim that every time a company makes a transaction it is either building or destroying customer loyalty (Spitzer 2007). To stress on importance of loyal customers, Dwyer and Tanner (2008), claim that loyal customers are more profitable due to costs being amortized, referrals, recommendations and less need for discounts to attract them. As the cost of getting new customers goes up, the value of retaining and expanding existing customer relationships increases. According to Creelman (2010) all employees must therefore individually understand how they contribute to customer loyalty.

2.7 Factors that affect SMEs during implementation

Factors thought to impact on the standard during implementation were discussed below.

2.7.1 Deployment of Goals

Having determined the company's vision and quality policy, the SME leadership must still strategically communicate this down the organization ranks to every employee in the organization. According to Armstrong (2012), the best way to see if effective communication has taken place is when everyone in now aware of; what they have to achieve, skills and knowledge they need to achieve their tasks. Gryna, et al (2007) states that the key point to know is that vision, strategies and goals merely provide direction, but specific actions and tasks must be fulfilled to achieve the bigger picture.

Once the goals have been deployed into sub-goals to different organization departments, key measurements must be established relevant to the respective departments (Gryna et al 2007). According to Hunt (2009) many organizations are challenged to meet the requirements of Clause 6.2.2 for: Competence, Awareness, and Training. Deployment of quality goals can yield more rewards when management understands different requirements for people with different responsibilities.

2.7.2 Why a team of smart people can be ineffective during implementation?

Unfortunately ISO 9000 does not say much on team dynamics even though this influences organization performance. Organizational psychologist Argyris (1991 cited in Spitzer 2007), claims that, even when people try well to engage in learning, there are individuals and organizational learning disabilities that not only prevent optimal learning but effective

performance. When smart people with learning disabilities due to poor communication skills come together, reverse synergy is said to occur (Nieuwenhuizen and Rossouw 2008). A lot of authors and consultants on operations improvement talk of team building as simply bringing different people together with one objective without considering such dynamics. In building teams for continuous improvement, leaders must know such challenges involved in team building. Organizational learning expert, Senge (1994) claims that, this was the reason why a team of committed managers, both with Intelligence Quotient (IQ) above 120 can have a collective IQ of 63.

Author of "The Talent Myth", Gladwell (2002 cited in Maxwell 2011) claims that many companies and consulting firms put finding people with talent ahead of everything else. He claims that certain companies hire dozens of MBAs from top universities, quickly promote them, reward them lavishly, and never accurately assess their performance. Drucker (n.d pp 1 cited in Maxwell 2011) states that, "there seems to be little correlation between a man's effectiveness and his intelligence, his imagination, or his knowledge…These resources are important but by themselves they only set limits to what can be contained."

For SME owners without above knowledge, there is therefore risk of hiring people with matching certificates to the job but lacking relevant competence. It can therefore be safely concluded from Drucker (n.d)'s arguments above, that, for many QMS interventions where people blamed the standards for being ineffective, it could be the people who failed to adapt.

2.7.3 Increased workload on employees

Due to lack of capital to hire extra workforce and justify it with the size of the company, employees who at times are already loaded with their daily work are given responsibilities of ISO 9000 as extra workload (Abdullah et al 2012). This results in the standard not being whole heartedly implemented and maintained. Real transformation at times will not take place since most activities will be mere routine just to get to the audit.

2.7.4 Creating a free and friendly environment

This is an environment where people will be free with each other due to the trust and confidence existing in each other (Mossman 2013). Below are the positive elements observed by Pinchot and Pinchot (1993) basing on the fact that an important quality attribute of an organization is its ability to self-correct:

- Admitting problems and seeking help.
- Being free to express negative feelings. (As it is said "you can't really mean yes unless you can also say no").
- Being direct and straight forward about personal relationships, inviting critique and feedback.
- Asking for and giving support.
- Feeling free to offer ideas and suggestions.

In a favorable environment such as above, corporate entrepreneurship which equips an SME to deal with its dynamic business environment is attainable through enhanced effectiveness in every activity (Nieuwenhuizen and Rossouw 2008).

2.7.5 Building effective teams

According to Spitzer (2007), an organization can only be; smart, well informed and wise to the degree its people are wise and interconnected. However as noted above, it is not enough to expect an effective team to emerge by simply bringing the best people together. Systems thinking claims that, the whole is different from the sum of the parts (Hoyle 2009). According to Hoyle (2009) systems take on "emergent properties" of their own that do not seem to resemble parts they are driven from.

In a disjointed organization there is no collective effort, people often dissipates each other's effort due to poor integration (Pinchot and Pinchot 1993). According to Fracaro (2007) a lot of SME owners have a problem of too much micro-management where they assign managers or team leaders tasks and keep on dictating instructions resulting in the business' survival to keep revolving around one person. Systems thinking, however, is said to focus on the relationship among parts rather than characteristics of each part (Hoyle 2009). Because of this, team members must be brought together in a way that allows them to relate to each other through their duties (Armstrong 2012). To support the idea for teamwork, Pinchot and Pinchot (1993), stated that, when people are given an opportunity to participate in design, and decision making process, they discover in themselves high levels of responsibility and effectiveness.

2.7.6 Performance measurement systems

According to Reichheld director emeritus for Bain and Company and customer loyalty expert, measurement systems create the basis for effective management (Spitzer 2007). Reichheld blamed most companies for paying results that were easy to measure rather than

the right results. Spitzer (2007) agreed with Reichheld on what he called passive resistance or malicious compliance where employees meet the letter of a law, but violet its spirit through just doing enough to stay away from punishment. Gerstner (2002) emphasized importance of implementing performance measurement systems saying that people do not do what is expected but what is inspected. Jeston and Nelis (2007), however, warned that before any new strategy is implemented it is important to assess capacity of the organization or a department to see if there is enough staff with relevant skills to sustain it.

2.7.7 Technology integration

During implementation of the new system, a balance must be maintained between the people and technology (Kruger et al 2007). The challenge comes in making employees to constantly upgrade their skills to match the rate at which technology will be advancing. When technology moves far ahead of employees' abilities, it becomes tied up capital which may take years to recover, if its lagging behind it becomes a source of discouragement (Kruger et al 2007). Even though Erasmus et al (2007) advises SMEs to continuously implement the latest technology if they are to gain competitiveness, former Marshall Industries CEO, Rodin disagreed saying people should not expect technology to fix the flaws in their systems (Spitzer 2007). In other words, it means that if you automate a broken process, you get automated broken results. The challenge however, on integrity of some tasks such as manually generated Non Conformance Reports (NCRs), was that people could manage them as they prefer. With computerized systems, this can be linked to senior leadership forcing people to attend to outstanding issues. According to Hunt (2009), the biggest problem with most technology was lack of humanization of the system which caused people to disregard it.

2.8 Factors that affect SMEs after implementation

Even after successfully attaining certification, an SME can fail to gain much from the standard through not knowing what to do after (Fracaro 2007). ISO 9000 auditor for TÜV Rheinland South Africa, Steinhobel (2013) claims that, when they visit some organizations for the next audit, they usually find them still at the same level or even backslidden. The auditor attributed this to businesses only working towards audit requirements instead of real transformation on the shop floor. Abdullah et al (2012) claims that Malaysian government departments during implementation, were constantly stunt by change in leadership, lack of a standing quality department and continuous revision of the standard versions. Even though most SMEs are not similar to public enterprises they relate with this

scenario in terms of not having a clear quality department and continuous change in management. This situation confuses especially the employees by frequently adjusting to new leadership styles. Amponsah et al (n.d) blamed the culture of overemphasis on attaining certificates without focusing on a system to continuously improve operations.

Arnold (2013) stressed earlier that focus should continue being on the positive change that happens on the company's daily activities after implementation not on impressing the auditors during the audit.

Some of the elements which impact on ISO 9000 implementation outcome during implementation were discussed below.

2.8.1 Delegation, Empowerment and Accountability

As an SME grows, the supervisors and middle managers must get relevant empowerment to make decisions and implement procedures at their levels (Pinchot and Pinchot 1993). It is however said that in about a third of organizations, top leadership does not know how to clearly define its vision to juniors for effective alignment of their activities (Jeston and Nelis 2007). When properly done delegating power is believed to increase the organization's thinking power since more brains will be now empowered to think and take action (Pinchot and Pinchot 1993). Empowerment should not be a simple matter of subdividing an organization into little monarchies. According to Nieman and Nieuwenhuizen (2010) highly successful entrepreneurs know their strength and weakness and use others to help them on their weak areas. This means when leadership is delegating power in the organization, they should do it to complement each other's weak areas.

To put an employee in charge when not empowered is, however, futile. For effective quality planning, Gryna et al (2007, pp 174) states that, "ideally quality planning for any task should put the employee into a state of self-control." When work is organized so that a person has full mastery over the attainment of planned results, that person is in a state of self-control and therefore can be held responsible for the results. Gryna et al (2007) further claims that to be in that state of self-control where people cannot refuse accountability, they must be provided with:

- Knowledge of what they are supposed to do such as dimensions of the product and acceptable tolerances.
- Knowledge of their performance to enable them constant self-evaluation.

- Means to evaluate and regulate performance if the process is failing to meet goals.

2.8.2 Leadership role to employee motivation.

Hellriegel et al (2008) argues that, one challenge with employee motivation is that most scholars have taken a "one size fits all" approach neglecting the fact that within the same group, different employees are likely to be at different levels of readiness. According to Charlton (2000) future competitive advantage is dependent on the quality of human competence and the way people are led. On his fourteen points of quality improvement, quality guru, Edward Deming claimed that it is the responsibility of management to discover barriers that prevent workers from taking pride in what they do due to factors such as emphasis on numbers and not quality, turning out the product quickly rather than properly; a deaf ear to suggestions; spending too much time on reworks; poor tools and poor incoming material (Walton 1991). Deming blamed this situation on hiring of supervisors from universities without technical knowledge of the job they supervise. Previously as he claimed supervisors came from the shop floor through promotion. However, promotion of best employees from the shop floor had a problem in that the higher a person went on the corporate ladder, the less skills they needed from the previous job (Westhuizen and Wessels 2014).

Deming had a problem with the university supervisors because they focused more on numbers such as daily targets, machine downtime, rejects rate and information technology (IT) systems without a clue about the context under which the numbers were generated (Walton 1991). In 1964, Norbert Wiener the mathematician behind cybernetics claimed that, the future offers little hope for those who expert that the new mechanical slaves (machines and IT) will offer a world in which we may rest from thinking (Pinchot and Pinchot 1993). Wiener added that, "the world of the future will be an ever more demanding struggle against the limitations of our intelligence, not a comfortable hammock in which we lie down to be waited upon by our robot slaves…(pp 273)."

Since supervisors are a key source of information for employee appraisal, when they do it with limited knowledge, it may do the opposite and demotivate employees (Grobler et al 2006). An example is when there are production rejects and the supervisor cannot identify if the source of non-conformance is an old machine, poorly serviced tools, skills and qualification level of the employee or relative complexity of the products different employees will be making (Gyana et al 2007).

Misapplied performance targets are said to destroy teamwork and promote selfish individuals. According to Visser (2012) daily targets may force senior employees to fight for their high targets neglecting to mentor the inexperienced junior employees. Visser (2012) again claimed that employees develop lack of interest to work on new products which could mean future survival of the company since they would fear to jeopardize their reputation due to poor quality products.

2.8.3 Ability to learn and adapt to change

According to Pinchot and Pinchot (1993), individual learning improves individual capacity; organizational learning enhances organization systems and capacity for performance through empowering people to do the job better by not just teaching them to do it better within the same inhibitive environment.

One advantage of network organizations over chain-of-command organizations is their ability to learn (Grobler et al 2006). Davenport (1993) claims that, firms and organizations are usually structured in a way that works against the success of their new process designs. Bureaucracies tend to lack systematic integration of activities resulting in demanding information that is not used; withholding other vital information; and forcing meetings, memos, and reports on people who do not need them (Pinchot and Pinchot 1993). Pinchot and Pinchot (1993, pp 277) argues that, "because thinking and doing are separated in a bureaucracy…," due to treating shop floor employees as mere machines, "the 'thinking' part is often unaware of what the doing part has observed." Even though office and shop floor people must be in constant interaction for continuous improvement, for sustaining the improvements, effective standardization of procedures as illustrated in Figure 9 below on the Deming cycle is needed (Vietze 2013).

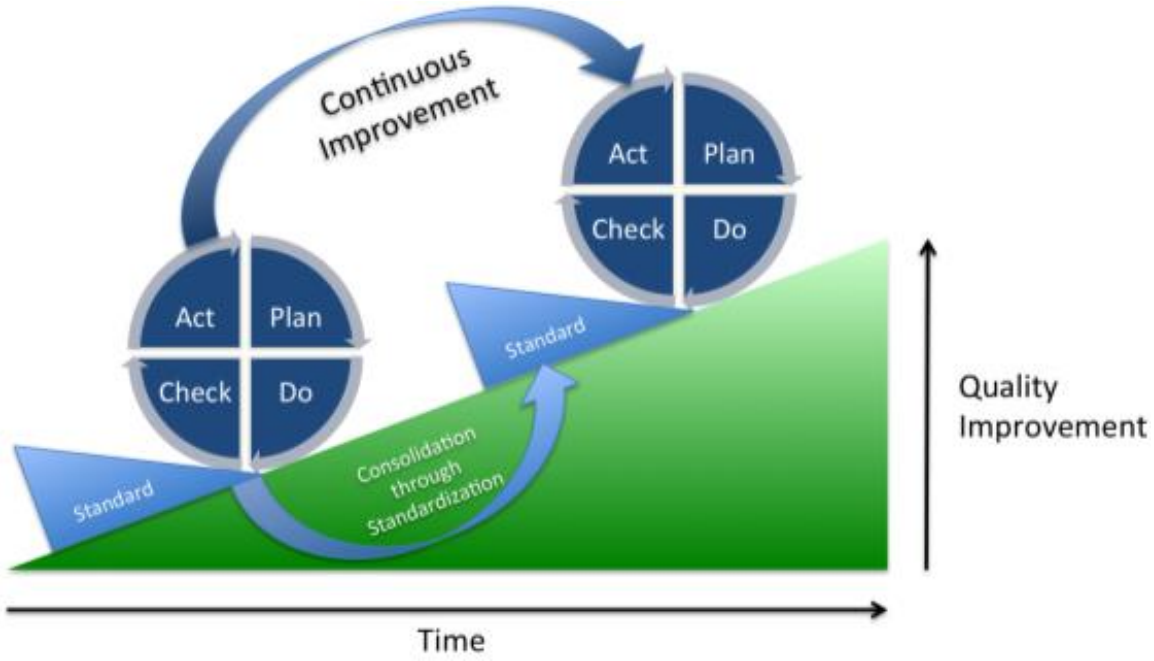


Figure 9: Deming Circle (Vietze 2013)

Duggan (2012) claims that, transformation is not enough until people know the direction the company must head in or else the company keeps on drifting in many directions. In designing for operational excellence, Duggan (2012) encourages that management must make each and every employee see the flow of value they create down to the customer and fix it before it breaks down.

2.8.4 Measurement systems and employee behavior

Spitzer (2007, pp 15) claims that, "in most organizations there is frenetic behavior, lots of activity, but little really being done and no one seems to know what is paying off and what is not." In support of this view, Goldratt (1991cited in Spitzer 2007), claims that all behavior in an organization can be predicted by what is being measured.

Below are some of the major performance measurement functions according to Spitzer:

- Increases performance visibility since most key performance indicators such as process, capabilities throughput are not easily visible.
- Focuses attention to valued activities from so many things people are expected to do in limited time.
- Leadership expectations are clarified.
- Accountability is enabled.
- Increase in objectivity through replacing subjective opinions with hard facts.
- Makes it easy for leadership to give meaningful feedback.
- Increases behavior alignment.

- Provides early warning signs.
- Enhances understanding through providing a common platform.

For South African SMEs however, the challenges range from the owner not having enough skills to design and implement suitable measurement systems down to employees not being skilled enough to operate the system even if it is the appropriate one (Nieman and Nieuwenhuizen 2010).

2.8.5 Wrong measurement systems impact

Dysfunctional measurement is said to occur when the measurement process itself contributes to unexpected behavior in the company (Grobler et al 206). The temptation according to Spitzer (2007), comes from the fact that easy of measurement and triviality are highly correlated; resulting in it being frequently used to: control, justify, audit and determine who went wrong, rather than what went wrong. Artkinson (1999) claims that it is of no use for management focuses on numbers of final output, calling it quality monitoring when it actually contributes nothing to product quality. Spitzer (2007) added that when rewards are at the end of the measurement process, it becomes the end not the means to an end. Under such circumstances 'best employees' are usually the ones good at putting their best foot forward during performance appraisal or when being monitored. According to Grobler et al (2006) effectively designed measurement systems must evaluate performance not just to pick up wrongs but for development purposes.

Evaluation without good data leads to subjective judgment. Drucker (1999) gave an illustration of what happened in the 20th century where good managers were measured by their utilization of manual labor but now in the 21st century, the biggest challenge for management is productivity of knowledge workers. This means that, there can be organizations effectively managing shop floor people but results not showing due to the missing link of not looking into blue collar workers such as planners, supervisors, engineers and other office people. Why? Because the purpose of measurement should be to provide real understanding, helpful feedback, and to foster learning and improvement to all people involved (Grobler et al 2006).

2.8.6 Creating a positive context for effective measurement

Management guru Drucker (1999) differed with other respected management revolutionaries such as Taylor, Sloan, Fayol, Du Pont and Ford that there can be such a thing

as one right organization. According to Drucker (1999, pp 11), “there are only organizations, each with its own distinct strengths, limitations and specific applications.”

However, despite these differences, the four keys to effective measurement transformation believed to be applicable to all organizations are: context, focus, integration and interactivity (Spitzer, 2007). Gryna et al (2007) argues that the “organization of the future” is going to be the one influenced by two systems which are the technical and social system. In everything management does they should not get trapped in the technical language but also consider the social context or environment into which decisions are implemented.

Having taken note of the above, one sure-fire to show if an organization is now measuring in the right direction is increase in self-management Gryna et al (2007). According to (Spitzer 2007 pp 60), “It is human beings, not machines, who turn data into information, information into insight, insight into knowledge and knowledge into wisdom.” To differentiate themself from competition, management is advised to focus on measures and measurement processes that truly drive performance for their particular organization as illustrated in Figure 10 below (Spitzer 2007).

Very few people are said to know exactly how value is created in their organizations resulting in mismanagement and misdirected behavior (Westhuizen and Wessels 2014). This situation is further complicated by the fact that performance management is becoming more invisible with increase in knowledge workers whose productivity is difficult to measure (Spitzer 2007).

Most important drivers of value today are intangible. According to new MD for Lonmin mine, Ben Magara (World of CEOs 2013) technology can be bought off the shelf to match competition but people attributes such as talent, leadership, knowledge, motivation, employee relations, customer relationship, culture, brands, innovativeness, speed, flexibility, responsiveness, agility, resilience, alliances, knowledge-sharing, ethics, sustainability are the real differentiating factors in the market.

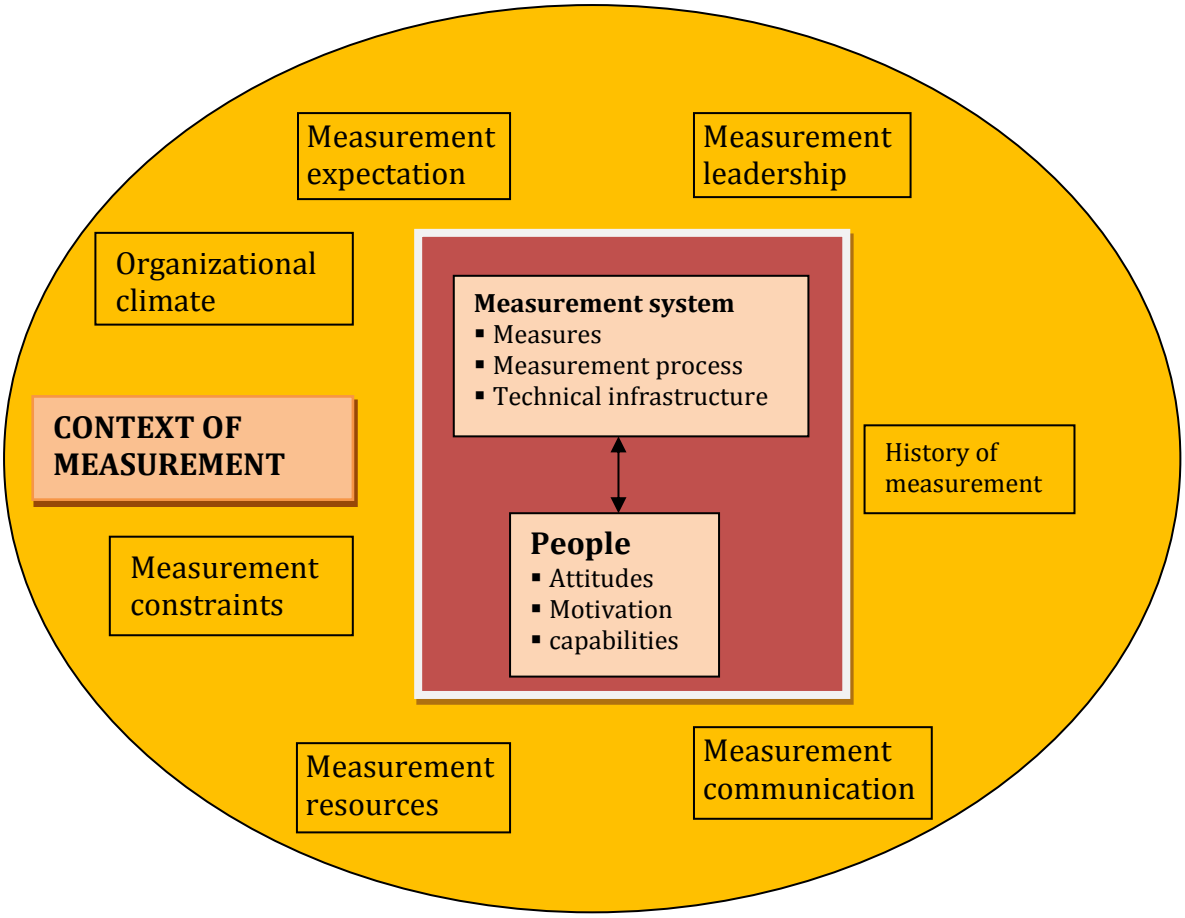


Figure 10: Context of Measurement (Spitzer 2007)

As a result of not measuring intangible assets which account for almost 80% in some companies' market value, many businesses are said to be tracking less than half of their organizational value (Spitzer 2007).

2.8.7 Performance measurement and SME leadership

According to Grobler et al (2006) in some study amongst companies in South Africa, 60% of the organizations interviewed did not have a formal performance management system. Even though intuition is said to be a valuable decision making tool, it is risk over depend on it without some defined systematic tools to achieve repeatability. According to Spitzer (2007), the misconception is that measurement constrains intuition and creativity when in actual fact the two can complement each other. The challenge is that ISO 9000 requires people to be disciplined and follow procedures. However, a shortfall with the standard is that it does not say much on how the measurement system should be established. Gryna et al (2007, pp 451), advises that to create an effective measurement system, there must be "a unit of measure… understandable to all, specific enough for decision making, and customer focused." The challenge for most leadership, however, is in determining the critical

attributes to be measured (Grobler et al 2006). Spitzer (2007) claims that, when too little is measured there is insufficient information to make effective decisions and when too much is measured the decision makers get overwhelmed and buried under the irrelevant data mines. Most managers and leaders in SMEs therefore need to understand that their operational goals are legitimate, customer focused, measurable, understandable, in alignment across the business and equitable (Arnold 2013). In that way, there is predictability and repeatability which gives credibility to any measurement system (Gryna et al 2007). Intuition leadership has the problem that most of its decision making process cannot be transferred to others for continuity purposes and there is no correct history to observe trends for forecasting into the future.

2.8.8 Functional measurement

Gryna et al(2007) states that, to achieve functional measurement; leadership must understand that there are four dimensions to quality measurement which are done for the purpose of: quality control to give feedback and early warnings of problems; operational quality planning to quantify customer needs and product and process capabilities; quality improvement to motivate people, prioritize improvement opportunities and help diagnose causes, and finally strategic quality management to provide input for setting goals and data for performance review. It is however not enough to know how to take measurements and do some simple statistical analysis on product or process quality. Commenting on misuse of measurements, Pratt (1995) accused some organizations of using statistics like a drunkard who uses a lamp post for support rather than illumination. Organizations must understand that one of the real purposes of measurements is to give early warning signs through exposing flaws not to be manipulated to cover up short comings and "look good."

Having gained such information, leadership still has the challenge to make sure the measurement criteria is relevant to the growth stage at which the SME will be as well as stages on the learning curve for different employees (Nieman and Nieuwenhuizen 2010). For example when the SME is just started there will be a lot of indecision on the best way to meet customer requirements yet as time goes on the business is expected to have clearly defined procedures to help maintain standards. For effective communication of the above, it is important to break it down to the language applicable to different people in the organization as illustrated by Gryna et al (2007) in figure 11 below.

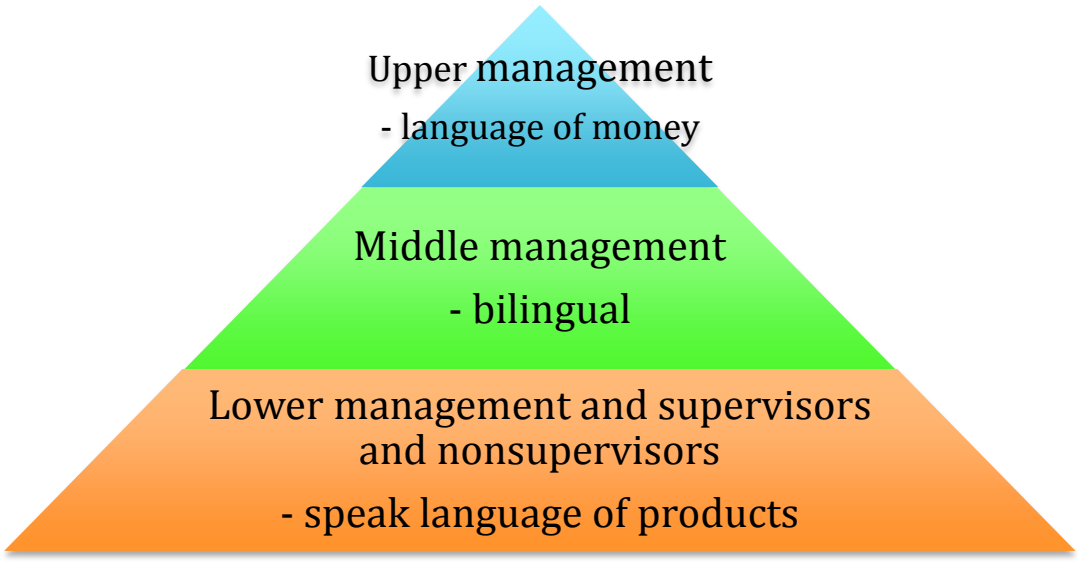


Figure 11: Different Organizational Languages. (Gryna et al 2007)

2.8.9 Ongoing training and quality improvement.

According to Grobler et al (2006), the present government in South Africa inherited a training and education system with a number of shortcomings such as: inadequate planning for future skills requirement and a high number of inadequately trained unemployed youth, amongst many other challenges. This is one of the factors beyond SMEs control even though it affects them. Despite this, leadership must still make plans with what they have.

Before any training commences effective planning must therefore be done on what the organization must gain collectively from the training process (Hunt 2009).All people are said to be a product of their learning or lack of it. Spitzer (2007) argues that, truly successful people are not just those with most information, but those adept at the process of learning which gives creativity beyond the learning curriculum. Most traditional learning involves receiving content from lecture, students getting rewarded during exam for giving back content they received. The challenge is that this result in the education process simply producing uniformly minded people because of learning towards or to the test (Spitzer 2007). Tests are said to be measuring information acquisition not processing, hence the educational process failing to prepare people for innovative thinking. Because of this many positional leaders who are technically competent in a particular area, once they go up the ladder where they deal with issues outside their area of training become ineffective (Nieman and Nieuwenhuizen 2010). To solve this problem there is need on job training to balance theory and exposure for practical learning as illustrated in Figure12 below.



Figure 12: Practical Learning Loop (Spitzer 2007)

QMSs such as ISO 9000get to be understood well in the same way when people have worked with them for a long time, but recently it has been noted however that employee turnover is higher than previous years. Maxwell (2011) noted a case of an Enron manager who started as a trader to associate manager to director to head of her own business unit in less than seven years. Adding to this Gladwell (2002 pp 1 cited in Maxwell 2011) asked "how do you evaluate someone's performance in a system where no one is in a job long enough to allow for such evaluation?" Effectiveness of ongoing training activities in most businesses is not happening because of this.

2.8.10 Beyond certification

After getting the certificate a business is expected to at least maintain the standard levels it attained during audit or improve on it. Consistence is said to only be attained through repeatability and predictability by each operator at different times and between different operators for a similar operation (Soltysik 2012). The challenge with this definition is that it leaves management out even though it has been proved that leadership is key to organization behavior. Wahid et al (2011), in a research on ISO 9000 maintenance conducted 30 interviews and found that management and employees' perspectives on the critical factors of ISO 9000 maintenance were very similar. The critical factors were found to be: management commitment, employee involvement, motivation and reward, continuous improvement, and teamwork. There was also an agreement across various companies that the challenges to sustain the quality system were: lack of cooperation between people, lack of commitment, lack of awareness and understanding on ISO 9000, and lack of communication. It is therefore clear from sentiments above that sustainability of a QMS should not only be looked at in terms what the employees must do or what must be done to them. Instead a holistic approach must be taken which includes everyone in the SME since they are all components or parts of the system.

2.8.11 Sustaining the new system

Defeo and Barnard (2004 cited in Gryna et al 2007) claims that there are six types of break throughs vital to company growth which start with leadership transformation as illustrated

in Figure 13 below. This was in total contrast with many change initiatives which assume that it is all about management changing employees on the shop floor.



Figure 13: Sustainable Organization Transformation (Gryna et al 2007)

As noted earlier by Grobler et al (2006) on functional measurement, there is need for management to have conceptual understanding of various phases of maturity each process goes through. McNamara (1997 cited in Gryna et al 2007) assets that most important business processes are not stable. On his publication of '*Process quality maturity classes*', McNamara claims that, "processes evolve into various phases of maturity, with companies such as General Electric have five maturity phases of ad hoc, consistent, organized, systematic, and statistically stable…pp 210." For SMEs this may be different in some way but the principle should be the same of avoiding the danger of trying to sustain an immature change process. However even if SME management grasps these concepts, if the human component is skipped there is not going to be sustainability (Armstrong 2012). According to Westhuizen and Wessels (2014), most organizations are usually associated with poor employee retention and motivation due to wrong assumption that money is the main reason why employees get frustrated. An information technology firm is said to have conducted a research on intensity of reason why people resigned and employees said; they were not being communicated with, being made to train their bosses, not being given training, not

being involved in setting goals and lack of feedback; higher salary and more benefits were at the end of the list (Gryna et al 2007).

2.8.12 Administration of Non-conformance

ISO 9000requirements are satisfied with simple evidence that NCRs are being implemented and non-conforming products are being managed. There is no mention of who is qualified to administer NCRs for them to be effective and issues such as turnover period to deal with non-conforming material. The standard seems to be satisfied with an organization doing well to control quality of its products rather than going to the next step of quality assurance (Besterfield et al 1995). Such a narrow understanding of quality may result in failure to distinguish between different kinds of errors which range from human error, technique errors, conscious error, communication errors, down to inadvertent errors which workers are unable to avoid (Gryna et al 2007). It is futile however for an SME to be very organized in the way it manages non-conformances without learning from the experiences to move towards total avoidance of non-conformances.

According to Nieman and Rossouw (2008), it is not enough for leaders to be passionate about quality without knowing issues that drive it in an organization such as: effective and constant communication, promoting the right attitude and motivation for employees as well as identifying and developing abilities needed by employees to be effective. Schonberger (1981 pp 351) states that, “Preventing product defects is largely a matter of providing the right operating resources, high-quality purchased materials, a well-trained workforce, a well-designed and well-designed plant, and good tools.”Besterfield et al (1995) agreed with this view, advising that implementation of documents such as NCRs must be done after thorough employee support to enable them to see management’s positive intensions.

2.9 Artkinson’s Do's and Don'ts of ISO 9000 implementation

A summary of what must and what must not be done before and after ISO 9000 implementation can be found in Artkinson (1999)’s findings. Below are the implementation dos and don’ts expected from an SME if it must have a successful and sustainable implementation.

2.9.1 What must be done for successful implementation

An SME is advised to do the following if it must have successful implementation

- Document your way of doing business and align the implementation of ISO 9000 with your business objectives and business practices.
- Document the flexibility you need in your procedures.
- Use the ISO 9000 implementation as a stepping stone to get better efficiency in your operation.
- Choose a Management Representative that is part of the management team, well-liked and respected within the organization.
- Conduct your implementation on a faster-track approach; slow implementations are more disruptive and difficult in the long run.
- Choose an ISO/Management representative who sees the big picture and understand ISO 9000 at a higher level.
- Provide ISO 9000 training to the management level individuals even if you are going to use an external consultant.
- Provide Internal Auditor training to the Management Representative and some other key members of the organization.
- Select a consultant firm with relevant technical understanding of your industry.
- Make sure you use consultants with practical business experience in your field. Check their references and recent certification success stories.
- Check credit history of consulting firms, there are a lot of reputable and yet unreliable entities out there.
- Beware of consultants that quote you a fixed cost without conducting a thorough audit of your operation. They are low-balling to get the job. Once they get it and they do get a feel of the amount of work, they will either start cutting corners to save time, which will put you at risk, or find a way to abort the implementation process in midstream after having pocketed a chunk of money.
- Ask for detailed quotes from registrars that cover a 3-year period, which include the yearly Surveillance Audits.
- Lock in a registration audit date right away, so that all your organization has a clear target and stays focused.
- Choose and treat your Registrar like a long-term partner.
- Use a Registrar's Preliminary Assessment as an improvement tool, as well as to maintain momentum for the implementation.
- If you feel confident that you are ready without having to go through a preliminary assessment, call for a certification audit.

- Parallel process the ISO/EN certification with the preparation of your technical file for CE certification of medical products.

2.9.2 What must not be done for successful implementation

Below are the activities or decisions an SME is discouraged to make to avoid negatively impacting on the success of ISO 9000 implementation.

- Start implementation before an experienced person or a professional conducts a gap assessment to determine exactly what needs to be done.
- Select a consulting or training firm based on cost. The cheap ones will cut corners.
- Create unnecessary work for yourself and your colleagues just to comply with ISO 9000.
- Use canned documentation or wonder software: they just plainly don't work if you want to comply with ISO 9000 and be certified by a reputable registrar.
- Over-document procedures: the more you say the more you commit to.
- Sacrifice the operational flexibility you need for your business to please the auditors.
- Use a consultant that you will have to frequently depend on to maintain your quality management system after certification.
- Use an expensive consulting firm as a guarantee of better results: they usually have large corporation background, and may impose inapplicable requirements to your businesses, or may send their trainees to work on your account.
- Document artificial or hypothetical ways of doing business to please a Registrar.
- Leave the Registration audit date to be determined (TBD) until you assess implementation progress.
- Think a Registrar is here to fail you.
- Use obscure Registrars who may almost give you a certificate for the right price… Their ISO certificates are worthless in the eyes of the business community.
- Implement SPC if it does not make sense for your process.

2.10 Theoretical framework

In Figure 14is a theoretical framework highlighting the theoretical concepts discussed in the literature review. Data to be collected is going to help confirm directly and indirectly if these concepts are true or false.

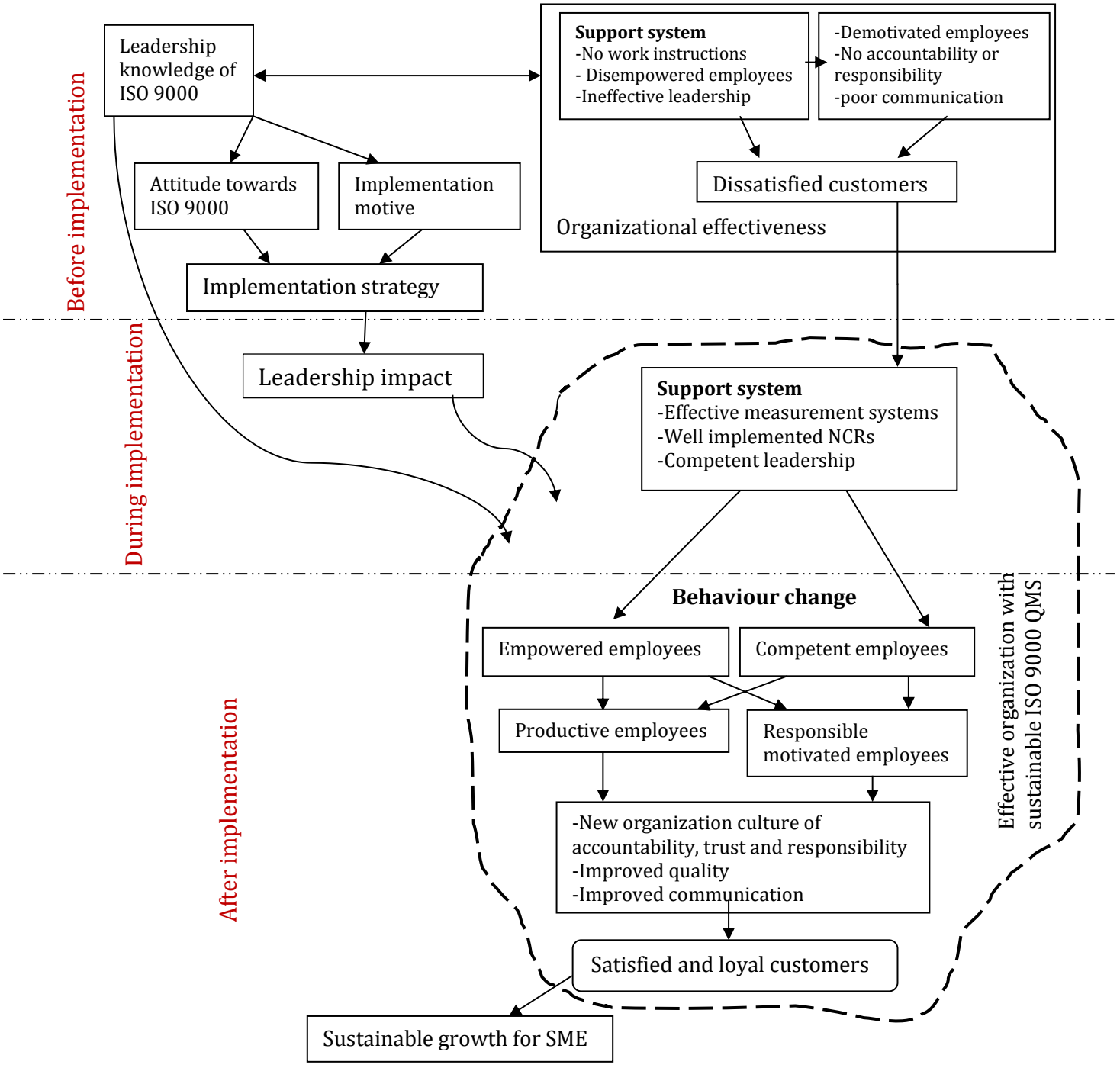


Figure 14: Research Conceptual Framework

Chapter 3. Methodology

The purpose of this chapter was to give a description of; how and why data for this research was collected, tools used to gather data, how the collected data was analyzed and presented. Since the research's aim was to get a complete and detailed description of what was being observed and not to count things for quantification, a qualitative research approach was used instead of a quantitative research (MacDonald and Headlam 2011).

3.1 Research type and method

A case study research approach was the most effective way to make direct and on-the-spot data collection since the research intended to observe, how human factors impact on the outcome of ISO 9000 implementation to an SME in SA (Yin 2009)? The research qualified as a case study because it involved a bounded system in the form of an SME which "fences" in influence of human factors as the subject to be studied with success or failure of ISO 9000 implementation as the unit around which there are boundaries (Merriam 2009).

3.1.1 Why cases study?

According to Mas (2011), amongst the four major qualitative research methods, a case study method was the most suitable because:

- Phenomenology approach could not be used since it seeks to establish commonalities across individuals in a group by gaining access into their life-worlds not how they corporately impact on ISO 9000 implementation.
- Ethnography approach focuses purely on the concept of culture in a group which was going to limit the research to meet its objectives.
- Grounded theory approach focuses on the development of inductive, "bottom-up," theory that is "grounded" directly in the empirical data. Again this research did not have any specific theory to elaborate on which could have justified using a grounded theory approach.
- Case study approach asks the question of "what are the characteristics of this single case or of these comparison cases?" this was the most appropriate approach to this research as further explained below.

According to Yin (2003,) a case study design should be considered when:

(a) The focus of the study is to answer "how" and "why" questions;

(b) You cannot manipulate the behavior of those involved in the study;

(c) You want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or

(d) The boundaries are not clear between the phenomenon and context.

Yin (2003) further claims that, a case study is the best research approach when a researcher wants to know how and why certain behavior or results occur. From this explanation, the best way to understand the impact of human factors to ISO 9000 implementation had to be done in the form of a case study. The case study also had to focus on one SME expecting to come up with conclusions possibly applicable to a few other SMEs instead of using simple statistical procedure which would have law generalizability (Brown 2008).

Within the single case study realm, this research was described as an instrumental case study because it sought to provide insight on the phenomena of human factor influence to ISO 9000 implementation using implementation of the standard at Laursens Engineering (Mas 2011).

3.2 Population and sample

3.2.1 SME study population

Non-probability sampling was used since the research was more interested in depth or saturation on a focus area to avoid generalization as much as possible (Mehta et al 2012). Depending on specific phenomena under consideration, employees and leaders in the company were involved differently and at different stages.

Since this was a small company with total employees varying between 25 to 40, no special research sample was designed. This was because the researcher had access to all people easily. To some extent, however, the Snow ball sampling method was used since some items under observation would start at a particular point triggering further investigation of other related activities (Mehta et al 2012). The people in the company could, however, not equally participate since they have different duties and competencies resulting in them having varying influence to ISO 9000 implementation.

3.2.2 External interview candidates

Selection of SMEs which implemented ISO 9000 for external interviews was intentionally done with some balance between SMEs that successfully implemented the standard and those that did not. Since the researcher did not have knowledge about these SMEs, the

consultant being used for implementation at the SME under study was used to select from amongst those he had consulted for before. Because all the SMEs had attained certification by meeting the minimum requirements, successful implementation was not defined as getting the certificate. Rather, successful implementation was defined in the same way as in section 2.3 in literature review chapter by Poza et al (2009) where an SME must demonstrate that the QMS exists and is also functional. Since the consultant was still consulting with the SMEs to maintain the standard after certification, he knew better SMEs which were struggling to maintain the standard and those that were not. The consultant thus managed to select a total of six SMEs listed in Appendix 16, of which three were said to have successfully implemented the QMS, with the other three having mainly achieved existence of the QMS.

3.2.3 Internal interview candidates

The interview candidates listed in Appendix 18 were selected with intentions to make each and every shop floor department. The internal interview candidate list also varied from employees with little experience to the most experienced.

Because there were only two managers, interviewed were not done since the researcher directly solicited their views through formal and non-formal discussions during the research period. For management, observation results were going to be more credible than interview results since there was high risk of bias because they were directly interested in the implementation and answerable to the shareholders (Yin 2003).

3.3 Research Instruments and Data Collection

Two primary data collection methods of observation and interviews were used and one secondary method of company records was used as explained below. Since each research instrument had its strength and weaknesses (Mehta et at 2012), a three-pronged approach had to be used to counter balance each instruments' demerits as explained below:

3.3.1 Observation

The range of observations varied from: the whole SME as one big group, management, all employees, subgroup amongst employees as well as individuals in the organization. Creelman's five elements of engagement measurement below (Creelman 2010).

i. Clarity: Is management clear about goes for ISO 9000 implementation?

ii. Support: are the employees getting support they need to deliver quality products such as properly serviced machines, measuring tools and necessary training for inexperienced employees?
iii. Fit: are the people being given duties which match their skills?
iv. Feedback: are employees getting regular feedback on their performance, what approach is used to give feedback when there are non-conformances, what feedback is given to a new employee or employee performing a new task?
v. Development: what is the strategy to replace old employees, train younger inexperienced employees?

Different observation stances

Various observation approaches mentioned in Figure 15 below were used. The purpose of the observation method was to try and yield the information which management or workers are normally unwilling or unable to provide (Dawson 2002).

Upon arriving at the company, the researcher spent first two weeks as a complete observer to get a fair understanding of what was happening without distracting himself by taking any notes. After this stage the different observation approaches were applied before, during and after implementation on anything related to the research. The researcher took this approach because different activities were happening simultaneously. As the observer thought of what he was observing, he could be forced to want to collect more data or observe further the same process or have a personal feel of what was going on (Seidel 1998). According to Seidel (1998), this process is recursive in that one part of analyzing data may take the analyst back to observe more and back to re-coding till a conclusive observation is reached hence the researcher had to be on site and at times even participating to achieve better proximity. Sometimes the observer would be forced to become a full participant of what he was busy taking observation notes on, for example if some worker was in need of some assistance with the researcher being the only close by person. Since cooperation of employees was pivotal to the quality of this research, the researcher would grab any opportunity to establish a working relationship by helping the struggling employee (Kawulich 2005). It is for this reason that any of the observation stances related by Kawulich (2005) in Figure 15 below could happen interchangeably or simultaneously.

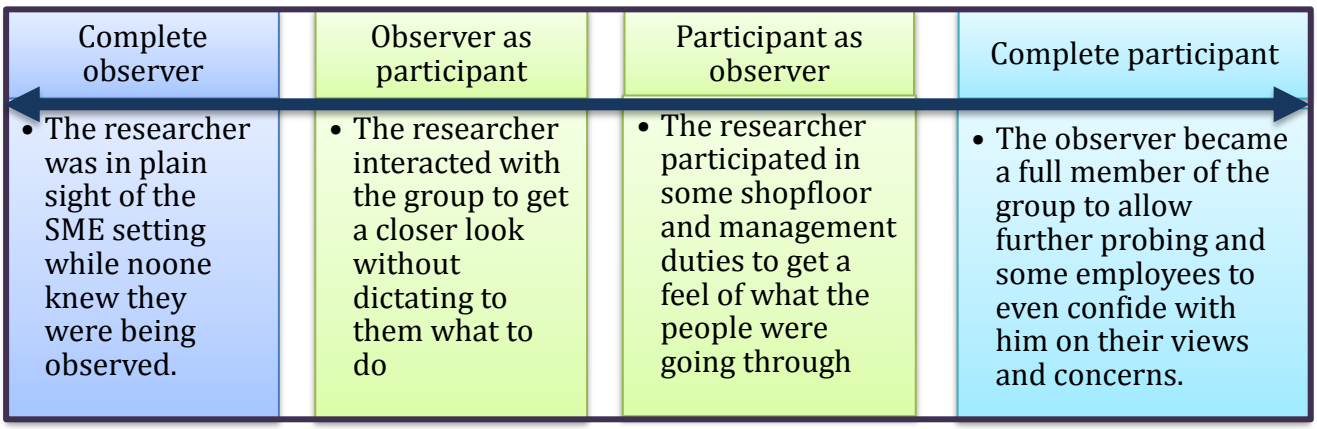


Figure 15: Different Observation Stances Continuum (Kawulich 2005)

To understand the impact of human factors on ISO 9000 implementation in the SME there was need to make repeated observations over a period of time. A longitudinal observational research approach (which was one year in this study) was thus taken so that the transformation from what was happening before implementation to the new error after implementation can be observed and compared to establish if the change was for better or for worse (Brereton et al 2008). This approach was the most suitable way to achieve the research objectives because events unfolding in the SME were progressively dynamic creating the need for an approach which also evolves with time to remain relevant at each moment (Holland et al 2006).

Each of the extreme ends of the research continuum above had its own advantages and disadvantages as explained below.

Complete observer

The disadvantage of this approach was that it heavily depended on the ability of the observer to observe and correctly interpret what he was observing. The advantage was that any observations which were unclear to the observer, he could immediately ask the person performing the activity to clarify making it very current.

Complete participant

Outcomes of observation could wrongly be influenced, for example operators could diligently follow work instructions because someone from management side was closely watching. The approach however helped to convince employees that the observer was not there as a spy but as part of the team.

A summary of the observations made was recorded from Appendix 1 to Appendix 14.

3.3.2 Personal interviews

Because the objects of inquiry in the interview were human beings, even though this interview did not have much sensitive issues involved, Wits University ethical consideration were followed before any interview commenced. For instance all interviewees were told that they were free not to participate or to stop during the interview if they felt so. Of all other interview methods useable, personal interview method helped to collect a lot of data (Dawson 2002).

Interviews were done as explained below.

3.3.2.1 External interviews

Personal interviews were done on six SMEs with managers responsible for implementation of ISO 9000 using questionnaire in Appendix 15to establish:

i. The activities they carried out which they believe helped them to successful implementation (The dos).
ii. The activities they believe brought negative results to ISO 9000 implementation if there are any (The don'ts).
iii. Reasons why they implemented the QMS.
iv. Benefits they received from the standard
v. How the QMS impacted on their employees

The disadvantage of these interviews was that there was room for bias since the managers may not want to embarrass themselves by admitting the negative issues (Rajendram 2001). Again since the responsible manager had personal attachment to the implementation, there could be exaggeration of positive results for one's self esteem (Pinchot and Pinchot, 1993). However, one set of interview questions was used for both SMEs who successfully implemented the standard and those who did not. According to Denzin and Lincoln (1998), this approach helps to avoid bias of interviewees being defensive after being told they poorly implemented the standard.

3.3.2.2 Employee interviews

The researcher interviewed some of the key employees in the operations of the SME upon realizing that employees' behavior could be misrepresented by management or the researcher either intentionally or unintentionally (Seidel (1998). Internal interviews were done after the ISO 9000 certification using one semi-structured interview (Questions shown in appendix 17) to assess if management had effectively engaged employees during

implementation and if the employees understood the QMS as per Kirkpatrick's model below (Bacon and Pool 2003).

- Level 1: Reactions. What the employees know and think about the standard
- Level 2: Learning. What the employees learnt about ISO 9000, their responsibilities and expectations
- Level 3: Behavior. What learning, skills, etc., did the employees attain on the job which they used not to?
- Level 4: Results. What changes in results and productivity have been observed on the job after different activities on the shop floor?

As noted in the literature review earlier in section 2.6.15, employee engagement and understanding has a vital impact on the QMS. Candidates for the interview were thus, those critical to product quality or team leaders which were the production supervisor, tool room supervisor, tool setters, welders, press operators, trainee supervisor, drill press operator, QC officer as shown in Appendix 18 below. To help assess the validity of these employees' comments they were asked about their basic understanding of what ISO 9000 is? This question helped to check if one knew what he was talking about. However even if employees showed lack of understanding, their views were not discarded since they still had an impact on the QMS whether they understood what it meant or not.

In both external and internal interviews, the interviewer strived to master the art of "interested listening" to motivate the respondents during participation without showing any judgmental attitude to the responses (Denzin and Lincoln 1998). The interviewer also had to establish balanced rapport whereby he had to be casual and friendly on one hand for respondents to be at easy however balancing it with being directive and impersonal for the respondents to take the interview seriously.

3.2.3.3 Management Interviews

Unstructured interviewing was used on management. When the ISO 9000implementation visited and gave the task list to the management representative, the researcher would use open ended questions to ask how the represented intended to meet the task. Open ended question were most applicable to this scenario to give the responded freedom to fully express their opinion without simply trying to give the correct answer (McLaughlin 2003). This was also part of where the researcher got insight on what to monitor closely with different observation approaches.

3.3.3 Company records

Data within the company and customer surveys was used to collect secondary data. According to Erasmus et al (2007), important company data to analyze include performance changes brought by ISO 9000 such as management of non-conforming material (Appendix 25 and 26), weekly meetings minutes (Appendix 23 and 24), training records, human resource planning and career development, appraisal records etc. The collected data ranged from before to after implementation of ISO 9000. Since ISO 9000 is concerned with documentation of procedures and management of documents, the type of records made as well as how they were managed gave a clue on the SME's attitude towards the QMS.

The disadvantage of this method was that records of old management could easily be used to judge new management when they actually could have a different management approach.
The advantage of company records however, was that one could revisit them months or years after implementation to assess the SME's real intentions for implementation as seen with recording and management of NCRs in chapter 4.

3.4 Pilot study

According to Yin (2009), a pilot study was supposed to be done for the external and internal interview questions shown in Appendix 15 and 17 respectively, for the purpose of revealing any possible omissions which the researcher could have done especially in the areas of:

i. Testing if there was any bias in the questions.
ii. Checking if the questions were logically structured for a smooth thought process as the interviewee was answering the questions.
iii. Checking if ethical considerations have been effectively covered.

According to Maxwell (2005), the main purpose of a pilot study is to help design a further confirmatory study so as to avoid doing the main study using premature methods. Yin (2009) concurred adding that, one of the main reasons to conduct pilot studies was to make sure all the relevant data collection issues are encountered before the real case to make any adjustment with respect to both content of data to be collected and procedure to be followed.

Since the research sample was small, to avoid doing the pilot study whilst still achieving the objectives of the pilot study the following precautions were taken.

- For external interviews, the questions were given to the ISO 9000 implementation consultant who worked with the other SMEs so that he could help if the question made sense to him and if they captured the intended data.
- For internal interviews informal discussions were done with both the least and the most experienced employees to check if questions were being understood and if intended data was going to be captured.

3.5 Data analysis

The collected primary and secondary data was processed and analyzed separately because the source of data also affects parameters such as coding and filtering (Cresswell 2007). The collected data was analyzed per phase using thematic content analysis procedure since there was need for more involvement and interpretation from the researcher starting from before, during and after ISO9000 implementation (Anderson 2007). Figure 16 below shows how the research progressed from data collection to data analysis.

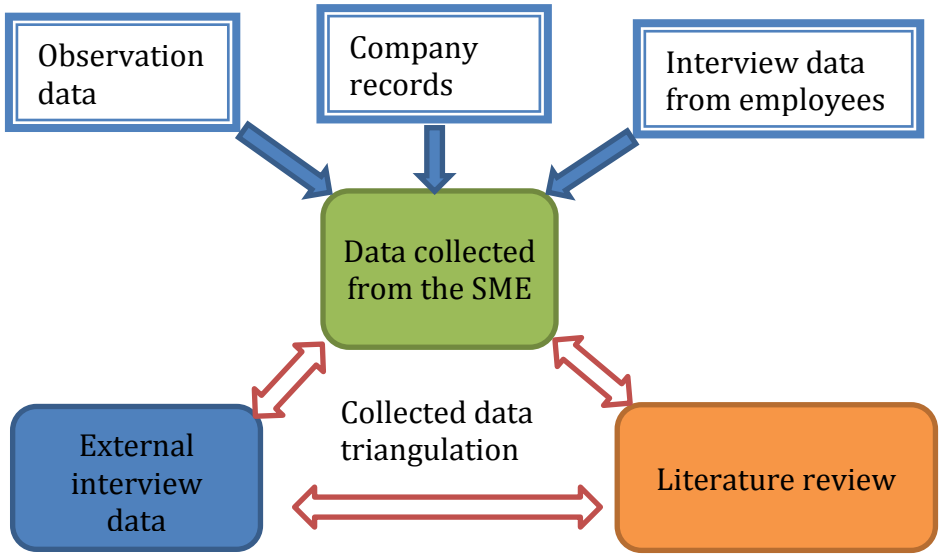


Figure 16: Data Collection, Analysis and Discussion (Yin 2003)

Data to be analyzed came from three sources which were:

- Literature by other scholars and industrialists related to impact of human factors to implementation of the QMS.
- Data collected from the SME which was a combination of observation data, company records and interviews with senior employees.
- Personal interviews with people from other SMEs involved in ISO 9000 implementation with their companies.

Coding was done to summarize, synthesize, and sort observations and other collected data to help develop the analysis base through pulling together and categorizing the discrete events and data (Seidel 1998).

Behavior change was not easy to measure since it was difficult to quantify but trends in issues such as internal NCRs were believed to be true indicators of the work ethic and attitude amongst employees.

3.5.1 Analysis of observation data

Below is a summary of how all the collected data was analyzed as according to approaches shared by Miles and Huberman (1984):

- Documentation of the data and the process of data collection
- Organization/categorization of the data into concepts
- Connection of the data to show how one concept may influence another
- Corroboration/legitimization, by evaluating alternative explanations, disconfirming evidence, and searching for negative cases
- Representing the account (reporting the findings)

According to Cresswell (2007), data analysis in qualitative research consists of preparing and organizing the data for analysis, then reducing the data into themes through a process of coding and condensing the codes, and finally representing the data in figures, tables or in form of discussions. The analysis of observation data was not going to be a once off straight path from data collection to analysis and conclusion. Seidel (1998) claims that, this is an on-going process which involves a couple of rounds. This was because, as the observer notices interesting things to the research, collects data, things about the collected data in relation to the research objective, the observer would go back to make more observations and so on as illustrated in Figure 17 below.

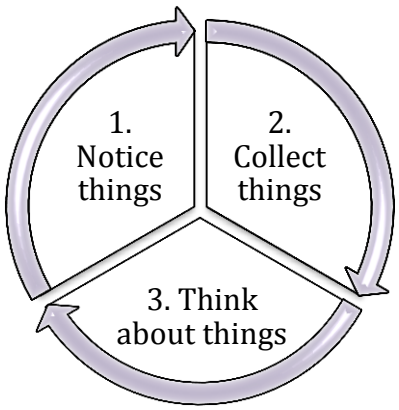


Figure 17: Qualitative Data Analysis and Processing (Seidel 1998)

3.5.2 Analysis of company records

Company records were used to help confirm or clarify on observation and interview data. For example, after observing some behavior element on employees about product quality, NCR trends were used to see how the observed behavior was impacting on product quality.

3.5.2 Analysis of interview data

According to Denzin and Lincoln (1998), in sociological terms, challenges in framing interviews come from the type of interview selected, the techniques used, and the ways of recording information. All these elements come to bear on the results of the study. For this research, there was need to constantly connect current data being observed, interview results and company records.

Narrative methods are said to use interviews and sometimes documents or observations to "follow participants down their trails" (Riessman2000). Unlike conversation analysis, which focuses attention on moment-by-moment interchange, narrative analysis seeks to put together the 'big picture' about experiences or events as the participants understand them. The focus is on the story itself and seeks to preserve the integrity of personal biographies or a series of events that cannot adequately be understood in terms of their discrete elements (Riessman 2000). Narrative "displays the goals and intentions of human actors; which makes individuals, cultures, societies, and historical epochs comprehensible as wholes" (Richardson 2004).

In this research recommendations by Rückert (2007) on general steps of qualitative interview data analysis for the two interview sets were shown below:

i. Transcription, where audio recordings were translated to written down raw data coming out of the interview.
ii. Intra-case (single-case) analysis for each interview was not done since the researcher did not want to focus on an interview case but how different interviewees related to each particular case.
iii. Cross-case (generalized) analysis across many similar interviews. Raw data in Appendix 3 and 4 separately used to compare answers across interviewees per each question.
iv. Proof of results was summarized separately to further analyze it with other data collected in the research.

3.6 Combined Tabulation and Data Analysis

After classification, inter and intra-class data analysis was carried out to do some relational inference (Yin 2003). Where comparison was needed such as for NCR trends, tabulation was used to compare to help with clarification of observed attributes. Tabulating data helped in reviewing impact of ISO 9000 implementation, whether the company was getting better or worse in terms of the human behavior change in product quality.

3.6.1 Data Triangulation

Since each data collection method had strength and weakness which would risk quality of the research outcome, it was necessary to triangulate the data (Yin 2003). Triangulation helped to capitalize on each data collection method's strength and minimize weaknesses during results analysis and discussion as illustrated in Figure 16 above. Because the collected data was all aiming to corroborate the same phenomena, the best triangulation approach was the data triangulation procedure (Yin 2009).

Below are some weaknesses of each data collection method which data triangulation helped to minimize.

3.6.1.1 Literature review.

The method works well to cover a lot of ground on related issues at different geographical and chronological points. The method has a short coming at times of not being relevant to the research being carried out due to different backgrounds. For example as witnessed by Drucker (1999) earlier, some documented labor management techniques working in developed countries are failing in developing countries due to difference with skills levels. There are therefore chances that due to different cultural and political backgrounds across different countries and continents, what one author recommends as best implementation strategy in Taiwan may be inapplicable to the SA context.

3.6.1.2 Observation method.

The method works well to collect timely data. The observer can verify what's being observed by asking for clarity as the event happens. This results in minimum distorted comments due to people lacking memory of what transpired. The method has a weakness on generalizability of its findings since the setting could be very unique to any other seemingly related case. As Pannucci and Wilkins (2011) claim, it would be risky to simply assume that observations made on one SME's response to ISO 9000 implementation will be the same for

another different SME. Particular characteristics to each SME such as the competence of its management, leadership philosophy, type of industry, political environment, employees' cultural and academic backgrounds cause generalizability of observations results very difficult.

3.6.1.3 Company records.

The advantage was that people freely recorded information on a normal day to day basis which gives a true reflection on their attitude. The disadvantage of the method was failure to show the environment setting of the day the information was recorded to establish reliability of the records.

3.6.1.4 Internal interviews.

The advantage was that the interviewer could easily design a questionnaire relevant to the environment setting since the researcher knew the SME employees. The disadvantage was that preexisting relations with the researcher could easily tempt employees to be biased positively or negatively.

3.6.1.5 External interviews.

This method had the strength of uncovering other SMEs experiences with ISO 9000 helping to compare with what was being observed at Laursens Engineering. It is after having observed similar phenomena from the observation of the case in study and the interview outcomes that some conclusions can be generalized with great confidents.
The above methods thus need each other for validation and generalization of each method's findings (Brown 2008).

3.7 Validity, reliability and generalizability of data

For this research to be credible, it addressed three key issues which are commonly described as validity, reliability and generalizability. If any of the data collection methods used was not properly attended to, it was going to affect any of these elements. According to Pannucci and Wilkins (2011), bias can occur at any stage, from design of the research methodology down to data analysis and presentation, hence each and every stage of the research must be monitored to curb any risks. An illustration below in Figure 18was used to show the different sources of bias in Clinical research and the illustration suites well in principle for this case study.

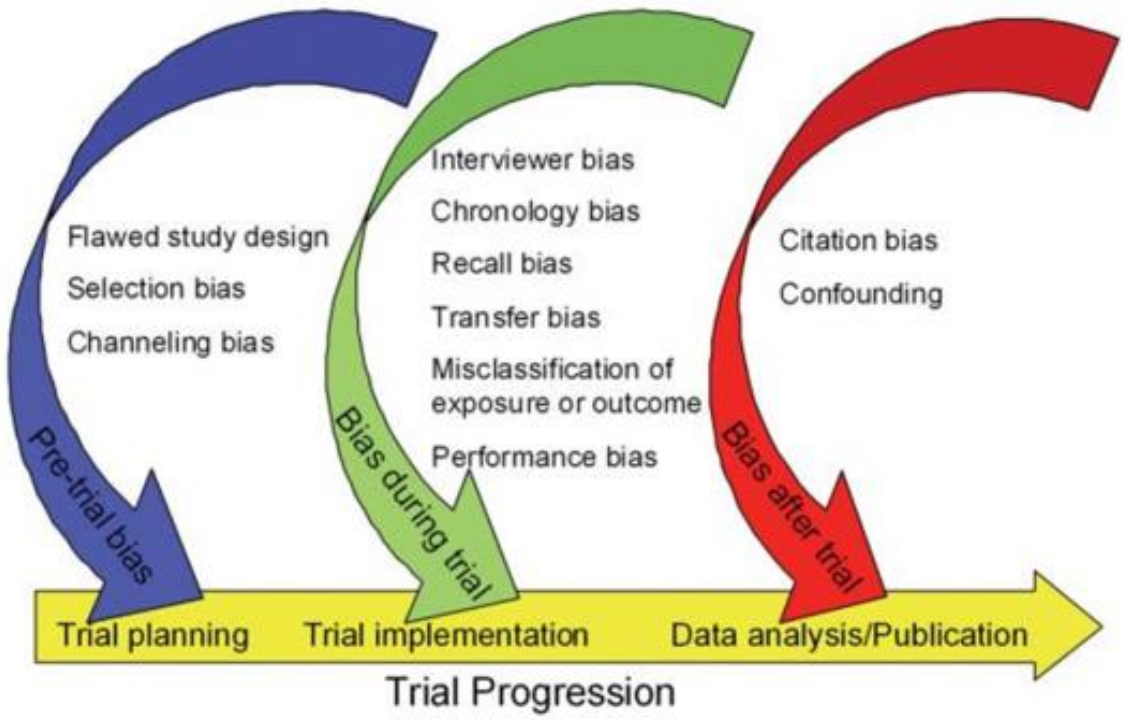


Figure 18. Source of Bias in Qualitative data (Pannucci and Wilkins 2011)

The different types of expected bias in this research are stated and explained below

3.7.1 Validity

As a qualitative research to a particular SME, this research lacked the benefit of previously planned comparisons to help on controlling any validity threats (Maxwell 2005). In other words, this situation invites questions such as 'how will we know that the conclusions are valid?' (Maxwell 2005).Two expected threats on validity of this research were treated as below to make the research more valid.

3.7.1.1 Researcher bias threat

There are many ways in which the researcher could contribute to distortion of the research findings as highlighted below by Pannucci and Wilkins (2011).

- Flawed study design could occur due to incompetent or under trained study personnel. For this research, one observer was used hence no inter-observer variability was expected.
- Selection bias during selection of the study population or interview candidates was also an issue. Originally, on interview of SMEs, the researcher intended to separate them into those who experienced successful implementation and those who did not. This pre-determined grouping had flaws because it was difficult to accurately classify SMEs in these two groups. One SME could have challenges in the way it handled its

pricing whilst it was better on traceability of products compared to other SME which would be very organized on its pricing strategy.

- Interviewer bias could occur due to the systematic difference between how information is solicited, recorded or interpreted. This bias is said to be more likely when interviews are unstructured since the interviewer cannot exactly remember and ask the same question to different people at different times. Also the interviewer may be influenced by cultural or perception issues when he or she meets the interviewee. To avoid this bias, all the interview questions were structured and the interviewer did audio recording to make sure he does not miss some points while jotting down notes.
- Risk of misclassification of SMEs and results was real especially in determining which SME must be described as a failed case and a successful case. The researcher was meeting all these SMEs for the first time and could not tell which one successfully implemented the standard and which one did not. An independent person who knew the SMEs before and after implementation was therefore more qualified to judge the unsuccessful from the successful. This person was also supposed to be a person who understands what ISO 9000 is so that they would not just do guess work. The person to judge was also supposed to be a person without interest on the classification of the SMEs.

  The most qualified person to do classification of SMEs was therefore found to be Wayne Sherriff of ISO quest. He qualified because he was involved with their implementation hence he knew their state before and after. Less bias was expected from him since the SMEs all got their certificate which means he was successfully involved hence he wouldn't have much special interest. Sherriff was also qualified to judge because he was a qualified ISO 9000 auditor. He separated them basing on amount of transformation achieved and their daily struggle to maintain the standard.

3.7.1.2 Reactivity threat

The researcher may again knowingly or unknowingly influence the setting or individuals by manipulation to achieve certain desired outcomes (Maxwell 2007). Confounding bias could occur when the observer interprets what he is observing basing on some norms like older employees hate change, hence even if it was leadership's fault he would interpret it as resistance from senior employees (Abdul 2012). This threat was not expected to take serious precedence because the researcher was merely observing to see outcomes. Even though eliminating the influence of the researcher was almost impossible, the researcher was not

trying to prove a preset theory such that he would bend facts to any desired destiny (Maxwell 2005).

3.7.2 Reliability

According to Trochim (2006), when data has a multidimensional structure, Cronbach's alpha, which is a coefficient of reliability is used to measure how well a set of items measures a single one-dimensional latent construct, will be very low. In other words, the more unstructured data collection was, the more risk of losing reliability since there was no clear path for the process to be repeated. However, the more structured the process is, the more attraction for validity threats that some vital items were cut off before data collection began.
To improve reliability of the study, Trochim (2006) recommends dealing with the four dimensions to reliability below:

i. Inter-observer reliability. There was no risk of variance in which different observers view any phenomenon since it was one observer conducting the research.
ii. Test-retest reliability. The risk of consistency of any measure from one time to another was countered by conducting similar observations repeatedly at different times and using one set of interview questions to all respective interviewees.
iii. Parallel-forms reliability. Most of the activities observed were being done by one person so not much of this risk was expected.
iv. Internal consistency reliability. One set of interview questions used per each interview run to allow for consistency and comparability of results.

3.7.3 Generalizability

According to Remenyi (2008), there is need for each academic research to produce a contribution to the body of knowledge and there are three different types of theoretical contribution:

- Substantive level theory which involves minor abstraction.
- Midlevel theories involving more abstraction.
- Formal level theories involving highest level of abstraction.

Remenyi (2008) went further to disagree with some scholars who believe that a theory is either generalizable or not, and claimed that there are degrees of generalizability with respect to each situation relative to the original case. For this research, not every conclusion reached will be directly representative or applicable to other SMEs because:

- Number of interviewed SMEs was small
- Other SMEs may be in different industry sectors to Laursens Engineering.
- Other SMEs may be having different internal cultures distinct from Laursens
- Leadership styles and competencies may be different
- External environmental factors such as the trade union influence, type of customers and competition as well as specific government policies

According to Pannucci and Wilkins (2011), citation bias affects generalizability of a research in that some results which are supposed to show how the findings are applicable to other organizations may be omitted. This happens especially when the researcher had predetermined outcomes he or she expected or when research sponsors feel the outcomes may affect them negatively. In this research, the researcher had no specific outcomes he expected to force him to make subjective decisions. For example if the objective of the research had been to find out how human factors negatively affect ISO 9000 implementation, it was going to be difficult to publish results which show that human factors also contribute positively. Instead, the objective of this research was mainly to find out how human factors impact on ISO 9000 implementation whether negatively or positively.

However, even if results of the interviews may be difficult to directly transfer to other SMEs, they will be helpful in giving indications and clues of what to do and what not to do when implementing ISO 9000.

Chapter 4. ANALYSIS AND RESULTS

4.1 Background to results

This chapter presented and analyzed results for the different data collected from observations, company records internal interviews, and external interviews as originally discussed in the preceding methodology chapter. A brief history of Laursens Engineering was presented below to give some illumination on where the results were coming from.

4.1.1 An Introduction to Laursens Engineering

Laursens Engineering has over 40 years in industry supplying components to the manufacturers of delivery truck bodies, trailers, semi-trailers containers and carriage wagons for both road and rail freight industries as well as the scaffolding industry. The company was once part of BTR Dunlop in Rosslyn, Pretoria, before being bought out by management in 1998. In the same year it moved to Sunderland Ridge, Centurion which is its current location.

In 2011, new owners bought the company and saw it grow in sales turnover, new products, new equipment, and attainment of ISO 9000 accreditation as well as achievement of level 2 BBBEE status.

The leadership of the company claims that the company has survived through the economic storms and tough competition from within and without through its holistic definition of quality service as:

- Delivering the right product at the right time.
- Meeting or exceeding customer expectations on all products.
- Consistently supplying products that conform to SABS standards.
- Utilization of a workforce that is trained and qualified to do the job.
- Innovation on the current processes and new products introduction.

4.1.1.1 Events for the project

Date it started the ISO 9000 implementation August 2012

Date of certification	13 June 2013
Next audit date	22 April 2014
Last date of observations	11 February 2014

4.1.1.2 Current Organization Hierarchy

The organization structure of Laursens Engineering is shown in Figure 19 below.

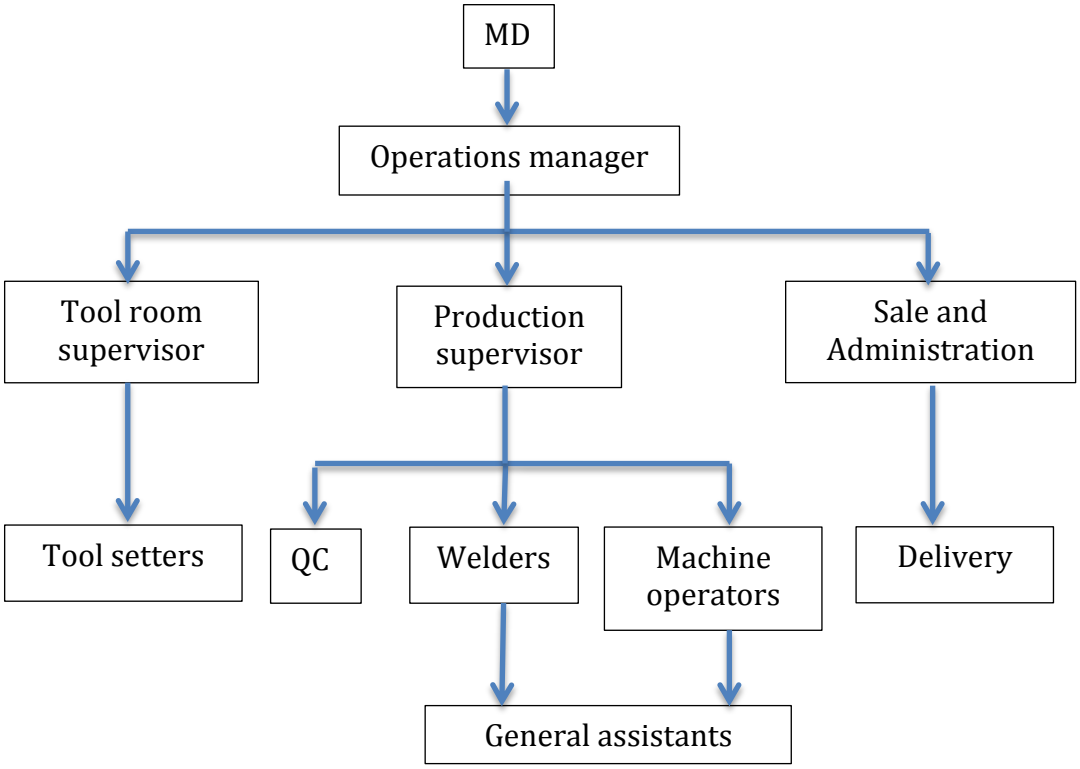


Figure 19: Laursens Engineering Organization Structure

4.1.1.3 Typical Laursens Business World

Figure 20 is the business world in which Laursens Engineering operate in

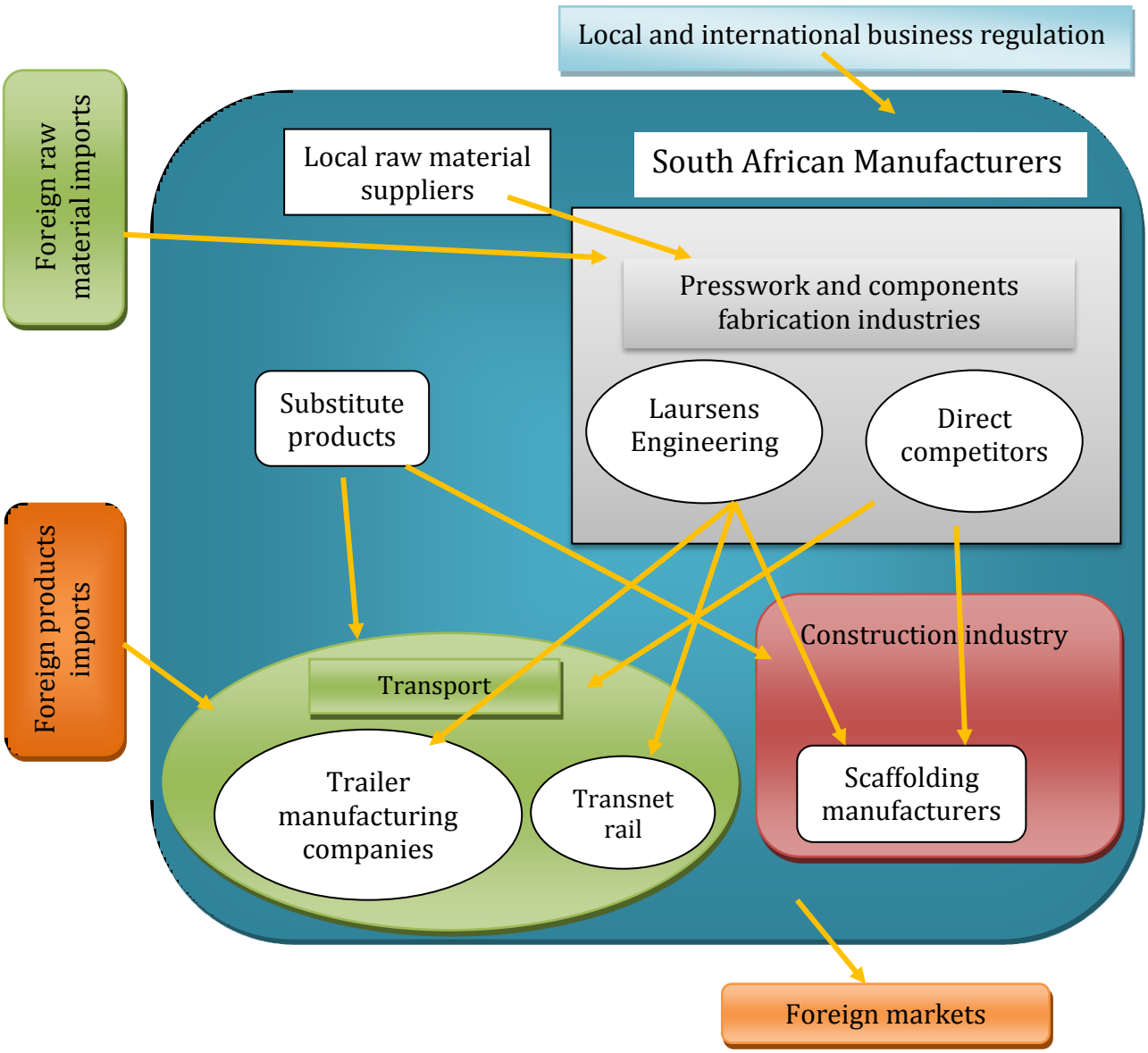


Figure 20: Lausens Engineering General Business world

4.2 External interview results

The external interview questionnaire used is shown in Appendix 15 and the interviewee profiles were tabled in Appendix 16. Results were presented per question for all the six management representatives as shown below and analysis was presented under each answer.

1. When you made the decision to get ISO 9000 accreditation, what could have been the four main benefits you expected to get?

SME-1	SME-2	SME-3	SME-4	SME-5	SME-6
To have a system or standard procedures in place	To be able to deal with customers such as Eskom and Sasol	customer service; documentation; clear procedure for doing things	To have standard procedure to follow	To comply with industry standards; a quality system in place to help track things; documented work procedures	To achieve highest standard in all aspects of business; to match with other companies already higher; more efficient

- Different intentions emerged, those that wanted to have a system, those that wanted some standard procedure of doing things, those that wanted to prove something to the customers and those that simply wanted some documentation.
- These various reasons for implementation can be put into two clear categories of those that sought internal transformations and those that sought to present something to the customers.

2. Did you achieve the level of improvement you expected in these benefits?

SME-1	SME-2	SME-3	SME-4	SME-5	SME-6
Yes; now there is a clear way of doing things	Yes; we can place tenders with above customers	Yes; a lot of transformation in five years.	Yes; more traceability and consistent way of doing things	Yes; can track procedures, can bid more tenders; customers have confidence.	Yes; but not yet there. Keep set new targets progressively

- All claimed to have achieved what they wanted.
- Both internal and external goals seem to have been met differently
- Limited understanding of the standard as a continuous improvement tool except representative for SME-6.

3. What were the four major challenges you met during implementation?

SME-1	SME-2	SME-3	SME-4	SME-5	SME-6
Difficult to get a good consultant who understands you and changing human behavior especially older employees on completing paperwork	Time consuming on paperwork. Need people to fill paperwork at times it delays production.	Resistance to change and fearing to leave comfort zone	Lots of paperwork	Not many. Company was two years old so a lot of documentation was needed.	Changing employee behavior e.g. PPE. Follow up verbal quotations with paperwork. Customers must make purchase orders not verbally. Clients frustrated with change to more tedious way

- They all could not name four challenges but the challenges included getting a good consultant who understands the SME, changing human behavior/resistance to change, time consuming, lots of paperwork/too much documentation and clients frustrated with some tedious changes.
- Interviewees could have said it differently but outstanding challenges were to change human behavior and too much paperwork or documentation which was time consuming.

4. What are the four challenges you still meet as you try to remain compliant/certified?

SME-1	SME-2	SME-3	SME-4	SME-5	SME-6
Low level of conceptual understanding with some employees hence training difficult.	For all employees to follow procedure and meet new standards consistently	Different customers say the same thing differently or at times have different standards and procedures	Continuous nurturing of new behavior	Training staff and making sure they follow procedure on ground not just doing paperwork	Old challenges still continue. Employees at times go back to old ways. People think documentation is a minor thing. E.g we discovered one valve handle was loose and fixed it while customer was waiting but did not check the whole remaining batch for preventive measures, this is underutilization of NCR documentation

- Challenges that emerge going forward after getting certification seem to be related to ability of employees to learn new skills, backsliding of employees to old ways, discipline to follow procedure and underestimation of value of paperwork.
- All their challenges seem to focus on shop floor people and not management
- The distinct challenge, however, was going back to old ways

5. On a scale of 0 to 10 (with 10 being the score for when ISO 9000 has been very helpful to your organization), how would you rate the usefulness/benefits of the standard to your company?

SME-1	SME-2	SME-3	SME-4	SME-5	SME-6
9/10	10/10	10/10 system established	8/10 Not very good especially on technical issues	10/10 Helpful with traceability	10/10 procedure smoothen operation. In current tough times some people are difficult to pay if there are no papers, lawyers cannot pursue payment.

- Four SMEs gave it 10 out of 10 while one gave it 9/10 and the other 8/10
- They all in different ways found the standard to be helpful.

6. In terms of day-to-day activities/environment of the shop floor what level of change was attained on employee behavior?

SME-1	SME-2	SME-3	SME-4	SME-5	SME-6
Yes. Positive especially with younger people	Yes. Positive, people know clear procedure to follow	Yes; better understanding of what is expected of them	Not really; company was already growing due to doing some things right. Therefore, it was difficult to tell if really its ISO 9000's contribution or not	Yes; people can't just do what they want because of laid out procedure	Yes; even though we must do more managers must lead by example and wear PPE. Do everything daily to make it a habit or life style

- All except one said there is positive behavior change. The one who did not say yes also could not say no but claimed that they already had some positive things happening hence he could not tell if the behavior change was due to ISO 9000 or what they were doing before implementation.

7. Looking at the table below how would you summarize your company's time allocation during ISO 9000 implementation between inputs (paperwork, stock management, buying, storage, etc.), transformation (Raw material conversion to outputs, process improvement, operator training etc.) and outputs (Invoicing, delivery) in percentage?

ME-1	SME-2	SME-3	SME-4	SME-5	SME-6
30-50-20	40-40-20	20-60-20	30-50-20	40-20-40	40-40-20 training and meetings

- No SME spent more than 40% of their time dealing with input issues
- Three SMEs spent less than 40% of their time on real transformation issues.

- Five out of 6 SMEs spent at most 20% of their time on output issues.

8. Lastly what are the 4 Dos and Don'ts you would tell to a company embarking on ISO 9000 implementation?

SME-1	SME-2	SME-3	SME-4	SME-5	SME-6
Understand what it means. Understand how it fits into your organization	Follow the procedure. Do not do short cuts	Understand what it is. Train and continuously evaluate. No window dressing just for certificate	Understand how it works. Follow it. No window dressing	Document procedures. Have a manual once implemented. Make staff aware of what is expected. Don't do it and not follow it	No superficial implementation must focus on process. Differentiate between means and end. Do not set final target at one go, break it down to achievable target. Observe non-negotiables

- Dos were noted to be: understanding what the standard means, understanding how it fits into the organization, following procedure, training and continuous evaluation, document procedures, have a manual, make people aware of it and its expectations from them, differentiating between means to an end on an end result.
- Don'ts were found to be: no short cuts, no window dressing, use it and do not just hang a certificate and no setting of final target to avoid discouraging employees but break down targets to achievable and realistic small goals.

4.3 Internal interview results

The main purpose of this section was to get some understanding of how employees were coping with the standard during and after implementation. The questionnaire in Appendix 17 was used and employees' general profiles were presented in Appendix 18.

Interview results were presented in tables below as raw data of what the interviewees said under each question. Analysis then followed to interpret what the responses meant. Since employees did not have to produce their educational qualifications in the interview, literate employees were simply defined as those who could speak fluent or understandable English.

1. What is ISO 9000 to you?

1 Keeps the company growing, motivates, safety, clean environment for work.	**2** A system to improve production.	**3** Is safety.	**4** International standard to improve work.	**5** Improves press operation.
6 Helps people work better.	**7** It is about quality of the product.	**8** To improve company safety.	**9** Improves workshop and people.	**10** Is about quality.

- Employees associated ISO 9000 with growth, motivation, safety quality, product improvement and improved work environment.
- Even though none could give a complete definition of ISO 9000, they all correctly named its attributes.

2. Has ISO 9000 improved anything on your job or work environment? Examples?

1 Yes.	**2** Yes; it made other people skilled giving me less work to check quality.	**3** Yes; a lot.	**4** Yes; safety and cleanliness.	**5** Nothing.
6 We know better what we must do.	**7** Yes.	**8** Yes; everything is smooth.	**9** Yes.	**10** Yes.

- Nine out of ten said yes except one junior operator (interviewee number 5) who said nothing really changed. This was same person who said the standard improved press operation in the first question.
- It can therefore be safely said all employees experienced some positive change.

1. Do you have the support you need to reach your objectives?

1 Yes; from both management and workers.	**2** Yes; shop floor cooperate on first-offs and management's positive reaction to non-conformances.	**3** Yes.	**4** Yes.	**5** John (supervisor) supports me.
6 Yes.	**7**Yes; I have freedom; only go to ask when I am stuck.	**8** Everything is fine.	**9** Yes.	**10** Yes; but need equipment to load heavy material.

- Nine out of ten employees said yes. The same employee who said nothing much has changed said it was only the supervisor who supported him.
- Even though all employees said they were getting some support, it was not safe to jump into conclusion that management was therefore doing its job well. This is so because employees in the first question had indicated lack of clear understanding of what the standard is hence they would not know the exact support needed.

2. What other improvements do you want?

1 Quality must improve more.	**2** Improve product knowledge to juniors.	**3** Periodic checking of my work by the supervisors.	**4** Employ more people for less work on us and introduce more products.	**5** Oil spill from the press goes onto our clothes.
6 Work space is very small.	**7** Training to enable rotation, when others are absent work won't stop.	**8** More tools like clamps, bolts and nuts.	**9** Don't know.	**10** More communication management between workers and management.

- Nine employees who had something to say, expressed interest in more improvement on issues related to internal operations or their work environment.
- All items suggested for improvement were directly or indirectly related to ISO 9000.

3. Do you regularly get useful feedback from management?

1 Yes.	**2** Not really.	**3** Yes.	**4** Yes.	**5** No only QC officer.
6 Yes; a lot.	**7** Yes.	**8** Yes.	**9** Yes.	**10** Yes but not enough.

- Eight interviewees said yes.
- Number 5 interviewee who said no but contradicted himself saying it was only the supervisor giving him feedback. Number two interviewee who was the QC officer said not yet he participated in daily and weekly meetings with management.
- It therefore be positively claimed that some feedback was being given to all.

4. Are you given opportunities to develop?

1 Yes; management listens to suggestions.	**2** No.	**3** Yes.	**4** (Not applicable) is the one training others.	**5** Yes.
6 Yes.	**7** Yes; e.g. rotation.	**8** Yes; learning machining.	**9** Too many opportunities.	**10** Not much.

- Eight employees said yes.
- The QC officer said no even though he had been handpicked for promotion without any qualification. He struggled to know how to complete an NCR form even after being taught by the assistant engineer for a couple of months. Battling with such simple procedures made it difficult to train him some computer skills and statistical methods which were needed for his job.
- Interviewee number 10 said no despite jumping the promotion queue from general hand to junior operator due to his press operation experience from previous job.

5. On a scale of 0-5 is ISO 9000 useful in terms of first offs and checking fixtures to product quality?

1 5/5; very helpful.	**2** 5/5; helps on quality for all.	**3** 5/5; every job I do will not come back for poor quality.	**4** 5/5; cannot fill a bin with wrong products.	**5** Yes; difficult to work without.
6 5/5.	**7** 5/5; e.g. first and last-offs.	**8** 5/5.	**9** 5/5.	**10** 3/5; can't give it 100%.

- Everyone gave the standard 5/5 citing improvement initiatives such as first off signing and checking fixtures. Even though they said it in different words they agreed that their work was now much easier and got more control of product quality.

4.4 Company records

There was a challenge due to the fact that the previous management did not keep any meaningful human resource related data such as career planning and development, training records, performance appraisal and disciplinary documents. This situation meant that meaningful projection of human behavior change was going to be difficult to extrapolate.
Data used below was recorded during new management's time.

Tables (3 to 5) below generated from Appendix 19, show the total number of NCRs before, during and after implementation collected from Laursens company records.

Table 3. Total NCRs before implementation (Before August 2012)

TOTAL NON-CONFORMANCES			
		QTY	Cost
TOTAL INTERNAL NCR		None	-
TOTAL CUSTOMER NCR		None	-
TOTAL SUPPLIER NCR		None	-

Table 4. Total NCRs during implementation (August 2012-June 2013)

TOTAL NON-CONFORMANCES			
		QTY	Cost
TOTAL INTERNAL NCR		17	-
TOTAL CUSTOMER NCR		2	-
TOTAL SUPPLIER NCR		8	-

Table 5. Total NCRs after implementation (After June 2013)

TOTAL NON-CONFORMANCES			
		QTY	Cost
TOTAL INTERNAL NCR		10	-
TOTAL CUSTOMER NCR		0	-
TOTAL SUPPLIER NCR		5	-

From the results above, it can be clearly seen that before implementation began no NCRs were being recorded. Lack of NCR recordings in Table 3, was not because the SME was complying with standard. It was simply because of no system in place to record non-conformances

A combined graphical presentation of results in the three tables above was done in Figure 21 below. From the graph it could be seen that internal NCRs were highest during and after implementation.

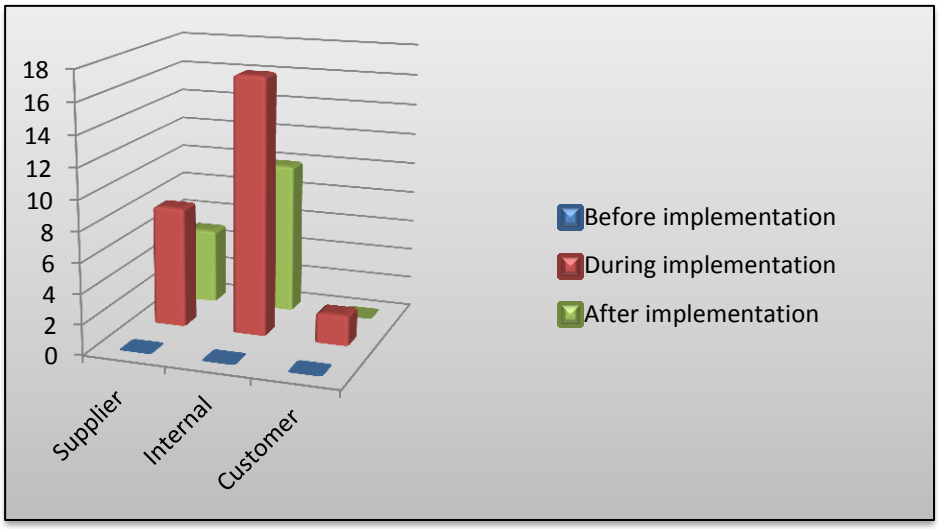


Figure 21: Total Different NCRs recorded.

4.4.1 NCR and quality management process ownership

Figure 23 below was generated from Appendix 20 and shows that as from February 2013 to October 2013, less NCRs were being recorded. The most NCRs were recorded around the beginning of 2013 and the trend was showing signs of going up again towards end of the same year.

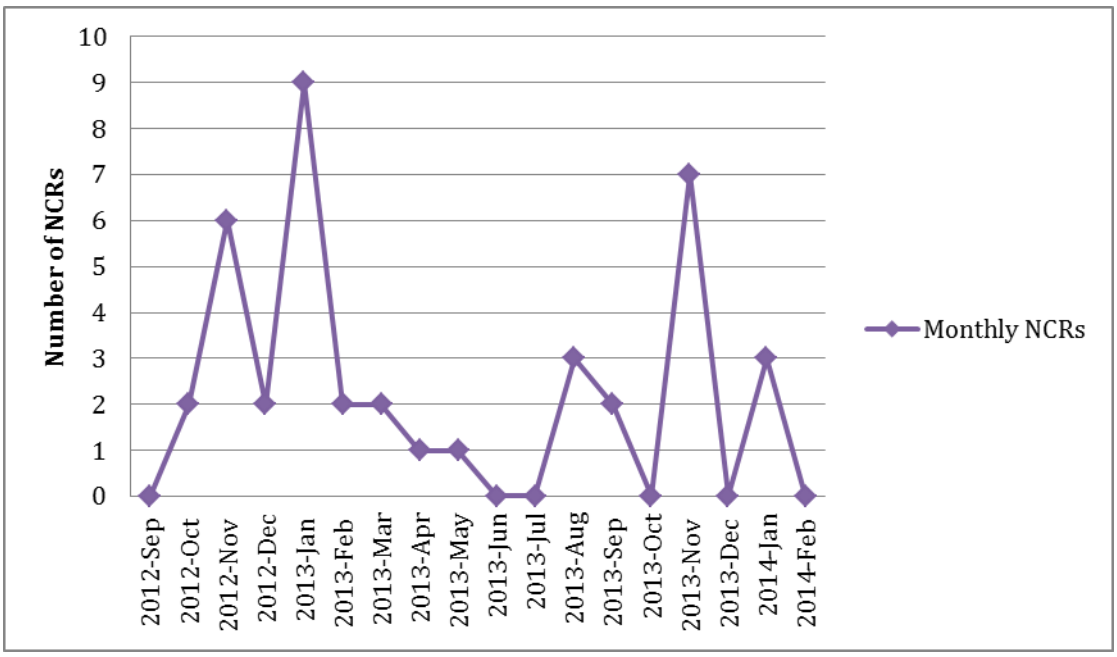


Figure 22: Total Number of NCRs

4.4.2 NCR turnaround time

From Figure 23 below, it can be seen that during the beginning of the standard implementation, NCRs were taking longer to be closed with most of them taking close to three months. However, the trend showed continuous improvement in NCR turnaround time. The downward trend of time to close an NCR seemed to also coincide with reduction in total NCRs recorded as shown in Figure 22 above.

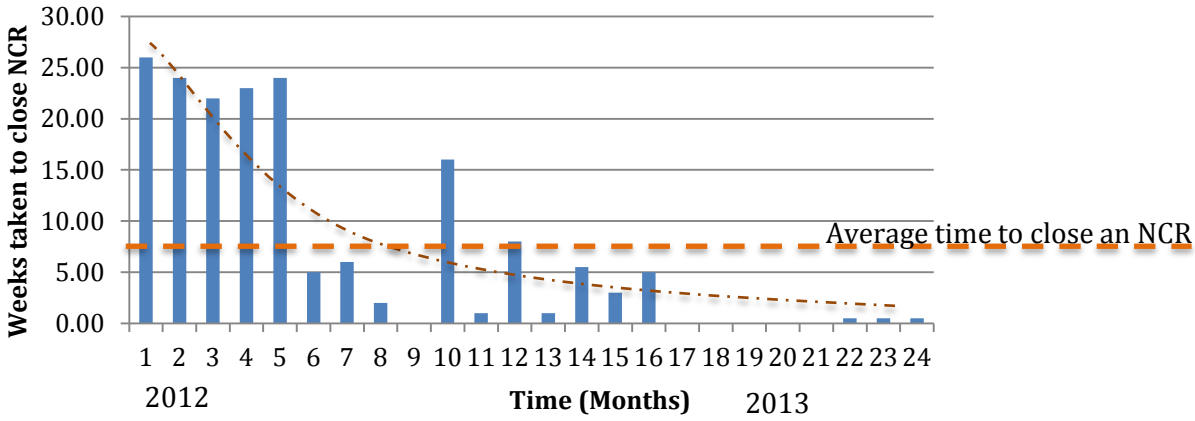


Figure 23: Time it took to close NCRs

4.4.3 Supplier impact to Quality

On a month-to-month basis, it appears that some suppliers were not improving their product quality as shown in Figure 24 below. The graph below could have shown a steeper gradient had it not been that the SME sometimes fixed some of the non-conforming products when under pressure to meet customer orders.

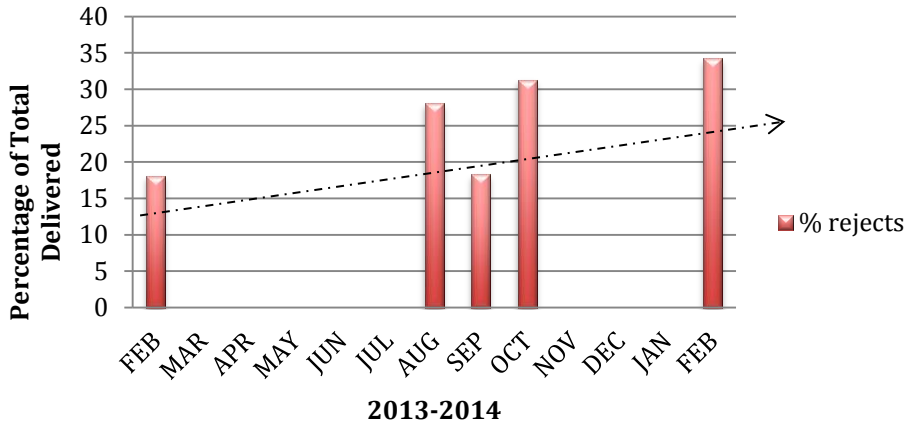


Figure 24: Monthly Supplier Reject Rate

As shown in Figure 25 below, one supplier kept on supplying cast hinges (CSLB) with porosity and sand inclusions without doing any pre-delivery inspections (PDI) as had been advised by the SME through supplier non-conformance reports.

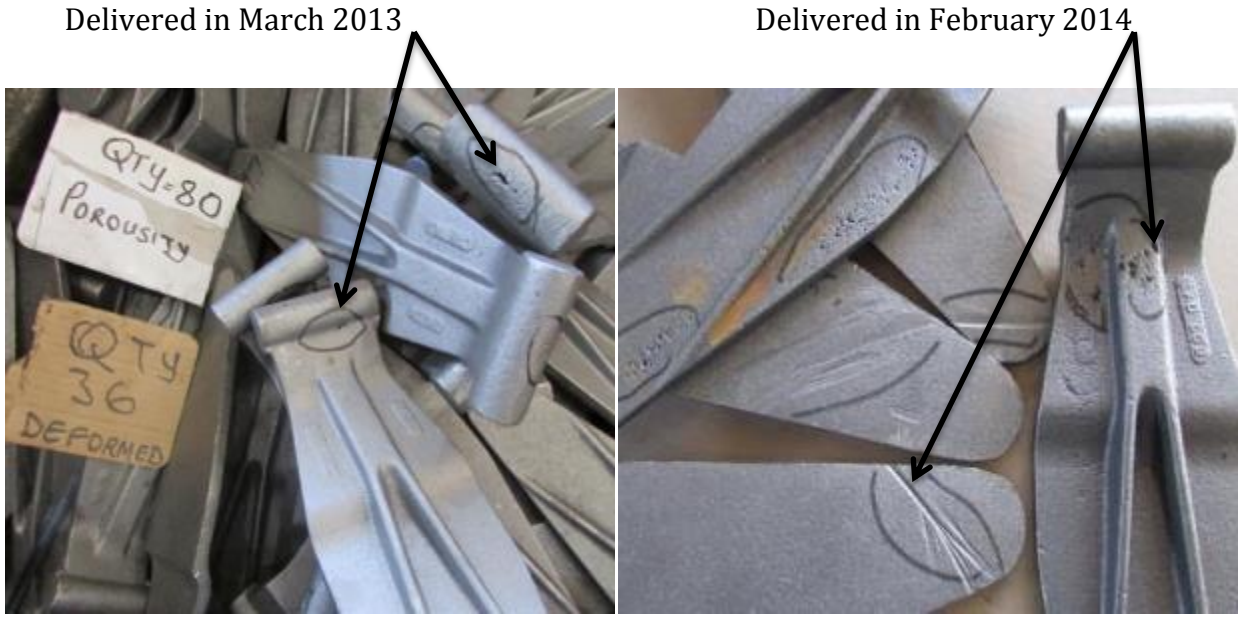


Figure 25: Products Supplied Without Pre-delivery Inspection (Laursens2014)

Even though this situation impacted on the company's operations through time wasted sorting the material, paperwork, storage and sending back the rejects, management could not control the supplier's behavior to sort out rejects before delivery.

Observation results

Introduction

Observations were done to reveal some specific phenomena in the SME, before, during and after implementation of the QMS. The people involved in the implementation process participated differently and at different stages as shown by the shaded boxes in Table 6below, hence impacted differently to the implementation process.

Table 6: Participation at Different Stages of People Involved

	Different stages of ISO 9000 implementation			
People involved	Before	During	Audit	After
Owner				
Operations manager				
Assistant engineer				
Supervisor				
QC officer				
General employees				
Consultant				
Auditor				

Some of the key observations made and used in this section are recorded in the appendices section from Appendix 1 to14. The attributes which were specifically observed under each of the components were stated in Table 8 below. The attributes observed were drawn from various elements seen to contribute to construction of the theoretical framework in Figure 14 under literature review. The researcher intended to take a closer look at what other scholars had observed or discovered in their works which is related to human factors and implementation of ISO 9000.

Again, since this was a longitudinal study of a single case, the results analysis approach seen as most appropriate a systematic separation and tracking of events from before down to after implementation as shown in Table 7 below.

Table 7: Observation Attributes

Attributes to be observed	Observation stage		
General	**Before**	**During**	**After**
State of the SME before implementation began	x		
Economic environment	x		
Organization culture	x		
Management Non-conformances	x		
Measurement systems	x	x	x
Management and supervision decision making process		x	
External human factors		x	x
Consultant influence		x	
Auditor impact		x	
Management			
Motive for implementation	x		
Employee engagement	x	x	
Launching of the project	x		
Management representative factor	x	x	x
Leadership factors	x	x	x
Administration of NCRs		x	
Appointing of Quality Assurance officer		x	
Measurement system and employee empowerment			x
Employees			
Employees' knowledge of the standard	x		
Relations with management	x	x	x
Employee preparation		x	
Level of employee involvement		x	
Resistance to change		x	
Internal training		x	
Teamwork		x	
Improvement in employee competence		x	x
Appreciation of ISO 9000 system			x
Relations within the organization	x	x	x
Attitude towards the standard			x

Section 1. Observations before implementation

4.5 General observations for whole SME

4.5.1 State of the SME before implementation began

When new owners and management took over some employees saw this as a sign that the company was not doing well and could close soon. This made employees to view any developments with some cynicism that it would not work.

However, as observed in Appendix 7, the new management convinced employees that the company was still going forward through:

- Investment in new machinery.
- Re-grading of people according to statutory regulations.
- Frequent meetings with employees to hear their grievances.
- Senior employees admitted that new management was more approachable and genuine in engaging with employees compared to the previous management.
- Spending money on things which seemed petty such as safety clothing; servicing machinery for safe operation; training first aiders and basic fire fighters.

New changes above enabled management to get some level of co-operation from employees.

4.5.2 Economic environment

Even though most senior employees did not show much interest in some of the new developments since they were now more interested with their retirement, younger employees were thrilled because they saw themselves and the company having a future together.

A frustrating issue with the younger employees' situation was that the company had not made most of them permanently employed resulting in some constant anxiety of not knowing how long one will last in the company. It was difficult for the company to give casual employees permanent employment due to uncertainty in the SA economy. As a result long term human resource planning was difficult since the company did not know for how long they will be with the company.

4.5.3 Organization culture

To avoid any issues of discrimination during laying-off of extra staff, there was a verbally agreed policy that the last employee to come in was the first to go. This meant that when laying-off extra staff even if someone had been very committed and teachable to learn new skills, they would still be let go if they were the last to come in. Some employees, who joined the company earlier, displayed a lot of complacency since they knew that they were not the last ones in hence will not be laid off first. A situation as this demotivated other hardworking employees.

The same principle was used to make people permanent or for promotion to trainee operators. On a number of occasions, employees with potential to be trained on skills which added value to the company were not the ones due to be made permanent. Again this created an attitude of mediocrity since no rewards were attached to performance.

4.5.4 Management of non-conformances

There was not even a sign of any formal system in place to deal with non-conforming products. Fixing of non-conformances was just through verbal communication with no recording of events for future reference.

4.5.5 Measurement system

There was no clearly agreed way of measuring product conformance to specifications. A lot of work-in-progress drawings were either outdated or missing to help employees check product quality during production. Each of the senior employees seemed to have their own criteria of passing or rejecting a product which confused junior employees. When the senior operators did not agree on product quality, it was a matter of who had the most influence since there was no common point of reference. Checking fixtures were there but scattered all over the workshop without any clear identification or registration of the ones in use and the ones pulled out. As a result, a lot of resource wastage was happening through time spend on reworks or total rejection of non-conforming material. This situation demoralized employees through blaming each other or when management rebuked them without giving them tools to achieve expected quality.

4.6 Management

4.6.1 Motive for implementation

The managing director made it clear that they were implementing the standard for the purpose of:

- Having some organized system to run the business.
- Convincing customers that they were a business with due diligence to its operations.
- Gaining a fair standing against already certified competitors.
- Clearly differentiating themselves from non-certified companies.

However, upon further observations, it was noted that some big customers for Laursens Engineering were also creating some domino effect on the supply chain through demanding that they wanted to deal with ISO 9000 certified companies.

4.6.2 Employee engagement

Workers got informed about implementation ISO 9000 a few weeks after implementation had taken off as noted in Appendix 1. This somehow confused employees when they could

not understand what was happening, resulting in a negative signal being sent about their importance to the implementation project. The timing was, however, claimed to be good by management because they wanted to first understand how everyone fits in before involving them. After the launch, leadership informed employees on a weekly basis of implementation progress and what was expected from them even welcoming comments and objections about new developments.

During this implementation period, the company was also at its peak on orders. There was therefore not much time given to do enough briefing to employees on what ISO 9000 was about. The implementation process thus progressed with some employees not having been given enough education on what ISO 9000 means.

4.6.3 Launching of the project

As indicated in Appendix 1, employees were not given clear specifics as individuals or departments on how they were to contribute to make the implementation success. Management generally focused on where they wanted the whole company to be in general without clarity on what individual employees should do for the company to get there.

4.6.4 Management representative selection

The SME had two people to choose from, the managing director and the production manager as noted in Appendix 1. The managing director was getting busy with other commitments leaving the production manager (who had been his junior manager at their previous employment) as the only choice. There were no other people with leadership experience and qualifications close enough to the responsibilities of this role.

The manager did not have ample time to effectively concentrate on the new duties since he was already under pressure due to the MD's frequent absence.

Appointment of the production manager who then became management representative seemed to be based more on loyalty and trust gained through previous employment relationships and not much on competence. This was a genuine dilemma for the owner due to the SME's size in that it is not easy to bring in a competent manager (who is a stranger) and just promise to give them some big benefits when business had grown. The advantage of bringing in friends was that there was some guaranteed level of commitment due to some pre-existing relationship.

4.6.5 Management representative's change management experience

The management representative had a sound technical understanding of quality systems such as ISO 9000 and Lean manufacturing from previous work experience at a big organization. The challenge was to move from understanding technical issues involved with ISO 9000 basing on one's streamlined activities in a big company to taking all the responsibility in a small company with minimum division of labor. The impact of the management representative's lack of experience was however not so severe due to his close working relationship with the MD who had change management experience.

4.6.6 Consultant selection

The selection of the consultant was one of the areas where the MD, who had educational qualifications and experience to run the business, made the difference. The owner and outgoing MD, a qualified engineer by profession showed good understanding of the standard and awareness of how different consultants worked. He had a clear understanding of what he wanted in a consultant. The M.D had already made it clear that they wanted to implement the standard for improvement of current operations and marketing purposes. The company thus looked for a consultant who would not try to absolutely convert the company from its way of operation but one who could help them from where they were going forward. He thus hired an optimistic ISO 9000 consultant who was a qualified industrial psychologist and certified auditor with a good track record.

4.7 Employees

4.7.1 Employees' knowledge of the standard

From casual conversations before implementation started, the majority of the employees clearly did not know anything significant about ISO 9000. For most employees, Laursens Engineering was their first employment hence the lack of exposure to any quality standards.

4.7.2 Relations with management

From a simple initiative of holding weekly general meetings with employees on various issues of concern to employees which previous management was not doing, relations with employees started on a promising note. As noted earlier on the section of "The state of the SME before implementation began", level of trust between management and employees

considerably improved after management had clearly demonstrated its commitment to see the company going forward.

4.7.3 Employee competence/skills

Other than the tool room supervisor and two young welders, all other employees had no formal training done after matric. The other welders and press operators came through in-house training as assistants eventually graduating to senior level.

Section 2. Observations during implementation

4.8 General for whole SME

4.8.1 Management and supervision decision making process

Multi-tasking and prioritization abilities were a challenge. It was difficult to manage at the same time tasks which were so disjointed such as attending to machine breakdowns, ordering of spares, monitoring product quality and giving authorization before each operation started. Employees got disappointed to wait for a long period just to be given a go ahead even on tasks they thought to be very simple. This at times was due to conflict in prioritization of tasks by management and supervision for instance with daily quality meetings as explained below.

- Supervision felt that the first thing they must do in the morning was to assign work to their people so that the people will not be idle as they attended daily meetings. Constantly, some people would come and disturb the meeting to clarify on their assigned tasks. Some of the employees could be seen loitering around waiting for supervisors to finish their daily meetings.
- Management wanted to do the daily quality and production meetings first thing in the morning. This helped them to follow up on outstanding issues early enough before they could attend to office duties or leave office to visit customers. It also helped them with feedback to customers who could phone early in the morning following up on their orders. It was going to be disappointing for the customer to realize the manager doesn't know about their order's progress, hence, they wanted updated information first thing in the morning. Delivery schedules for the day were also easy to make when there was timely feedback about completed orders in the workshop.

4.9 Management

4.9.1 Management representative impact

The representative brought in all the qualities of a manager mentioned in Table 2 because of him being more of a manager than a leader. His leadership style was more of a benevolent leader which helped him to quickly gain acceptance when he joined the company just before implementation started. He balanced well motivating people to be productive and teaching them to manage their safety. Such a character attribute helped with motivating some employees when they saw that he cared about their wellbeing.

The management representative, however, had challenges to multi-task from: production planning and management, quality management, attending to employee needs, ordering spares and consumables down to attending customer complaints. This was a difficult schedule which in big companies would have been performed by different departments or people. Influence of the management representative was therefore not very consistent since at times there were urgent day-to-day business management problems which threatened meeting the needs of customers. This situation was at times not interpreted well by some employees in the company as explained in cases below:

- Employees would feel neglected or that management itself was less interested in the standard when simple decisions took time to be implemented. When management behaved as if ISO 9000 was not one of their top priorities, some employees saw no need of straining themself to attain it.
- The former MD (owner) was no longer directly involved with day-to-day running of the company but was still quite influential behind the scene. Trust from employees was affected since they felt he was there to please the owner at all costs. This was witnessed by some lack of decisiveness on issues employees thought were simple which in turn delayed some activities and caused people to work under pressure when decisions were finally made.

4.9.2 Management support

Management support was good enough to gain certification but not at its best for significant organization transformation. A trainee supervisor, who later on suddenly resigned, had few occasions where he complained of how the management representative slowed things down. Immediately after joining the company, many people appreciated the trainee's zeal and desire to see the company being transformed. When it came to final passing of decisions by

the MD, momentum and enthusiasm gained was lost due to a lot of procrastination. It was not clear whether the problem of delays in decisions was due to his lack of confidence or fear to make decisions without approval of the owner who was not usually on site.

Procrastination in making decisions was not only limited to internal matters; there was also delay in communicating non-conformance information to suppliers. At times material with similar non-conformances would be delivered for the second or third time with the first case still not communicated to the supplier. Employees were again frustrated to see nothing changing when they had done everything required from their side.

4.9.3 Daily and weekly quality and production meetings

Originally, the company was only doing weekly production and quality meetings for general updating and planning ahead. Management realized that by the time these meetings were done, it was already too late to effectively react to some problems which could have happened earlier. As a result, the weekly meetings' agenda became blurred by reactions to accumulated problems instead of being proactive. The quality, tool setting, maintenance and production departments were also having a conflict of interest and communication breakdown as illustrated below:

- Tool setters could load tools not urgently needed onto presses when urgent ones were waiting.
- On the day of starting certain production activities tool setters could suddenly realize the tool was broken and not ready for work.
- Production would plan to do certain operations when tools for those operations were needed into the tool room for maintenance.
- There was no constant feedback from maintenance department on progress of tools being repaired.
- People were working in some sort of departmental silos, separated from each other by the bureaucratic system of everything passing through management first. There was no general platform for leaders across departments to discuss and exchange ideas to solve work problems.

To try and solve these problems, daily quality and production meetings were implemented early in the morning to complement the weekly meetings as illustrated in Figure26below. The meetings enabled the SME timely reaction to problems as well as improved communication between different departments.

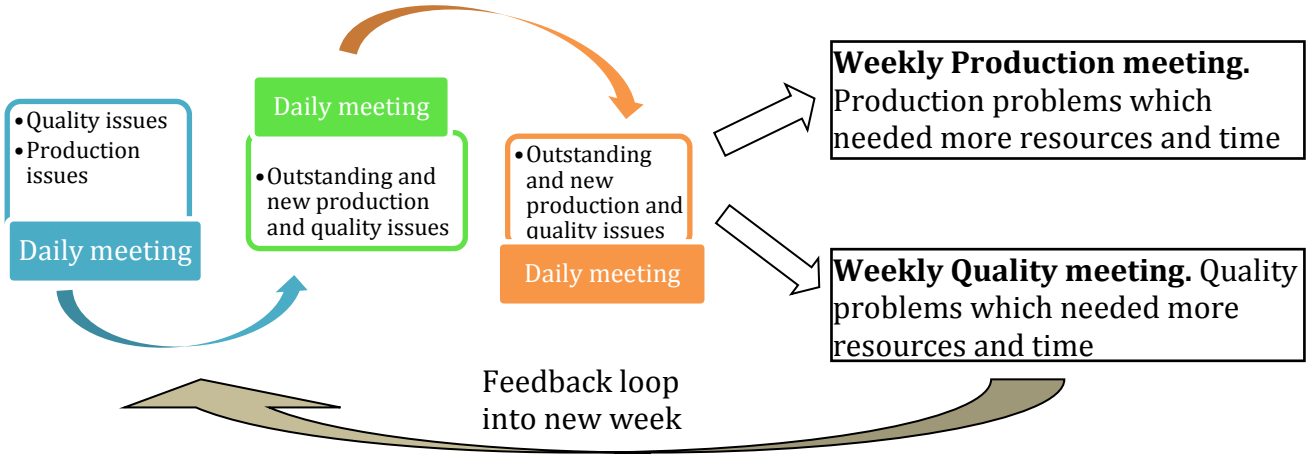


Figure 26: Integration of Daily and Weekly Meetings

These daily meetings were to take less than 10 minutes. These meetings started at 8 am, 30 minutes after starting work to give supervisors time to delegate duties, however early enough for management to get the daily update they wanted.

4.9.4 Interdepartmental accountability

From the discussions during daily and weekly production and quality meetings, the issue of no effective tool maintenance system kept on coming up. By end of February 2013, this resulted in implementation of a tool maintenance whiteboard, shown in a Figure 27 below. Even though this new development was not totally disregarded, there was a lot of passive resistance. No one openly opposed the idea since the owner was very excited about it but no one showed great zeal for it to succeed as well. This resistance which mainly came from the involved people, who were the toolmaker and tool room supervisor, understudy production supervisor and production manager, seemed to be caused by:

- The toolmaker had not been used to work with written planned schedules. Usually things were just verbally agreed on and when changes were made nothing was noted down. Effectiveness of the tool room department was therefore difficult since there was nothing to look at for evaluation. Use of the whiteboard meant leadership could easily see tasks that had been outstanding for a long time resulting in pressure for the tool room.
- For the production department, whiteboards meant they had to explain why a tool due for maintenance was still in production. This meant a lot of pressure to do

effective planning and time management so that the tool maintenance department would not blame them for holding on to tools.



Figure 27: Tool Maintenance White Board (Laursens 2013)

Passive resistance was shown through lack of interest to attend the meetings. The understudy supervisor who was championing the initiative left with the idea not having fully taken off.

This initiative had to be suddenly dropped. It was only pursued again months later in 2014 when a product developed engineer joined the company. Similar kind of resistance was again being witnessed but management was now paying close attention to support the young engineer.

4.9.5 Evaluation criteria for employee competence

There was no empirically defined procedure to measure employee competence. Log sheets were used to record amount of time an employee operated or manufactured a product as in Appendix 29. The trainees were rotated to another operation once the stipulated hours had been completed. The supervisor and production manager constantly discussed performance of the trainees if they were maturing or not.

The challenge, however, was that these operations which trainees were being exposed to were determined by what was on the order book. The SME ended up having a situation where employees were over exposed to one operation till they fully mastered it while being under exposed to another operation whose products were not in demand. When the slow moving product was eventually ordered, at times it will be so urgent such that the supervisor avoided taking chances and simply placed experienced operators on the job.

The evaluation criterion was however seen as fair by employees. To add validity to the assessment criteria, for rating employees' performance, three people were involved as shown in the employee skills matrix in Appendix 27. The engineer was involved to do the first run independently, the supervisor or manager then checked to see if they agreed with the results. To make the results more authentic, a representative for workers was also invited to assess the results and query what he did not agree with. All the three signatures were supposed to be there for the skills matrix to be acceptable.

4.9.6 Administration of Non-conformance Reports (NCR)

During the launching of NCRs, there was a challenge of consistency in terms of the criteria being used to determine if an incident warranted recording an NCR or not. From previous management, there had been no official NCRs. The mere issue of recording NCRs made some employees to think that management wanted to keep a record of their failures. The Production supervisor and QC officer were hesitant to report cases which were supposed to be recorded as they feared to be labeled as sellouts. As a result, a lot of non-conformances were repeated or discovered at a later stage due to this secretive attitude.

Upon realizing that the people thought NCR s were being raised against a person and not a process, management had to embark on educating people that they made NCRs against the process not people. People were only involved because the process could not run on its own. Further, it had to be emphasized that when one person made a mistake, it simply meant he was the one who had the opportunity or has been in the conditions where the mistake could happen. This therefore did not have a direct relation to that person's capabilities compared to others who would not have had the opportunity but were also capable to make a similar mistake.

Another reason which gave problems to recording of NCRs was lack of measurement tools which could be easily used to separate bad products from good ones. A lot of what was being used was bare human judgment which obviously depended on the person abilities on that day.

4.9.7 Appointing of Quality Assurance officer

Management realized that there was poor repeatability of product quality when different people made the same product or even from the same operator at different times. It was difficult for the workshop supervisor to oversee production and quality issues at the same

time. Upon further observation, management also noted that each operator had areas of specialty which was also directly related to years of experience and exposure.
Previous management had also not been actively rotating people. This resulted in some senior employees to be experts for very few operations despite being with the company for a long time.

The challenge was that not every production task was performed every day meaning that machine operators had to be able to perform different tasks for the day. Under such circumstances, when the supervisor was not there operators had to get support from the one senior operator who knew almost every product and press operation. With increase in inspection of incoming goods, the senior operator who also worked as goods receiving clerk was beginning to complain of being tossed around from one duty to another and being made to task outside his job description.

Attributes considered for the appointment of the quality officer were that he had knowledge of how different products were made in the company even though he had no formal education on quality systems. The QC officer was thus chosen on the basis of his experience with the company and nothing more.

4.9.8 Introduction of first-off signing

During solving of most non-conformances, management realized that there was poor process ownership. Almost every time there was poor product quality and management asked an operator why he proceeded to make non-conforming products, the operator would simply say he was told to proceed or the tool setter told him that the press was ready for work. On the other side, the supervisor or QC officer would say they were never shown the product since they were busy elsewhere. From this experience, management realized that:

- Wastage was happening in terms of rejects thrown away, time spent reworking on rejects, time spent recalling the tool setter from another job to come and reset the press.
- At times this situation could spoil relations when people started blaming each other if the non-conformance was severe. This especially came from the fact that there was no evidence to show that the operator had indeed been instructed to continue or not.

There was therefore need for proof that there was communication and authorization from the right person for the operator to proceed. The only person authorized to give production a go ahead was the QC officer. The QC officer was given stickers as below in Figure 28below

to put on the first product passed and the operator was expected to continue making similar products.



Figure 28: First-off Signing Example (Laursens 2013)

Using procedure for first off signing as above helped each employee to take responsibility but full process ownership was still a challenge till the introduction of checking fixtures.

4.9.9 Introduction of checking fixture (Go/no go gauges)

It was also observed that after doing the first off signing and instructing the operator to proceed, during production, the process could get out of control and start producing non-conforming products. It was not going to be helpful to give the operator some product drawings and measuring tools to check product conformance because of the nature of the SME's production operations. The SME made high volume repeated products which made it difficult to stop after each and every single item to take measurements and compare with what is on the drawing. This situation presented challenges below for all people.

- Operators were demoralized and lost confidence when they were expected to make good quality products at the same time turning out high product volumes.
- The QC officer and production supervisor could not be at each every workstation to make sure employees were making the quality products.
- Even if management had issued drawings and measuring tools, the general low literacy levels of most employees made it difficult for this to be successful.

There was need for something to help the operators to constantly check the quality of their products with minimum delay to production. The solution came in the form of checking fixtures such as the one shown in Figure 29 below.

Production was to stop if either the item loosely fitted or failed to fit into the fixture



Figure 29: Checking Fixtures (Laursens2013)

Checking fixtures had existed since the previous management's days but were not being put into use. This was confirmed by the fact that even some of the senior operators did not know how to use some of these checking fixtures.

4.9.10 Introduction of workshop Dos and don'ts

Management also realized that there was little repeatability of quality standards when a junior operator performed an operation usually done by a senior operator. The main reason for the above situation was said to be due to little cross-pollination of skills form senior to junior operators. Even if junior employees were encouraged to learn from the senior operators, this was not effective in that the seniors were usually under pressure to afford enough time for that.

Another challenge was that the senior employees themselves, especially welders, had no agreed approach to most operations. The juniors were thus confused by contradicting approaches to work by their seniors. As a result collective team learning became almost impossible. There was therefore looming danger that one day the SME would fail to perform some of its operation when the senior employees retire. To attend to this imminent danger, management decided to document each and every production operation activity.

Management achieved this strategy through introduction of Production dos and don'ts as the sample shown in Appendix 31, which intensely used pictures and short work instructions on what the operator must and must not do. As shown in Figure 30 below, these Production dos

and don’ts were made very short and placed at a convenient place where the operator could simply lookup to confirm a procedure without even leaving their workstation.



Figure 30: A Typical Whiteboard for Production Dos and Don'ts (Laursens 2013)

4.9.11 Timing of introducing new systems

The company owner made a policy that if there was a non-conformance, work instructions must be drafted and employees must sign within 24 hours. The intention of doing this was to show employees the right way of doing things when they could still remember the incident. At times the assistant engineer who was mostly involved in drafting these documents battled to meet the deadlines with any useable document especially for complex operations. It became a common sight that documents could be released into the workshop and pulled out the same day for further editions which in a way confused employees.

Since all the production dos and don’ts released into the workshop had to be signed by employees as per ISO 9000 recommendation, when hurried implemented some employees received them with suspicion. Group resistance which happened to signing of the quality commitment document in Appendix 28 was a one of the clear signs of resistance to change due to poor timing by management. The document was drafted and given for employees to sign soon after some series of non-conformances had happened which caused suspicion that management had ulterior motives. It then took a lot of time and effort to convince employees that management just wanted them to show their commitment by signing the document.

4.9.12 Understanding of the customer needs

This was one of the situations where the SME had to think and go beyond what ISO 9000 was offering. It was not easy to determine the SME's level of customer understanding. There was no marketing department or a sales team from where the company could get feedback on how they were performing on the market. What was clear was that they were one of the most expensive suppliers in their product range and they strived to justify their prices by supplying high quality products.

The only tool from ISO 9000 to use for customer understanding was the customer surveys. However through customer surveys, one of the helpful insights management received was that customers wanted reduction in lead times. It was good for the customer to openly tell management how they wanted service to improve but it was not that easy. Management used the cause and effect diagram in Figure 31 below to reveal how lead times were getting to be that long.

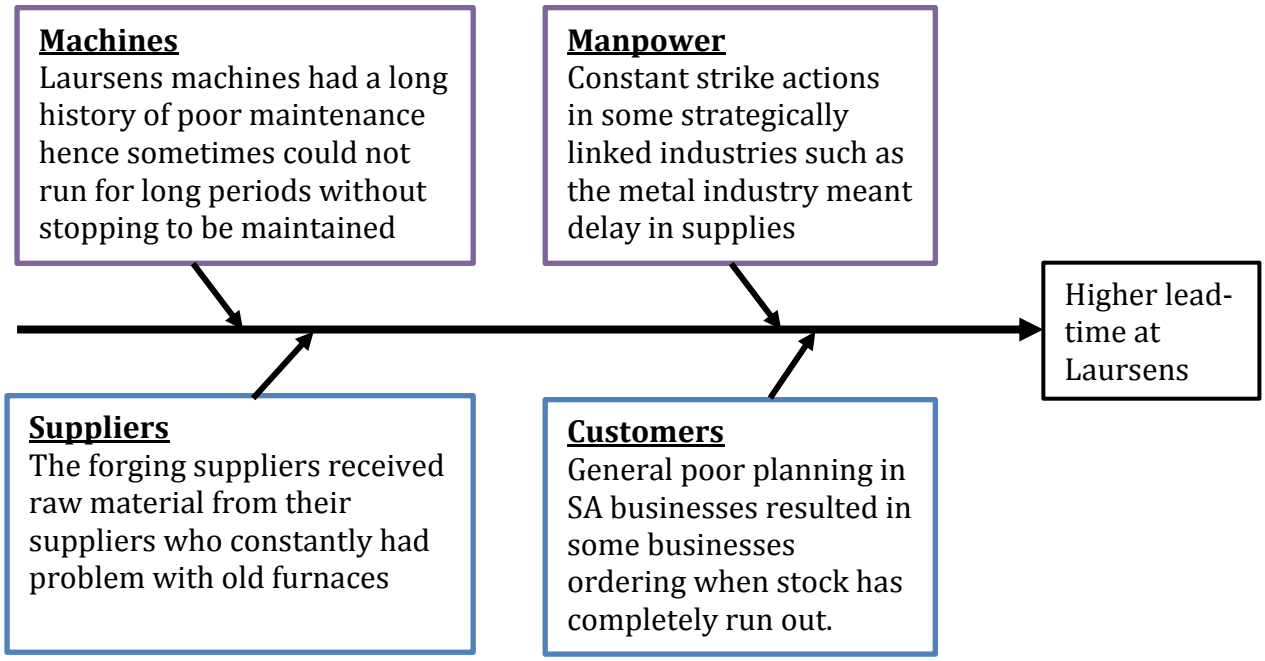


Figure 31: Causes for Long Lead times

Laursens had minimum or no control of the problems above. Even though they strived to implement planned maintenance systems for their machinery and tools, this at times simply further complicated things. Due to the long history of poor tool maintenance when some tools were due for their planned maintenance, another tool which was supposed to be serviced week later would break down during use. Such a tool had to be rushed to the tool room for maintenance which meant putting all other tools being maintained on hold. By the time the maintenance team completed repairing the broken tool, those other tools still being

serviced will be now also be in demand for production. This situation caused unending pressure on the tool room. Frequently, the tool room people blamed management for poor planning and not knowing exactly what they wanted by constantly changing prioritization of equipment due for service.

From analysis on the cause and effect diagram above, management realized that their production planning system in Figure 32 below could not cope with the frequent disturbances from above problems.

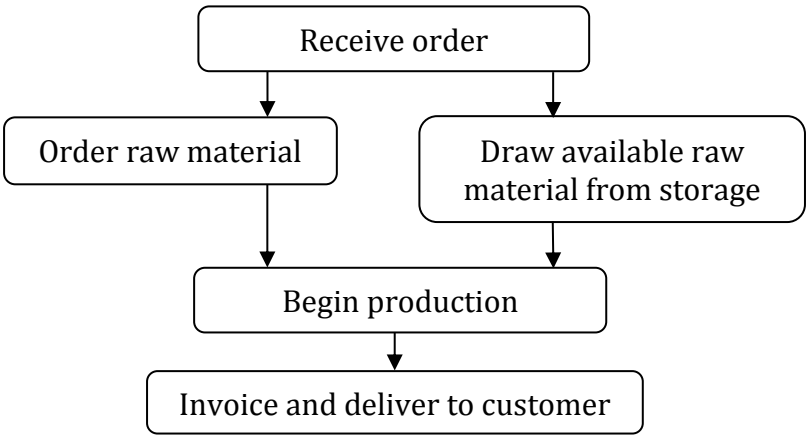


Figure 32: Old Make-to-order Production Planning System

New production philosophy

Having realized that the ordering system above was making them to be always lagging behind, management took note of the following:

- They could not force customers to improve their planning order early enough.
- One of their competitive edges was better response to changing customer needs.
- Suppliers had minimum chances to improve delivery time since they were also complaining of delays by their suppliers.
- The company manufactures standard and repeated products which can be stocked without losing value.

Management then sought to deal with the above situation by dealing with what was within their control through changing what triggered raw material ordering as per approach in Figure 33 below. Production planning philosophy was transformed from make-to-order to make-to-stock.

The new system had its advantages and disadvantages as shown below.

Challenges were the need for good demand forecasting from management or else there was risk of

- Too much capital being tied up in finished goods or
- Lost business opportunity or even customers due to failure to deliver on time.

The system came at a price through creating need for constant stock takes and tying up capital but had lots of advantages which included:

- The company was still in the process of moving from QC to QA hence they had the time to fix slip ups on non-conforming products which got to the end without meeting customer specifications.
- Moral and stability in the workforce was enhanced by removing anxiety from frequently hiring and laying off casual employees to match demand changes.
- Continuous improvement became much easier as people were not always fire-fighting to quickly deliver orders.

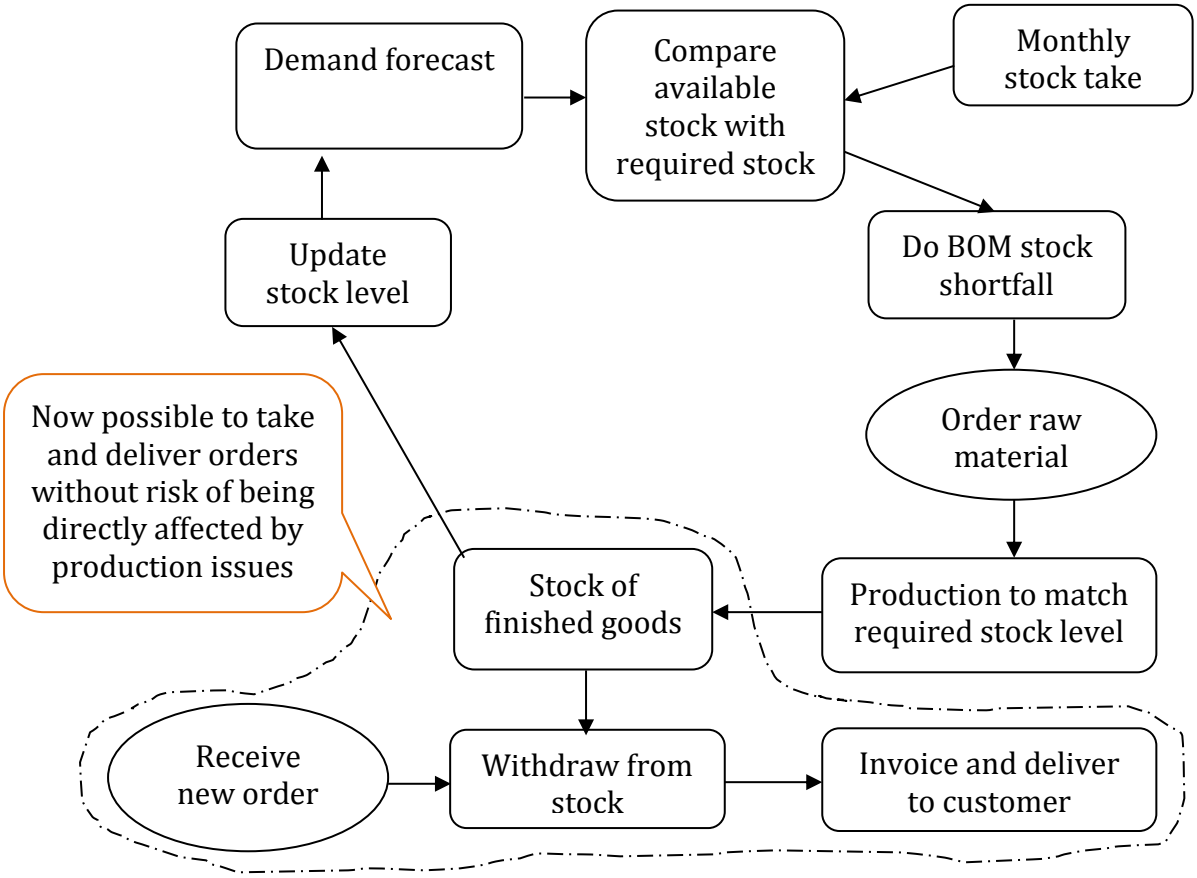


Figure 33: New Make-to-stock Production Planning System

- Consistent timely deliveries as well as reduced lead times, gave the SME a competitive edge.
- Moral improved from maintenance to production and QC departments since the pressure due to unpredictable orders was cut off. There was now less shunting of people from one urgent task to another more urgent task.

The resistance which was almost going to spoil implementation of ISO 9000 was thus enormously suppressed since both management and employees benefited from this new strategy.

To confirm benefits of this strategy, Figure 21 showed that customer NCRs went down despite monthly supplier con-conformances remaining high as shown in Figure 24.

4.10 Employees

4.10.1 Employee preparation

Implementation process started with the employees not having been told of how they may be affected individually through changes such as increased workload, paperwork and strict recording of all non-conformances.

During early days of implementation, the researcher witnessed stiff resistance from the senior operator who other than operating his own press had extra duties of receiving goods and mentoring junior operators. No evaluation of increase in work load for this employee had been done as well as clarification of his grading. The employee used to do some quality control duties partially or for some selected goods being received. Due to inconsistence in quality of incoming raw material, he was now expected to check everything coming. The employee ended up complaining that he was doing more than his job description. Management had to quickly convene a meeting to solve this problem eventually making him fulltime Quality control officer.

4.10.2 Level of employee involvement

The employees in the company where not multi-skilled and qualified enough to productively participate in some of the implementation activities. For example completion of the NCR forms needed someone to have a systematic understanding of the cause and effect relationship of events which lead to the non-conformance. It was risky to ignorantly fill in NCR forms because in worst case scenario, this could do more harm than good.

Employee involvement however, increased with time as employees were getting more confident after being equipped with tools to work with such as checking fixtures and production dos and don’ts.

4.10.3 Resistance to change

Most resistance to change happened during implementation. The resistance to change did not culminate into anything serious such as people protesting against the standard but was mainly passive resistance or lack of interest in new changes. This resistance to change was at various levels as illustrated below.

Individual level

When first off signing was introduced, some operators kept on starting production without the QC officer's approval. They claimed that they had done the job long enough such that they did not need anyone's approval.

During introduction of the dos and don'ts resistance by individual employees also occurred. Some older employees disliked the idea of reading the instructions even though it took just about a minute. The employees argued that they had been doing the same operation for years and yet never had any quality problems with customers. On the other hand, some argued that it slowed them down to go through work instructions before every new operation.

Even though they had a case for an argument, still the new developments were necessary because:

- During old days when the SME could survive with poor quality products, globalization had not yet become an issue as today. The workshop supervisor whom the researcher spoke to claimed that supply capacity was usually always lagging behind product demand because of fewer suppliers. The customer therefore had to cope with some of the substandard products delivered since the supplier was the king due to market monopolization.
- Another reason which created the need for Dos and Don'ts was that some suppliers' standards were not consistent. Due to general economic challenges experienced in the country, expensive suppliers who normally supplied better products were dropped for cheaper suppliers who struggled to consistently meet expected product quality. These new developments were thus introduced to help cut off non-conforming products right from the beginning.
- Management could also not buy into the claim that the constantly reading dos and don'ts delayed production. This came from the fact that, previously, people would spend almost the whole day making substandard products without anyone checking conformance to standards. As a result, people frequently discovered after a full day of production that they were busy making rejects. Management was thus ready to delay production with a few minutes rather that to hurriedly waste resources.

Individual resistance was also observed along racial lines during disciplinary procedures between employees and management as some employees interpreted it as mere victimization or discrimination.

Group level

ISO 9000 brought an increase in management involvement into daily activities of the workshop, especially in the early stages when new work procedures were being implemented. This made employees to be suspicious of management's intentions such that at times, it was mistaken for management trying to spy or hunt down some people.

Group resistance also came from senior employees which almost caused harm to the outcome of ISO 9000 implementation. Most of the operations done at Laursens Engineering were fairly complex but not to the extent that an ordinary man could not be trained up to a competent level within a few months. The previous owners did not take much interest in cross training of people resulting in employees staying for a very long time in a similar position. New management realized that this was part of the source of poor quality. For example when the only employee competent with a particular task was absent, another operator who would have been with the company for many years was not capable to perform the similar operation.

Management choose to cross train younger employees since they were going to be with the company for a longer period. Senior operators were disappointed when younger employees started getting training; some of them had not even been with the company for more than a year. Senior operators were used to people waiting for a long time before getting such an opportunity. It was not easy to suddenly be put in the same pay grade with a person almost young enough to be one's child and who joined the company a few months ago. What added to the frustration seemed to be the fact that most of the senior employees had reached a plateau in their careers where they could not go any further since they had mastered all their job content and SME's small structure.

Senior welders also resisted recording their daily production output shown in Appendix 28 for no explainable reasons. Originally people just worked without any measurement to know their work rates. Management then realized that for them to effectively plan production and give customers meaningful delivery dates, they had to be aware of how much time it took to make different products. This factor coupled with inconsistent work rates by some employees who on another day could simply double what they made the previous day, forced management to implement the new system. Trial runs were done and employees were invited to give comments on changes they wanted. When the decision was finally implemented, senior welders ignored it and continued as usual till management had to intervene.

Company level

The main resistance experienced at company level was breaking of inertia to start moving in the new direction. For example, management introduced a continuous improvement document as discussed in Appendix 4, upon realizing that during ad hoc meeting which employees held informally to fix problems, there were a lot of brilliant ideas which went unrecorded. At times, when a problem was fixed and the same challenges happened again, the people who collectively fixed the problem would have forgotten some of the key details.
In that document shown in Appendix 33, the supervisor or QC officer were supposed to take pictures and notes describing the problem; how it was fixed and any challenges still remaining. Despite having the forms, the camera and everything else; people dragged their feet to do this. Some of the continuous improvement initiatives thus, had to go unrecorded or were poorly recorded.

4.10.4 Internal training

As noted earlier after realizing that most of its experienced welders and operators will be going on retirement soon, management decided to start training younger people on all operations. The general hand (chippers) employees had also complained that they were not being given fair opportunities for learning new skills. This happened when two of them had been selected, one for training as a tool setter and the other as a press operator (interviewee 10 on internal interviews). It was a very challenging task for management since some of these general hand workers were not yet ready to be trained on more challenging tasks. These complains were also because management had broken the rule of giving opportunities to employees who came first since the selected trainee operator was still new. The selected trainee operator had worked on presses from his previous job thus had potential to quickly learn and adjust.

However, most of these employees had neither worked for the SME long enough to allow management to assess their different levels of competence to identify their training needs.
There was no clearly agreed way of measuring and distinguishing between an employee with potential to be taught better skills and one not yet ready for on job training hence the complain of how management was choosing people for training.
Management therefore had to risk its quality improvement program to train a bulk of its general hand employees.

4.10.5 Teamwork encouragement

Cooperation and teamwork was encouraged through training employees even on tasks not part of their duties. When employees were trained on duties either preceding or succeeding their specific tasks in the production line, there was improved communication. Internal customer-supplier relations improved since there was now, more understanding of what other teammates went through to accomplish their tasks and why they demanded products to be delivered to them in a certain state.

An example of improving internal customer-supplier relations happened between the welders and chippers. When there was no welding work, some welders were taken to the final preparation bay which is the chipping department to help prepare welded components for painting. After struggling to remove welding spats together with the chippers who always complained about it, they realized the importance of using anti-spat chemical to minimize welding spats.

4.11 Consultant influence

The consultant's approach to the whole implementation process was quite flexible allowing the implementation process to be more practical than a mere checklist ticking session. Sometimes when the management was under pressure to meet delivery commitments, they would simply email the consultant to postpone his weekly meeting by a day or so.

The consultant however had a challenge of only having generic understanding of the standard to make the company pass the audit but struggled to make sense with some manufacturing or engineering related issues such as welding specifications or different press maintenance procedures. Fortunately, the outgoing MD of the company had previous experiences from other companies and helped to tailor make the standard to suit the SME business environment.

One clear negative element also was that the consultant could request from the auditing organization (TÜV Rheinland), which auditor they preferred to do the audit. The researcher later on discovered that the consultant had previously worked with the selected auditor which created risk for undue influence.

4.12 Auditor impact

When the auditor came, some elements required by the standard were clearly not up to scratch. The auditor noticed some of these issues such as missing work-in-progress drawings for some products or incomplete work instructions. He did not use such minor

negative elements to fail the audit but said he was interested in overall positive transformation since it was the first audit. The auditor said as long as there was a system in place to eventually solve any of those shortcomings before the next audit, he would not raise in non-conformances. Management thus felt free to show the auditor everything confidently knowing they had achieved a lot of the standard's requirements.

Section 3. Observations after implementation

4.13 Whole organization

4.13.1 Management of non-conforming products

Non-conforming products, be it internal or external, at times took longer to process. There was delay in either communicating with involved employees or suppliers; observing the process to see if non-conformance had been dealt with; deciding whether to rework or reject the quarantined material.

After quarantining non-conforming material into quarantine bins, it took long to decide on the material resulting in even abuse of the bins as shown in the pictures in Figure 34 below. The delay to communicate or send back rejected raw material even resulted in confusing situations where the SME would make full payment of delivered goods only to start the tedious process of trying to recover costs on the next delivery.

Bin filled with clearly identified and separated material

Bin filled with different unidentified products



Figure 34: Proper and Improper use of Quarantine Bins (Laursens 2013)

By the time management visited the bins to decide on what to do with the material, it usually was very late for people to learn much from the experience. This was one of the areas where employees felt the management representative who was now the director was not able to make bold decisions on quality hence the delay waiting for the owner. After the QC officer had worked tirelessly to sort out material, he was frustrated to see no further action from management side for weeks or even months.

When leadership failed to show due diligence on visible matters such as this, a bad precedence was set to employees on respect of work procedures and desire to improve standards.

4.13.2 External human factors

Factors such as lack of good quality systems from some key suppliers and customers as well as political influence through unionization had an impact on the attitude and moral of the employees which in turn affected the implementation process. Employees were not pleased with demands for high quality standards from management when management was doing little for some suppliers to improve quality. Even after implementation of the standard, the QC officer had to inspect each and every item delivered on some products since the quality was so bad. Management however, dragged its feet in being hash to these suppliers due to good bargains for price or delivery dates.

The same challenge existed with some customers. Before the new management came in, there are a few customers whom the old management had high levels of trust with such that orders could be placed verbally with promise that paperwork will follow. Some of these customers even if they knew the SME's lead time for deliveries, they could demand urgent deliveries which made planning difficult.

The SME was handicapped to take decisive actions such as changing suppliers on the case of CSLB hinges. This was because the supplier was fairly cheaper and Laursens could ask for its orders to be pushed forward when they were under pressure.

4.13.3 Challenges of engaging outside people (consultant and assistant engineer)

Extra manpower was good in that the business continued serving its customers with undistracted attention from ISO 9000 implementation activities. The risk, however, was that employees were deprived a chance to fully interact and bond with the system they were going to deal with every day of their work life at Laursens. They only started getting more

exposure from the standard after certification mainly from the demands expected from them.

4.14 Management

4.14.1 Management representative's limited mandate

The limited definition of the management representative's mandate in a way prohibited continuous improvement. The three responsibilities indicated on the appointment document were: establishment of processes for quality improvement, reporting to top management about the QMS performance and ensuring promotion of customer awareness. There was no any other documentation to help the representative clearly understand what must happen before, during and after implementation. There seemed to be no clear mandate to the representative to continue creating a new organization culture which would go beyond getting the certificate.

It was observed that immediately after passing the first audit and getting the certificate, one could clearly observe a sense of arrival as if that's all that was needed. Issues which used to make people to run around to fix fearing that the auditor may mark the SME against such as general cleanliness in the workshop started to be neglected. It was difficult to motivate people on anything to do with ISO 9000 after getting certified when they felt they got what they wanted. This complacent attitude was confirmed by even seemingly small things such as a culture of frequent postponement of quality meetings or total absconding.

4.14.2 Measurement system and employee empowerment

Tensions between management and employees were greatly reduced since quality decisions were now clearly visible. Checking fixtures and dos and don'ts made everyone to see if a product was a reject or not without any meaningful delay to production. Management was now less involved with daily production issues since employees were now better equipped to deliver quality products.

4.15 Employees

4.15.1 Improvement in employee competence

The skills matrix was constantly updated to monitor skills development of the people. As illustrated in Figure 35 below, which was driven from the employee competence matrix in

Appendix 26, more people attained new skills or improved on their old skills during and after the implementation period.

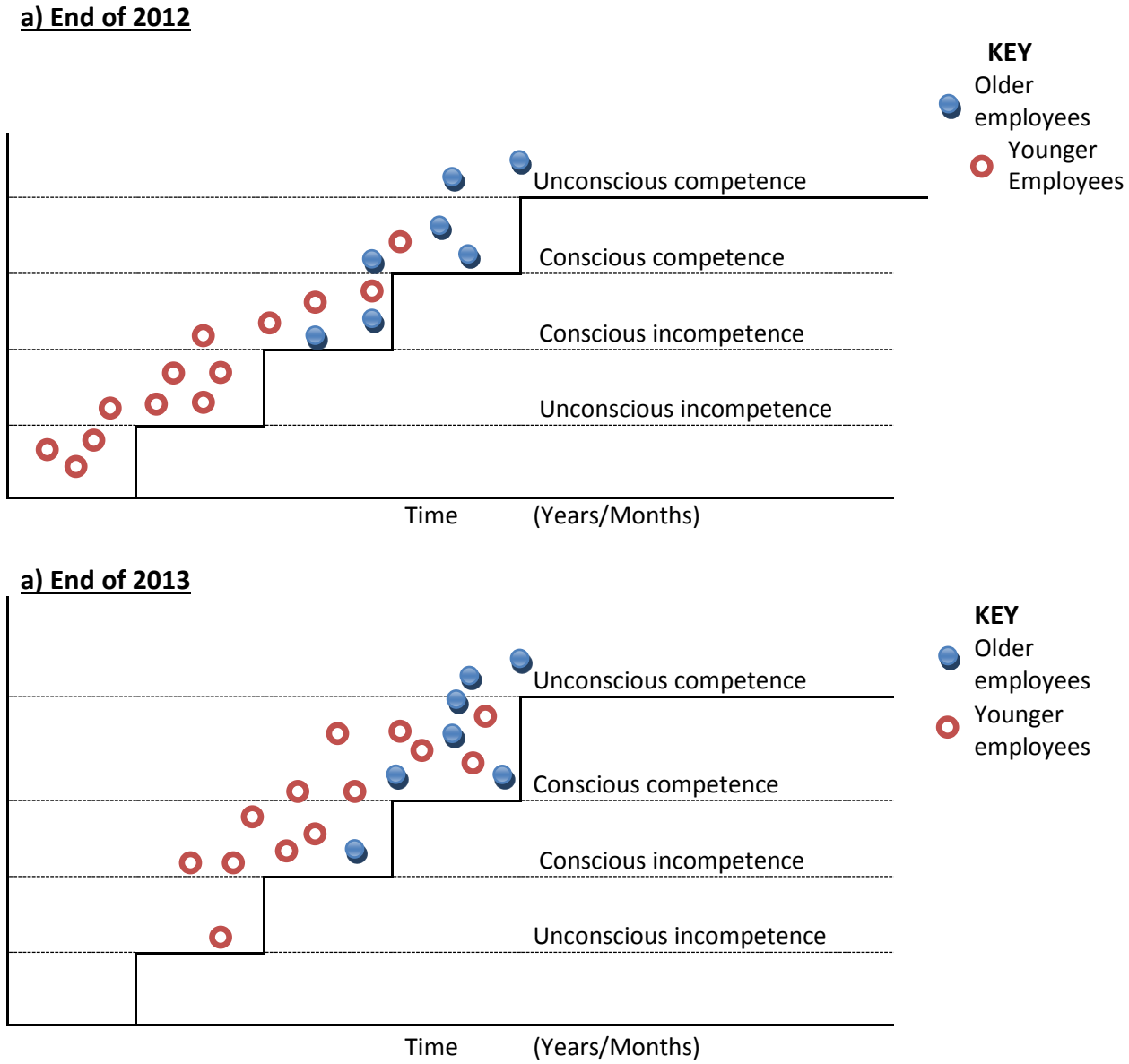


Figure 35: Employee Movement to Higher Competence Level (Adapted from Charlton 2000)

By end of 2013, most young employees had moved from a level of unconscious incompetence to conscious incompetence and some to conscious competence.

4.15.2 Attitude towards the standard

After the audit, employees felt proud of having been part of the implementation process which made their company ISO 9000 certified. ISO 9000 implementation brought a lot of positive changes to different employees, such as; getting formal training as forklift drivers,

firefighting training, first aid training, and a lot of internal training on machinery and health and safety.

All the above changes coupled with improved general working conditions motivated employees to appreciate the standard in different ways as confirmed during internal interviews. The employees also realized that the standard was not there simply to demand more effort from them but was also interested in their own safety needs.

4.15.3 Relations within the organization

Despite high demands from the standard, relations with management generally improved with increase in employee knowledge of the standard. Employees were beginning to see some of the benefits of the standard on their working conditions.

Relations amongst employees improved due to improved communication which came as a result of having common point of reference when discussing production matters. Relations also improved with increase in awareness of how each employee's performance negatively or positively affected others.

Chapter 5. Discussion

5.1 Introduction

From the literature review, external and internal interviews, company records as well as observations made, a lot of human related issues which directly and indirectly impact on ISO 9000 implementation were revealed.These research findings were discussed as per source, however, being compared to each other.

The purpose of this discussion was to reveal any issues related to impact of human factors to ISO 9000 implementation at the SME.

5.2 External interview results discussion

Even though efforts were made to separate these SME into two separate groups of: successful and unsuccessful implementation, analysis of results did not relay on this criteria since it was very subjective. This was so because the standard has many attributes which the SMEs copied with differently due to their diversity in capability.

Despite the challenge that results could not be easily generalized to other SMEs since a small number of SMEs was interviewed, the results were very valuable to give some clues and insight.

In the introduction chapter, Falkena et al (2008) spoke of the South African SMEs responding global competition by also seeking to be competitive. In question 1 all interviewees directly and indirectly showed intensions to either improve operations or impress their customers. None, however, indicated the need to look at their management systems if that was going to be promoting or prohibiting their objectives as advocated for by Pinchot and Pinchot (1993) on organization culture and structure.

On question 2, all interviewees claimed to have achieved what they wanted from ISO 9000 in question 1 after implementation. This was confirmed also in question 5 when all interviewees said the standard was very helpful. It therefore means from implementing ISO 9000, both internal and external reasons can be met. However, the two interviewees who rated the standard at 8/10 and 9/10, are the ones who seemed to have more technical understanding of the standard. Interviewee 4 who rated the company lowest with 8/10 effectiveness, claimed that BS 5750, from where ISO 9000 was driven, was more sound on technical issues. In a way, this agreed with Hoyle (2009) who cited technical challenges with the standard in terms the process model which he claims to confuse a system and a process.

Basing on Poza et al (2009)'s schematic in Figure 2, it is therefore possible that some managers claimed to have successfully implemented the standard when just simply did enough to get the certificate.

In terms of challenges, the challenge which came from SMEs that were still young or had just implemented the standard such as SME 2, was a complain of too much paperwork. The observed trend agreed well with interviewee 4 who said in question 6, that, they did not struggle much since they had already been doing some of the things ISO 9000 recommended. The interviewee claimed that, for them it was just to polish up since most of the recommendations not starting from scratch. This was again in agreement with Poza et at (2009) that, when there are already some existing documented procedure, the effort needed to attain a higher level of functionality and existence was minimum.

SMEs which had sought internal transformation, such as SME 1, 3 and 4, claim to have experienced challenges in changing human behaviour. Reasons for challenges could have simply been due to management over focussing on the technical aspect of ISO 9000 and neglecting the social impact to the people as illustrated in Figure 6 about the emotional phases people go through during change.

In terms of challenges which the SMEs still experience after certification, they all in different words agreed on one particular thing, which was backsliding of employees to their old ways. Spitzer (2007) spoke of introducing new measurement strategies into an old measurement context. The new system fail to be sustained when implemented without standardizing it as the new culture just as illustrated by Vietze (2013) in Figure 9of standardizing the Deming continuous improvement cycle. The issue of not standardising the new system seems to be the cause for backsliding as later confirmed in the last question about implementation dos and don'ts. None of the interviewees gave a clear hint that the new system needed standardising to even as according to Kurt Lewin's three phase change model in Figure 7.

In terms of time allocation on question 6, two of the SMEs which had once been identified as the ones who implemented the standard for external reasons, are the only ones who spent less than 50% of their time on real transformation. These two SMEs are also amongst the three that spent at least 40% of their time dealing with input issues such as introduction of paperwork for buying and stock management. Poza et al (2009) highlighted that the reason for implementation also influenced the attitude towards the standard. It was therefore possible that, if an SME implemented the standard to impress customers, they may claim to

have not experienced much challenges during implementation since there will be no internal resistance.

On the implementation dos and don'ts, it was emphasised that, there was need to understand the standard before implementation and the organization that implements it must mean to use it. This was complementary to Pinchot and Pinchot (1993) who claimed that when an organization has observed a need to change, for real transformation, the whole organization must be prepared to restructure itself to suit the new desired state.

External interviews discussion summary

From the external interviews, it was shown that intentions for implementation will determine if the SME will struggle to sustain the system or not. SMEs which implemented the standard to transform themselves internally struggled with changing human behaviour but enjoyed the benefits and could explain why they say they benefited from the standard.

Effective change of human behaviour was the challenge all interviewees seemed to experience. It was also noted during the interviews that managers technically qualified to run their businesses, seemed to understand how the standard can be made relevant to their companies. Less qualified managers seemed to confine the standard more to external motives instead of internal transformation. This situation seemed to be a limitation to what could be achieved through the standard as had been noted by Maxwell (2007) who spoke of the leadership cap syndrome. Effectiveness of implementing the standard appeared to be directly proportional to how much the leaders were familiar with it.

In terms of leadership understanding ISO 9000 as standard that should impact the whole organization, it seems most interviewees did not know this. None of them could say any challenges related to leadership during implementation, it was just about employees on the shop floor.

5.3 Internal interviews discussion

Even though employees showed some improvement on knowledge of the standard in line with Charlton's (2000) illustration of employee competence in Figure 35, it was still evident that they had divergent views on what the standard was. This situation went back to concerns raised by Zack (1999) that a gap analysis must be done to avoid wrong assumptions that all people have a fair understanding of what ISO 9000 is.

Even though nine employees said ISO 9000 was helpful to their work environment, only four could explain why they said so. It was then difficult to conclude if the standard had been helpful or not to them from this respond. However, linking these answers to the first question, it can be accepted that the standard helped them since they all said positive attributes related to the standard.

The employee, who said it was not helpful, is the one who had been rated as having the lowest literacy and had to use the local language during interview. This number 5 interviewee also even struggled to understand the questions and gave answers which were difficult to link to the question. Without much consideration of this interviewee's views, it was therefore safe to claim that ISO 9000 implementation was helpful to the SME. From this scenario, the researcher could further claim that management did fairly well in making the implementation to bring positive influence to the employees' work environment.

In terms of feedback, all interviewees praised management for feedback and only number 5 employee said he only got it from the QC officer (maybe during first-off signing). The same employee had once said he only gets support from his Production supervisor and now he did not identify him as one of the people that gave him feedback. The reason for not getting feedback from management could have been due to communication barrier as noted by Spitzer (2007) that people struggle to understand each other if there is no shared language.

In question 6, all employees agreed that they were being given opportunities to develop except one employee, who amazingly was the one who jumped the promotion queue from being a casual worker to operator within a few months. The same operator was the only person trained to operate the scaffold connector forming machine yet he said he was not getting growth opportunity. It was therefore fair to say employees got opportunities for growth and this situation helped to boost employees' commitment since they felt they also stood to benefit from the implementation. General satisfaction by employees explains well the observed minimum resistance during implementation. One of the elements noted as key ingredient for successful implementation was employee involvement to give them a sense of ownership.

When ISO 9000 is implemented by business leaders with some technical understanding, it is easy to make it relevant to the respective work situation. In the last question of the interview, all employees said the checking fixtures and first-off signing were helpful. Use of these devices was not advocated for by ISO 9000 requirements or the consultant.

Management with their own understanding saw that these devices fitted well into the QMS. Gryna et al (2007) said that when a quality management system is working well, one sure test was level of employee freedom to make decisions or self-control. First-off signing and checking fixtures were fully run by employees without management involvement. Operators did not need even need a supervisor to tell them to stop because the product quality was not right. They had tools to do this on their own and confirmed their satisfaction by their answer to question 7.

In as much as we can blame management for not doing enough teaching to the people about ISO 9000, part of people's ignorance came from their own lack of conceptual understanding. Interviewee number 1 during external interviews alluded to this issue of general lack of conceptual understanding by employees due to low levels of education.

All the 9 out of 10 employees who said something about what they wanted to be improved seemed to be interested in improvement of their working conditions or relations. From this employee need, it became understandable why a manager with high EQ and low IQ can be more successful in change management due to ability to understand people. Lonmin CEO, Magara in a way agreed saying that technology could easily be bought from elsewhere but employee relations can only be developed from within.

Referring to Table 2 on leadership and management attributes, as well as Figure 2 on a QMS existence and functionality, a simple manager at Laursens would struggle since the SME needed a lot of transformation.

5.4 Company records results discussion

The NCR trends clearly showed that there was need to improve recording of non-conformances, if more transformative performance measurement can be achieved. Perhaps this was because of frustration with too much paperwork. An indication that this may be true is a similar case during external interviews on question 3, where interviewees spoke of too much paperwork, resistance to change and constant sliding backwards of employees. Part of the reasons for poor recording of NCRs could be due to what Drucker (1999) called the shift in management challenges from shop floor employees to blue collar employees. He claims that there are not yet effective measurement systems to pick out poor performance by office employees.

Despite this poor closing of NCRs, there were some positive trends observed on different NCRs which were being recorded. The observed trend in Figure 21 of internal NCRs being

highest while customer NCRs where lowest shows that ISO 9000 management system was being well management to some great extent. This was because, the SME was managing to identify a lot of errors before they got to the customer. It was going to be more worrying if customer NCRs were higher than internal NCRs. This would have meant that a lot of mistakes were escaping through down to the customer. The general decline of internal NCRs was also a good sign of continuous improvement in that the SME was not reducing resource wastage.

Even though the time-span of NCRs evaluated was very short to reach solid conclusions, the down ward trend in internal NCRs agreed with observations made that employees gained some repeatability in the way they operated machines. It was also a sign that the workshop does and don'ts together with checking fixtures were bringing positive effect. This was in line with arguments by Spitzer (2007) that, meaningful operations improvement happens only when people are given the right tools to work with.

Care must however be taken to avoid over relaying on these outcomes since there seemed to be some passive resistance in the way NCRs were being recorded as in Figure 22 especially in the month of June and July. The same attitude of poor recording of NCRs seemed to also continue to poor closing of NCRs discussed below.

Procrastination in making decisions was confirmed by the time it took to close NCRs as shown in Figure 23, even though great improvement was seen. Many reasons could be given for this procrastination; such as shortage of tools and manpower to sort out quarantined material or lack of know-how on what to reject and what to rework.

The problem with not closing both internal and external NCRs early enough was that the opportunity to learn from the event was missed since by the time leadership wanted to discuss, especially with the involved employees, the employees would have forgotten the event. Untimely closing of NCRs could also be blamed on the standard's failure to give clear guidelines on what to do after recording the NCR.

The exact time on the maximum allowable time to close NCRs could not be agreed on due to different types of products and frequency of operations. Basically, the reasonable time to close NCRs can be heuristically deduced per business since the main purpose was to try and prevent the non-conformance from happening again.

At Laursens Engineering some of the operations were run daily, some weekly but generally within a month all different types of production operations would have been done. When results in Figure 23 are compared to data in Appendix 19, it can be seen that the opportunity to learn and improve from non-conformances was not being fully utilized. In the second last column of Appendix 19, several non-conformances are said to have been repeated within a period of three months. On the other end in Figure 23, the SME was taking an average of seven and half months to close NCRs. This, therefore, meant that people could continue repeating the same mistake since management was taking time to reach decisions.

5.5 Observations results discussion

5.5.1 Organization culture impact

According to Maslow's hierarchy of needs discussed earlier by Huitt (2007), the first thing people seek to pursue when they work is security needs. The SME's employment philosophy impacted on the implementation process through not showing any appreciation to new employees who wanted to impress the management and secure permanent jobs. Some of the employees who had been with the company for a long time could be seen clearly showing an attitude of indifference to any new developments for operations improvement since they knew their jobs were very secure. ISO 9000 implementation is not a short term program to effectively function under these circumstances, hence the situation above made it difficult to reap maximum rewards. The situation was in total agreement to Spitzer (2007)'s claims that dysfunctional measurement systems can promote wrong behaviour through rewarding the wrong activities. It seems the SME was rewarding employees for staying long at the company without looking at any productivity issues.

5.5.2 Leadership impact

Basing on the contrast between a leader and manager shown in Table 2, a gap analysis could have been done before implementation to determine the attributes needed on key issues such as the management representative or the type of QC officer to be appointed. For Laursens Engineering, which wanted to transform itself, there was need for a leader instead of a manager who mainly focuses on stabilizing the current situation. Perhaps this was the reason why TUV Rheinland auditor, Steinhobel (2013) said that when they visit some businesses for the second audit, they find them struggling to use continuous improvement to go to the next level as encouraged by ISO 9000.

Lack of many candidates to select the management representative from limited the SME to get the best possible candidate. The other problem with having few managers was that the selected manager was already multi-tasking a lot of activities as observed in Appendix 8. Under such circumstances, there was high temptation to just implement the standard in procedure without any interest in real transformation. Abdul (2012), noted before called this kind of resistance passive resistance.

5.5.3 Implementation motive

Just as was indicated on external interviews, the intentions of implementing ISO 9000 influenced the type of consultant to be hired and general implementation approach. Linking the above to Seddon (1999)'s concerns for bias to the paymaster by consultants and auditors, the SME could get a consultant they could manipulate if they simply wanted a certificate.

The other challenge as noted on observation was pressure from customers which could force the SME to fast track the implementation process to produce a certificate even though not ready go through the change of sustain it.

The SME however, achieved some high level of organization transformation as observed because they selected a consultant who was honest with them and interested in real transformation.

5.5.4 Resistance to change

Basing on the way the whole company was pressed with customer orders and so many other changes which were taking place, there was no clear distinction if this cooperation could be some form of passive resistance as Spitzer (2007) put it.

There was however, notable resistance to change due to what the standard demanded from the employees. Senior employees felt that their pride from work was dented when after so many years with the company, they had to wait for someone to give them a go ahead with production in the form of first-off signing. Their frustration was, however, not easy to justify because, for example, interviewee 3 who was also a senior employee and more experienced than all senior employees even requested in question 4 that he wanted leadership to frequently visit him to check his work. He was the only employee who could operate the press and also weld without any supervision. He was therefore the one who was more qualified to complain of being embarrassed by someone checking his work but he did not.

Spitzer (2007) argued that, the more literate the people in an organisation are, the more people can communicate and understand each other. It seemed this was just lack of understanding of what this really meant as agreed to also by external interviewee 1 in question 4 of external interviews that they experienced challenges due to some employees' low level of conceptual understanding. The real reason for checking people's work was to look out for each other and minimize human error.

5.5.5 Launching implementation and employee involvement

The project was launched before enough assessment had been done on employee workload. One employee who was later made QC officer complained that he could not afford to work as press operator, goods receiving clerk and quality inspector at the same time. The SME did not have systems in place to evaluate employees' workloads as later done in Appendix 28. This was one of the occasions were management representative's knowledge of what it takes to implement the QMS would have helped, by having conceptual understanding of how to sustainably transform an organization as shown in Figure 12 of the learning loop. The manager could not do process mapping of converting the current organization to the new ISO 9000 certified organization in terms of impact on employees.

5.5.6 Management involvement in daily meetings

The challenge of management having to attend every work related shop floor meeting, decision making procedures for daily activities as per ISO 9000's requirements had been properly documented. Even after almost ten months after implementing the standard, management was still attending some of the meetings. Bolden (2007), in a research on leadership development for SMEs, claimed that they found that one of the key challenges for SME owners was to free themselves from the day-to-day activities of the business to focus on more long term strategic future of the organization. It could, however be argued that management attended the meetings in solidarity and to make employee appreciate their support or to help with continuous improvement.

The other source of influence for management to attend daily meetings seemed to come from the fact that supervisors were under qualified making management uncomfortable to leave them to do it alone. This view was in agreement with Drucker (1999) that some old management styles that are no longer applicable to developed countries can still work in developing countries. The situation however, countered confidence boasting in the

supervisors since they got used to inquire with management on almost every little decision which had to be made.

Even though over involvement of management could have reduced respectability of supervisors by their subordinates, it helped to mould a close relationship between management and supervision. There was some shared ownership of decisions.
The working together of management and supervision on a daily basis also helped bridge the gap between management and shop floor people as well as sharing the same vision.

5.5.7 Appointment of the QC officer

The appointment of a QC officer on a fulltime basis showed a clear shift from old management's lack of interest to spent lot of money on indirect labour. This was in line with Cagnazo's (2010) views that for successful implementation, there was need for sustaining performance improvement through a system for managing quality. It was going to be difficult to achieve this without fully appointing a quality official.
From this decision management showed:

- Commitment to improve its product quality.
- Appreciation that the senior operator was overloaded with work from receiving of raw material, assisting junior operators and operating his on press.
- Its intention that they were implementing the standard on a long term basis.

5.5.8 Demerits of selecting the QC officer from within

- Almost in every job advert for a QC officer, one of the prerequisites is that the person must be computer literate, have analytic skills and statistical understanding. There was need to use someone with a systematic understanding of this role not simple ability to use measuring tools. Under qualification of the QC officer handicapped him to fully function on his job since it was not enough to take measurements without being able to tell what the numbers meant.
- Even though he was the most favourable, the opportunity was not opened to a few others who felt they could do the job. This could simply have been done as a formality for all to show that management has no nepotism and intends to give the most qualifying person the job.
- Since this senior employee had been part of the old organization, somehow this risked breeding the old culture into the new organization.

5.5.9 Merits of selecting the QC officer from within

- It was a fair reward to the employee for his loyalty because he used to perform this duty even when it was not part of his job description.
- It sent a good signal to other employees that the company rewards loyal and hardworking people.
- It drastically shortened the time period an outsider was going to take to understand the products and operations involved.
- He did not need training on most duties of the new job since he had been doing it before.

5.5.10 Impact of Production dos and don'ts

Before introduction of dos and don'ts, there was disharmony in the way work was done which resulted in lack of consistence in product quality. When the product was not meeting requirements and employees came together to try and solve the problem there was such a low level of agreement. There appeared to be no common point of reference for effective communication. This problem was worsened when employees stated getting rotated around different jobs where it was discovered that even after being with the company for so long, some employees still had limited understanding of some procedures.

As confirmed by external interview results in question 3 and 4, some employees kept on going back to old ways of doing things even after being shown way which improved quality. There was some lack of quality ownership since some employees when asked why they were not working in a certain prescribed way, they would simply say they were never taught anything like that.

Even after a new employee had been trained on an operation, he could not easily remember every step of the operation. The worse part with new trainee operators was that they were being trained by seniors who had their own duties to mind. The company could not afford fulltime training officers.

Management then thought of writing work instructions to help show employees the right way of performing their duties. There was a challenge however, with work instructions because:

- The work instructions would take longer to prepare while customers are getting poor service. This was coupled by the fact that the assistant engineer who was to prepare

the work instructions had limited exposure to that type of industry hence was going to take more time.

- Most people are known to dislike reading many paged documents only to get a few points out. This was going to be worsened by the fact that most operators had been operating the machine for a long period hence would not like to be taught like new comers.
- Low education level for employees made a jump from nothing to detailed work instruction almost impossible.

Simple dos and don'ts as the ones on notice board of Figure 30 were thus the solutions. The dos and don'ts told employees in simplest form what must and what must not be done for each and every operation in production. The advantages these dos and don'ts had were that:

- They were very short, with five pages being the longest. This made it easy for employees to go through the document upon starting each operation or when they wanted to confirm something they have forgotten.
- They were written from an elementary approach making them understandable by almost everyone.
- Intensive use of pictures made them easier to read than heavily worded documents.
- The input to prepare them mainly came from the people doing the job which made them to a sense of ownership.
- The documents were prepared as working documents meaning they could be easily revised to make them more relevant and understandable.
- They worked well as building blocks to future detailed work instructions while having achieved to solve current quality problems. People now had an agreed way of doing things, in other words they were speaking the same language.
- Another factor was that with the ease with which they could be prepared, soon after a non-conformance has been raised, dos and don'ts could be made as a preventive measure.

When dos and don'ts were introduced, employees now had a common ground to find each other. Teamwork and organizational learning was enhanced since people were now equipped at their different levels to participate in quality improvement which was in agreement with Gryan et al (2007)'s views on deployment of quality goals.

Even though dos and don'ts were not going to bring total transformation to the SME, considering where it was in terms of inconsistent quality standards and lack of work

procedures, they facilitated the company's quality evolution process as illustrated in Figure 36 below.

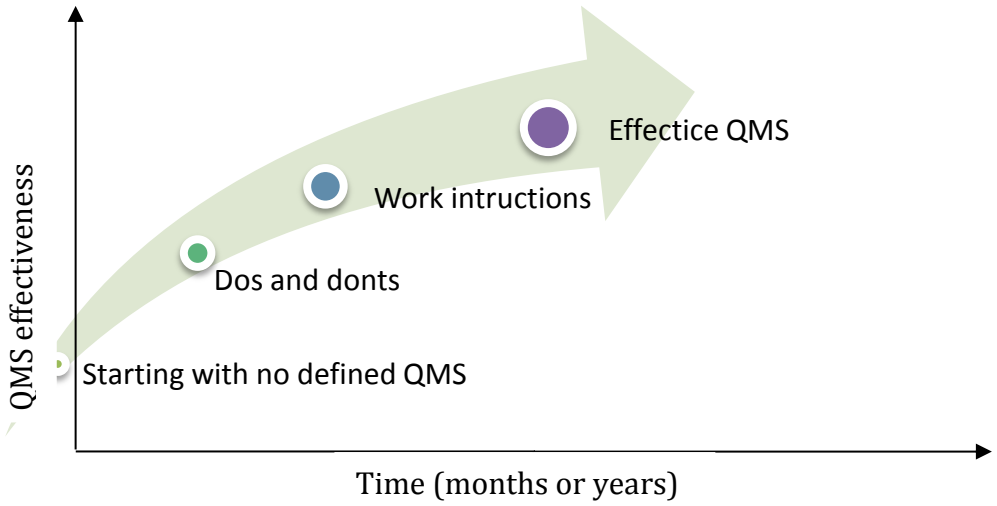


Figure 36: The Quality Evolution

It was not going to be easy to train people who were not used to read any instruction to read a 20 paged detailed document of work instructions before they could cope with a five paged simple document.

5.5.11 Response to checking fixtures and first of signing

A year later, during internal interviews, (Appendix 17) the operators showed appreciation of the work procedures. One of the senior operators even requested that his leaders (Supervisor and QC officer) must frequently visit his work place to help check quality of his work. He said that after introduction of first off signing and checking fixtures for every operation, he now knew that after making a product he could enjoy his sleep at home knowing that the product will not be rejected and come back to him.

5.5.12 Introduction of new systems

Knowing the right time to make a change in the system was always a challenge. However the current approach by the owner of saying for every non-conformance, there must be dos and don'ts the following day to avoid the mistake from happening again, at times created more problems. The owners approach seemed to create the challenge highlighted by Spitzer (2007) of failing to strike a workable balance between existence and functionality of a system. When dos and don'ts were hurriedly implemented soon after a non-conformance some employees truly benefited since they could remember exactly what happened. It was however difficult for some employees to benefit since at times there will be still some

tension with management especially on costly non-conformances. This was one of the situations where the manager needed not to just blindly implement things but figure out the appropriate moment.

5.5.13 Benefits of engaging employees

Cross-training of people brought some positive results when business slowed down towards end of 2013 to beginning of 2014. Management had been hesitant to implement this request by employees. When business slowed down, the company had to lay off some of its casual employees resulting in some machines being left without operators. During that period, the remaining employees could be easily rotated to other machines since they had been given the exposure.

Even though it came as an employee initiative, giving employees exposure through cross-training helped management to speed up real training to replace retiring employees. When new employees were moved from unconscious ignorance in Figure 35, due to their inexperience as school leavers to conscious ignorance, there was increase in general quality awareness and a receptive attitude to learn since the people had seen where they were and where they should be skills wise.

5.5.14 Consultant's positive impact

The consultant's key attributes of being positive, friendly (unintimidating) and flexible to customer needs however holding on to expected standards, allowed people to openly come out if they did not understand certain issues. This helped the SME to avoid any shortcuts since they could easily request for more explanation or shifting of due dates when they were not ready. Such a realistic approach by the consultant was also good for the company in that they were not just forced to follow procedure dogmatically but they could make additions and adjustments to suit themselves however with the standards boundaries. The working relationship between the consultant and the SME was in line with Pinchot and Pinchot's (1993) claims that under an open and friendly environment, more transformation can be achieved.

5.5.15 Consultant's possible negative impact

The cooperativeness of the consultant, however, had risks that it could easily tempt the SME to be too relaxed in achieving certain tasks in time. This was confirmed by a number of tasks in the task list which kept on being postponed till close to audit date.

As noted by Seddon (1999) on the history of ISO 9000 during literature review, the consultant could not be hard with the client since it was them who directly paid him not any ISO 9000 related bodies.

Bringing outsiders to help with implementation caused delays to effectively integrate the standard into the current organization culture. As noted by Arnold (2013), the more outside people are involved, the less employees get impacted on by the standard for transformation.

5.5.16 Auditor's positive impact

Comparing the auditor used by Laursens to the strict auditors mentioned during literature review by Seddon (1999) about the LAN Company, one can see that the auditor's approach influences management's attitude. The auditor used by Laursens was more interested in meaningful transformation in the SME in line with ISO 9000 expected standard not sniffing around for reasons to fail the company. Management thus openly admitted an outstanding issue instead of hiding.

5.5.17 The challenge of hiring extra people

Employees were deprived the full opportunity to interact with the standard since some of the duties were carried out by the assistant engineer and consultant. The challenge was confirmed when all interviewed people in question 1 of internal interviews showed that they did not clearly understand what ISO 9000 was? Use of extra people to implement the standard failed the people to have enough emotional bonding with the program.

Again the challenge of hiring extra people on a short term basis for implementation purpose was confirmed by poor recording of non-conformance reports in Figure 23 when the assistant engineer was no longer coming on a fulltime basis.

5.6 Discussion of results per individuals involved

The context of human factor impact. A preamble

As revealed in the literature review, internal and external interviews confirmed in observation results, the impact of human factors to ISO 9000 implementation takes place before, during and after implementation as illustrated in Figure 37 below.

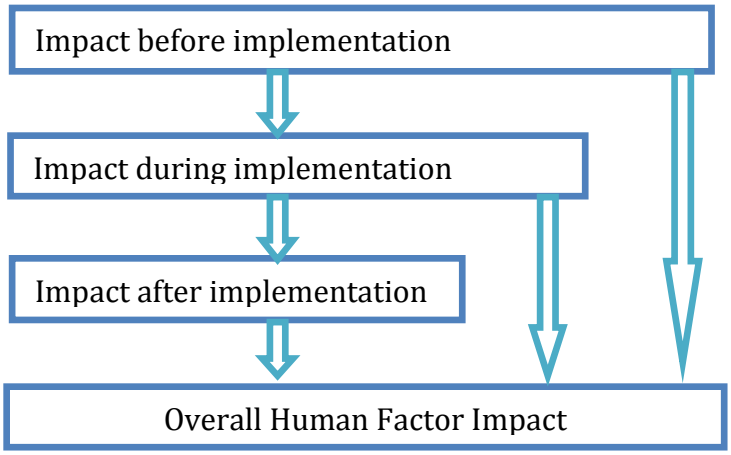


Figure 37: How Human Factors Impacted on Implementation

- There are factors which affected implementation outcome, that existed before implementation even started such as motive for implementation. If the SME just wanted a certificate real transformation was not achieved but simple window dressing to impress the auditor.
- Knowledge of the standard by management before implementation began, impacted on the implementation process and continued even after especially on educating the employees.
- Management's leadership skills combined with knowledge of the standard were key to employee relations which in turn influenced how much they will buy into the QMS.
- General literacy level of employees was directly related to easy of implementing the standard.

Results of different people's impact during implementation of ISO 9000 at the company were discussed below

5.6.1 Owner's impact

The SME had an advantage of an owner who was qualified in operations management such that he did more than simple documentation work to pass the standard. The standard simply speaks of having work instructions without mentioning how they can be made relevant to employee of different intellectual abilities. The owner proposed use of short manuals called dos and don'ts; checking fixtures and first off signing. Each of these changes by the manager impacted on the ISO 9000 implementation as described below.

Introduction of dos and don'ts

- Transformed employees from each relying on his own procedure to all using an agreed procedure.

- Repeatability and predictability was achieved through using one laid out procedure per operation.
- Effective performance measurement and team learning was aided through a common language.

Introduction checking fixtures

- Transformed the SME from relying on the experienced senior operators through empowering junior operators to be independent.
- Motivated the QC officer by lessening his job in that employees were now empowered to make some of the decisions alone.
- Made disciplinary procedures related to product quality more effective since people could easily tell between right and wrong.

Introduction first off signing

- Reduced wastage of resources by allowing production to only start when expected quality standards have been met.
- Transformed the SME through encouraging team work and communication

Despite these positive contributions, the owner negatively impacted on the management representative's performance by constantly getting involved in duties which were no longer his responsibility as discouraged on most SME owners by Fracaro (2007).

5.6.2 Production manager's (later appointed MD) impact

Despite being a good manager, challenges came when he was appointed to be MD with the company owner now leaving to do other things not related to the company. The company still needed a leader not a manager to radically transform it. This was perhaps the reason why the company owner who was more of a leader than a manager still had to keep on getting involved in some issues which were now supposed to be the new MD's duties.

Continuous involvement of the former MD made some people to see the new MD as weak or incompetent. There was less innovation in product improvement and work procedures once the owner left. Even though employees accused him of slowing down things, he was not fully responsible for this development. As noted earlier on during literature review by Pinchot and Pinchot (1993), there was constant countermanding of instructions by the company owner. The new MD was not as empowered as the previous MD who was the company owner and could make decisions on his feet without anyone's approval. This scenario affected the transformation expected through ISO 9000 implementation during and after.

Decisions were slowly made, for example managing quarantined material shown in Figure 31. This caused some employees to question genuineness of intentions to transform the organization.

Part of this challenge went down to the issue of SMEs failing to compete with big organizations to attract competent business managers. Again you rarely find really competent people without any desire to go up the organizational ladder and are just happy to stay where they are forever (Whittlesey 1998). As illustrated on Maslow's hierarchy earlier, people are always trying to improve themselves to the next level till they get to self-actualization by owning their own businesses or being big bosses at some big company.

5.6.3 Assistant engineer impact

- It was his first time to participate in ISO 9000 implementation hence the engineer took time to get to speed with what was expected from him.
- It was his first time to manage checking fixtures and dos and don'ts hence his effectiveness was affected at early stages.
- In the short term the engineer helped lesson the burden for the QC officer and production manager on taking some of the duties yet again in the long run this deprived them the opportunity to be in full control of the implementation process.

5.6.4 Production supervisor

Again lack of academic qualifications limited him to fully participate in creating continuous improvement documents as people on the ground. This negatively impacted on quality improvement since management could not observe all activities step by step.
The supervisor however positively contributed a lot to the implementation as below:

- New management was not yet aware of many people's skills and abilities when implementation started. He helped with that information making it easy for them to quickly learn about the SME.
- As the most senior man in the organization, he was trusted by most employees. When new management came and started implementing the standard, they had not yet gained trust of employees. He helped to motivate employees to accept and support what management was doing through giving them assurance that it was for everyone's benefit.
- He helped management customer and employee information since he had worked with them for a long time.

- Due to poor documentation in the company in terms of product and tool identification, at times people struggled with production. It could have been worse but he became the moving library for production information.
- Due to racial problems in SA, effectiveness of disciplinary proceedings could have been affected by some people treating it as mere racial discrimination. However with the way they respected and trusted him when he approved that a wrong had been done, people were willing to take responsibility.

5.6.5 General employees

Employees helped by their ability to cope with so many changes happening in the SME.
However, employees negatively impacted through their lack of conceptual understanding due to low educational levels.

- As stated by one external interview candidate (SME 1) and Erasmus et al 2007, general low level of education by some employees meant a lot of training needs which made it difficult to achieve certain simple tasks quick enough since more time had to be taken to explain things.
- The observed widening trust gap between employees and management by Grobler et al (2006) and Pinchot and Pinchot (1993) seemed to constantly affect building positive relations. Some employees could easily suspect management of ulterior motives on anything they did not understand.

5.6.6 Consultant

His experience with ISO 9000 implementation and approach of tailor-making the standard to suit a company's scenario benefited the company.
Complete transformation was however difficult to achieve because:

- The consultant had no engineering or management experience to help him fully understand the SME's business systems. Hence issues such as checking fixtures and dos and don'ts had to be suggested by the company owner.
- Since his business survived on the number of ISO 9000 certifications he does, there was risk of not giving enough time to the SME for real transformation needed when having many clients.
- Again making a living directly from successful ISO 9000 implementations created risks of colliding with auditors resulting in certifying a business which is not ready.

5.6.7 Auditor

The auditor focused more on conformance to requirements such as documentation; load tests certificates; non-conformance report but did not investigate much on real transformation which happened on ground. This made the audit to appear more like box-ticking audit not an audit to see if the organization was doing what it says it does as per objective of ISO 9000.

The auditor had however clearly stated that for the first audit he was interested in seeing if there was genuine intention to run the business professionally hence he did not expect everything to be perfect the first time. The auditor's positive attitude made management to feel free even to seek clarification where they did not understand which was the opposite of what Seddon (1999) had spoken of in one LAN company where auditors were unnecessarily strict to the extent that management had to hide some documents.

5.6.8 Indirect (external) factors

Even though in many ways ISO 9000 could help an SME improve its operations, the standard was not of much help in terms of changing suppliers and customers' behavior. As noted by Hoyle earlier in section 2.6.2 of Literature review, the standard's narrow view of a process, made it to fail to appreciate some elements which impact on the internal processes such as raw material suppliers.

On one side suppliers could take advantage that they control the market and not listen to the customer demands. Most of the companies who want to deal with ISO 9000 certified business make the assumption that every ISO 9000 certified company is a very professional company since it would have gone through a very grilling experience to transform itself. Such a situation, as noted by Seddon (1999) shows that a business may be forced to get the certificate even when not ready for the standard or unable to sustain it. This was shown in Figure 24 and 25 where some ISO 9000 certified suppliers showed no sign of improving quality of their products.

Maximum results were therefore difficult to reap from the standard since human behavior of people outside the organization was influential even through the SME could not change it.
Even if the company implemented the standard with good intentions to improve service to its customers, still it was limited to fully achieve this by its suppliers. There was nothing on ISO 9000 regulations for the SME to effectively motivate some of its suppliers to improve

quality even though supplier performance impacted on their operations. The only document sent to the supplier was a supplier NCR in Appendix 26, which the SME designed on its own. No matter how elaborate these reports were, the supplier reject rate was increasing as shown in Figure 24.

5.7 Implementation dos and don'ts before implementation begins

From the proceeding discussion in this research, for successful implementation of the standard, the following dos and don'ts were found to be worth considering.

5.7.1 Management

Do a research of what the standard is all about before starting implementation, finding a consultant and selecting a management representative.

Do not select a management representative with limited general knowledge of quality systems and little exposure to shop floor people.

5.7.2 Employees

Do not implement without first seeking to improve communication and level of trust with employees.

Do convince employees first that the standard is to improve the whole organization not mere increase in workload.

5.8 Implementation dos and don'ts during implementation

5.8.1 Management

Do not implement the standard for short term purposes since it is designed for long term solutions.

Do not rush through implementation to get to the finish line without allowing people to settle into the new system.

Do not be too strict on mistakes made during learning period for any new strategy.

Understand that most people resent change and have patience with employees.

5.8.2 Employee

Do not simply import and implement work instructions without tailor making them to match employees' current level of competence.

Do not implement any performance measurement indicators before explaining and agreeing as much as possible with employees.

5.9 Implementation dos and don'ts after implementation

5.9.1 Management

Do not stop investing in continuous improvement simply because you have passed the audit.

Do not make simple comparison of the standard such as quarterly financial indicators but aim for change in behavior on shop floor.

5.9.2 Employee

Do not show any lack of interest to employees about quality once audit is over.

Celebrate achievement with employees and acknowledge all the improvements.

Chapter 6. Conclusion

6.1 Research highlights

Even though the research had generalizability challenges from the fact that external interviews were done on a few candidates, it was made clear from the research that the human factor makes significant contribution to implementation of ISO 9000 from before implementation, during implementation and after implementation.

6.2 Human impact to ISO 9000 implementation

Below is a summary of human attributes which were found to impact on the implementation of ISO 9000.

6.2.1 Whole organization

Motive for implementation and experiences during implementation influenced people after gaining certification to either continue seeking more continuous improvement or not. It can therefore be concluded that effective behavior change will not happen is the QMS is implemented as once off event, instead more effort for organization transformation is needed even after implementation.

6.2.2 Management

Under management, it can be safely concluded that their general knowledge of quality systems, pre-existing relations with employees and motive for implementation are key factors that affect the outcomes of the implementation. Even though behavior change of employees on the shop floor is key to successful implementation, it is these factors that drive and sustain it.

As illustrated in Figure 14 of theoretical framework even if the standard is good for an SME, management does not know how to make it relevant to their business no meaningful results will come out.

6.2.3 Management representative

In addition to management attributes above, there were factors more specific to the management representative listed below.

- The representative was supposed to have a mixture of leadership skills to help transform the SME to its new status and some management skills to stabilize the newly acquired status.
- Ability to study the work environment and anticipate resistance to change was vital to proactively deal with issues which could delay the project.

To summarize the importance of management representative's role, he was the one actively in touch with management, the consultant, auditor and employees hence he was the heartbeat of the implementation project influencing engagement of all other components. Sustainability of the standard therefore depended mostly on management's representative.

6.2.4 Supervision

Supervision helped in the implementation through by being the interlink between management and employees through key attributes such as:

- Ability to gain people's trust and be the communication channel between employees and management was critical especial during the beginning of the implementation.
- Quick understanding of the standard during implementation was important since employees learnt better from one of their own than a hired consultant or management personnel.
- Courage to face management or employees and speak the truth if either of them was not doing right.

Supervision thus worked as the mouthpiece for employees and eyes for management. This clearly shows that there was no way management and employees were going to easily have a good working relationship without involving supervisors.

6.2.5 QC officer

One of the important skills needed was numerical literacy to comprehend basic statistical analysis. The other key attributes needed were good communication skills and relations with people of different age groups was critical for achievement of quality objectives

6.2.6 General employees

Even after having good management and supervision, employees have attributes they needed to have for successful implementation such as:

- Good conceptual understanding minimizes the effort needed to give instructions.
- General organization culture enhanced employees' receptiveness of new developments
- Level of experience and intellectual abilities coupled with good communication skills were key ingredients to effective team work.
- Employees willingly accept product quality responsibility when given the right tools to work with.

As shown on the theoretical framework in Figure 14, it is employees, who on a daily basis interact with products and services which are finally delivered to the customers. Conclusions can therefore be drawn that their behavior towards the standard can be directly linked to customer satisfaction.

6.2.7 External human factors

Considering external human factors, it was shown that even if an SME does all it can to successfully implement the standard, there were issues beyond its control which however, affected outcomes. It can therefore be safely concluded that the standard was not the complete dosage to help an SME satisfy its customers since some quality related factors were beyond its boundaries.

6.3 Closing summary

Even though the research's findings may not be directly applicable to different SMEs, in principle the results were helpful for giving indications and clues to different SMEs identified in Section 1.3 of the research purpose as following:

- SMEs interested in implementing the standard now know what their employees or management must do and must not do if they want to successfully implement the standard.
- SMEs not interested in the standard got some redefining of their perspective about the standard. In terms of negative issues they blamed on the standard, insight was given on whether the fault was with people who implement it of or its own shortcomings.

6.4 Overall Conclusion

The research was not able to produce results easily generalizable to all other SMES due to the limitations of the case study's small size, few external and internal interview candidates, limited period of study and varying business scenarios different SMEs operate in.

To a greater extent however, this research was successful because:

- It managed to systematically highlight how human factors impacted on ISO 9000 implementation outcomes basing on what happens before, during and after implementation.
- The research gave insightful information through categorically showing how management and employees impacted on implementation outcomes.

6.5 Recommendations

- For more established results on human factor influence to ISO 9000 implementation, a deeper search is needed in terms of spending more time on an SME as well a broader search in terms of interviewing more SMEs.
- A holistic approach to researches of this kind is always necessary for meaningful results. No premature assumptions must be made to think that it is only a certain group of people in the organization who must change. A study is needed on both the people giving instructions and the people receiving instructions about how they impact on implementation outcomes.

6.6 Possible future research areas

- Impact of external factors such as government policies and economic environment to ISO 9000 implementation.
- Impact of management's educational qualifications to SME growth or organizational transformation.
- How sustainable employment equity relates to level and quality of education in SA.

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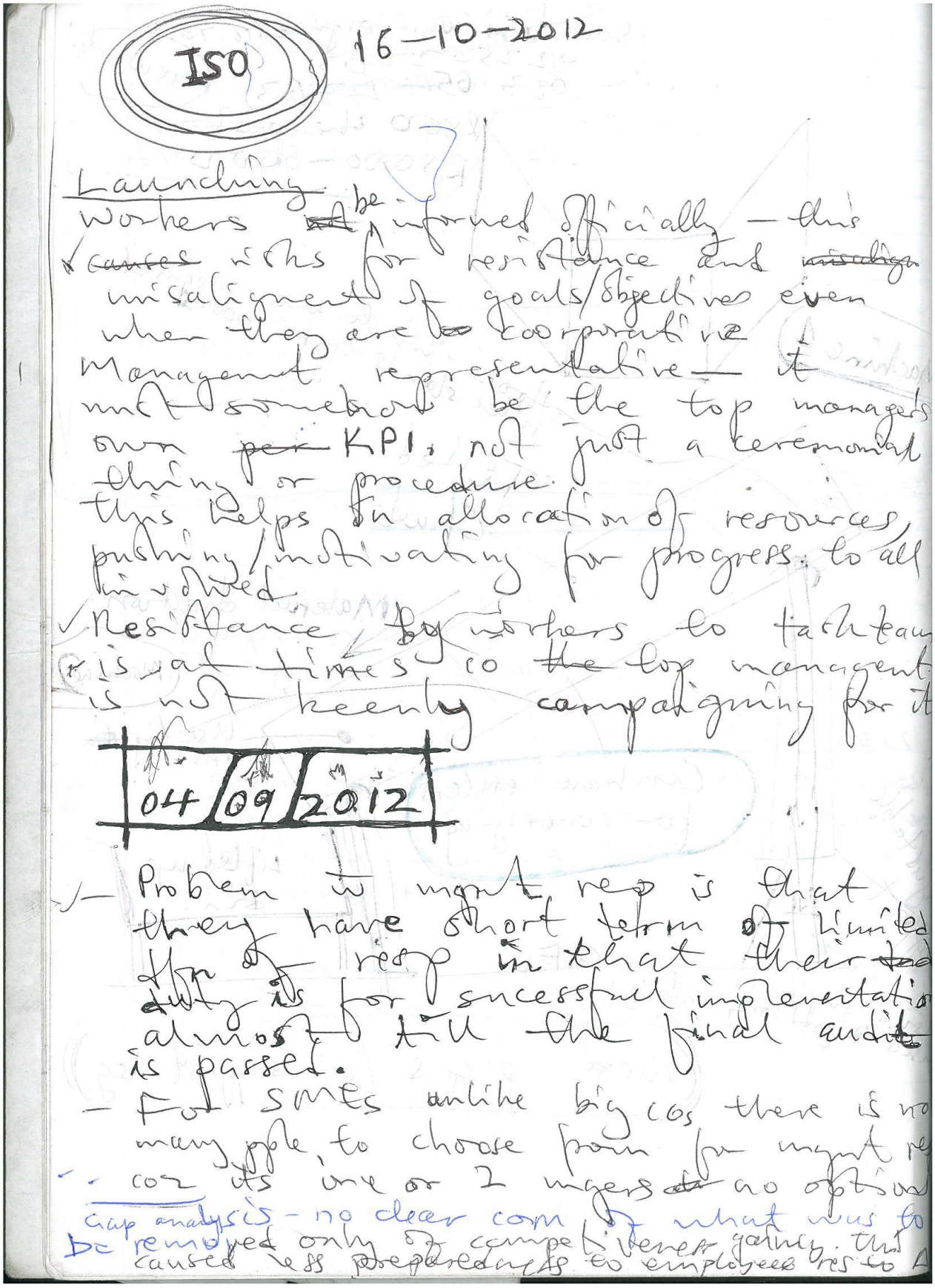
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Appendices

Appendix 1: Launching the Project



Appendix 2: First-off Signing

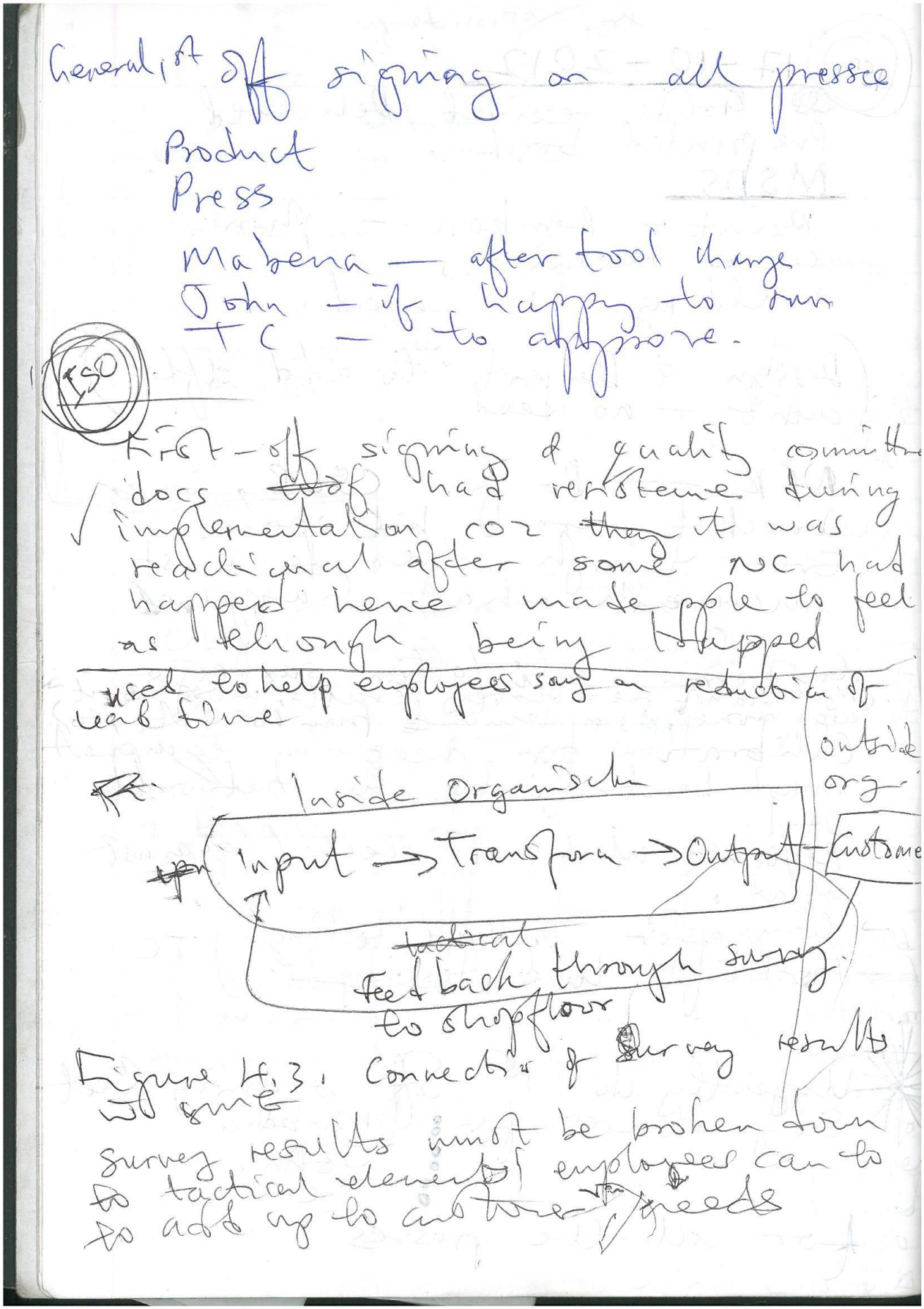
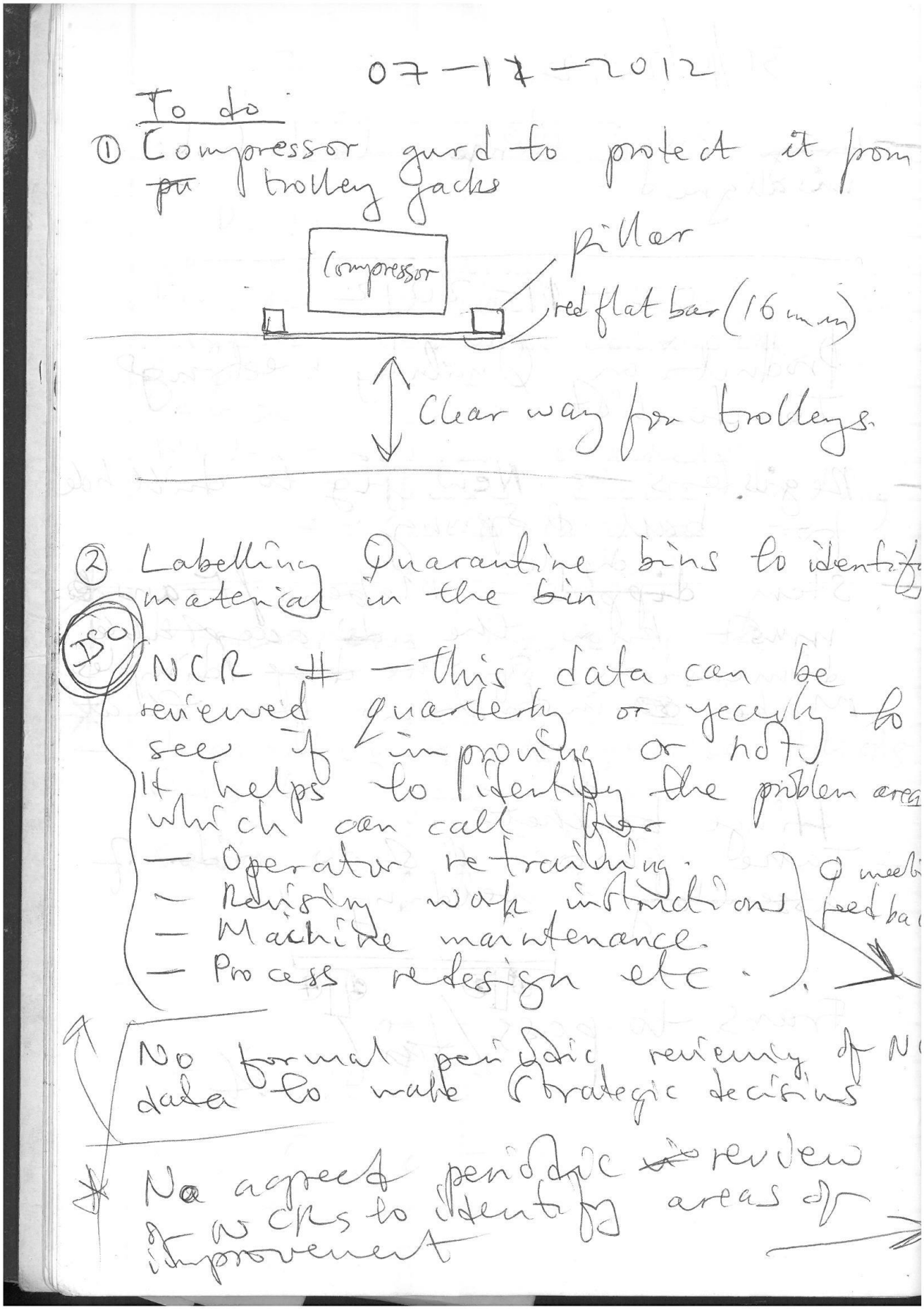


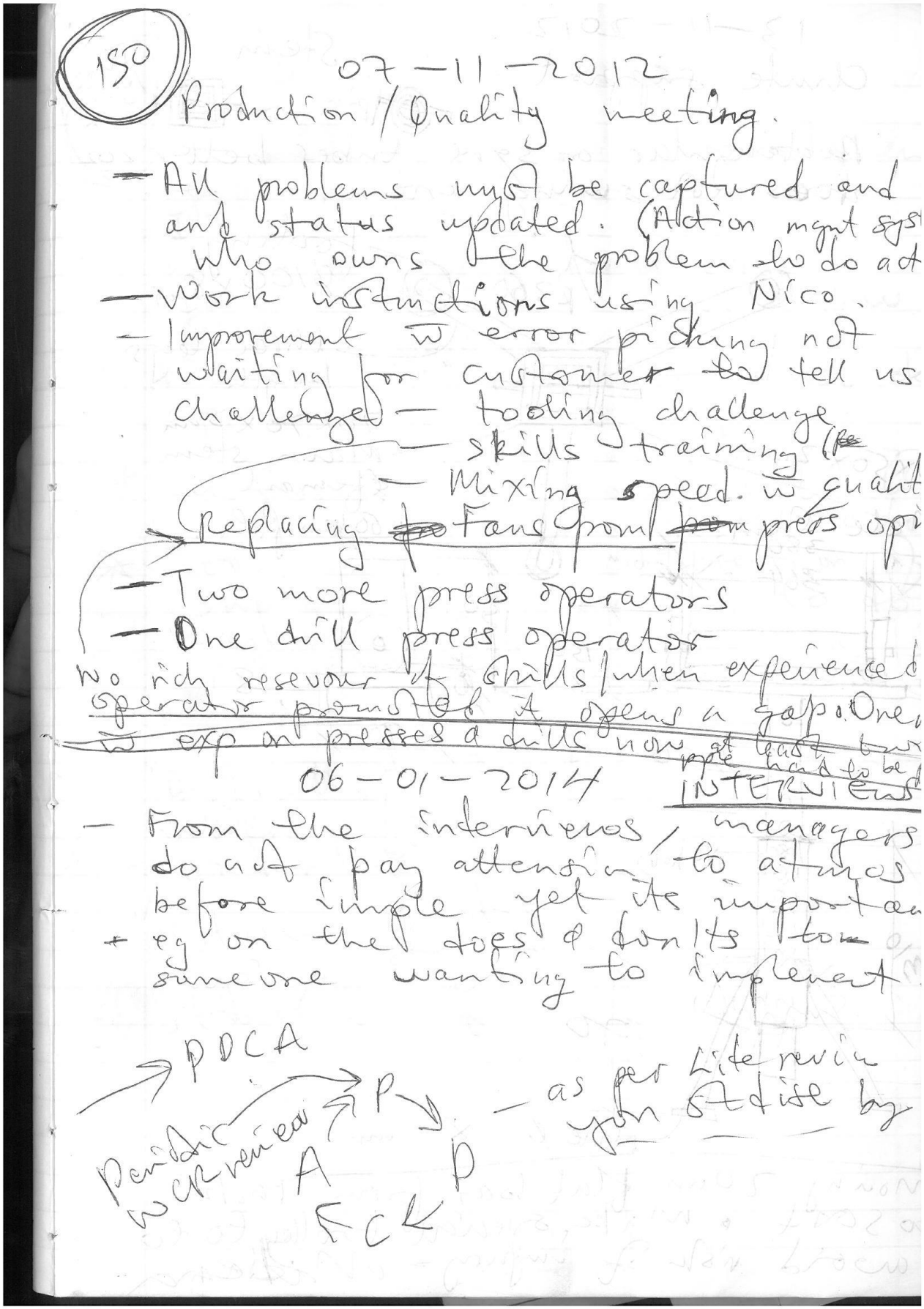
Figure 4.3: Connect of survey results

some survey results must be broken down to tactical elements employees can to to add up to and have needs

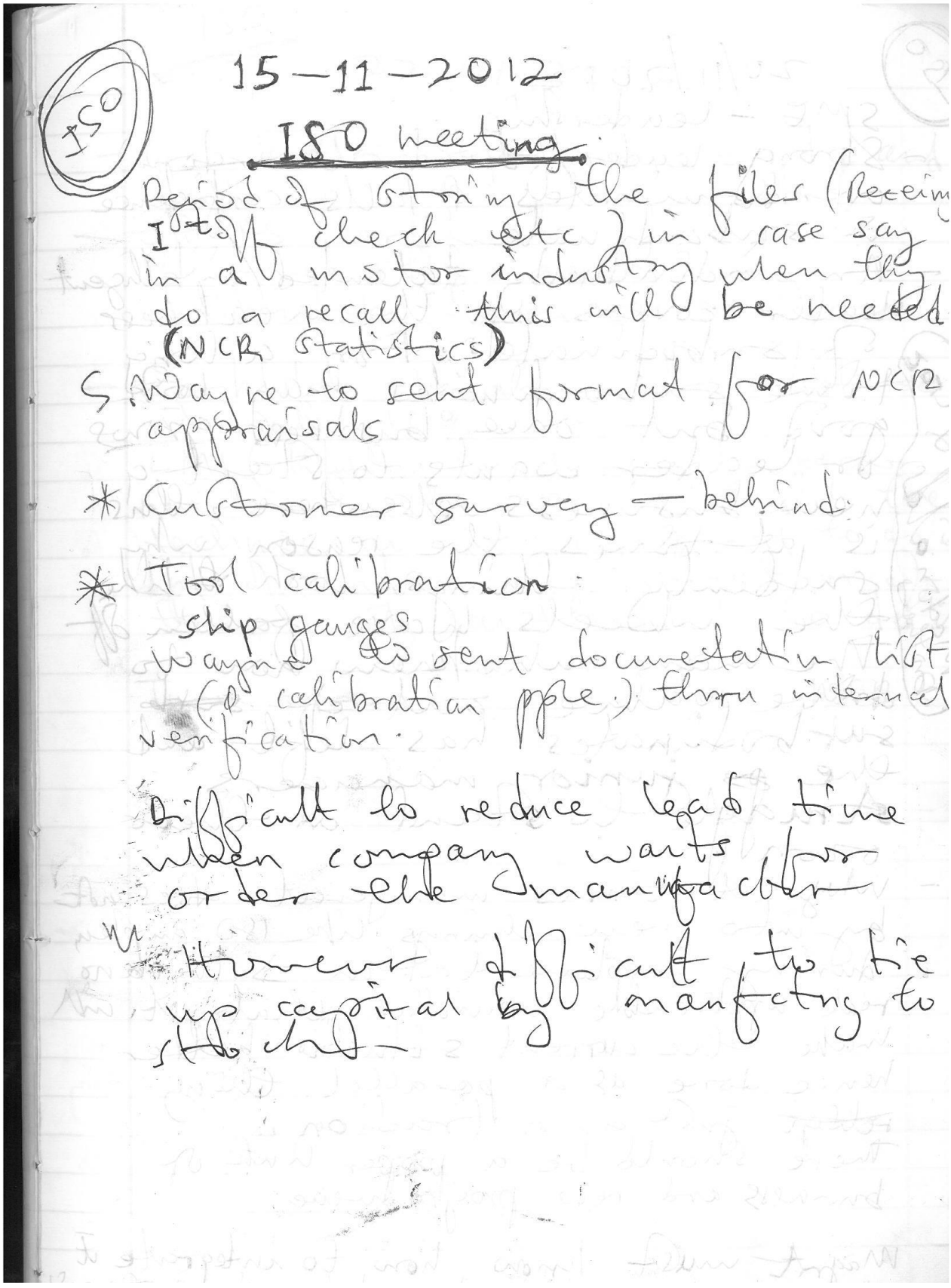
Appendix 3: NCR Data Review



Appendix 4: Transition to QA from QC



Appendix 5: Ordering System and Customer Survey



15-11-2012

ISO

ISO meeting

Period of storing the files (Receiving Inspection check etc) in case say in a motor industry when they do a recall this will be needed (NCR statistics)

S. Wayne to sent format for NCR appraisals

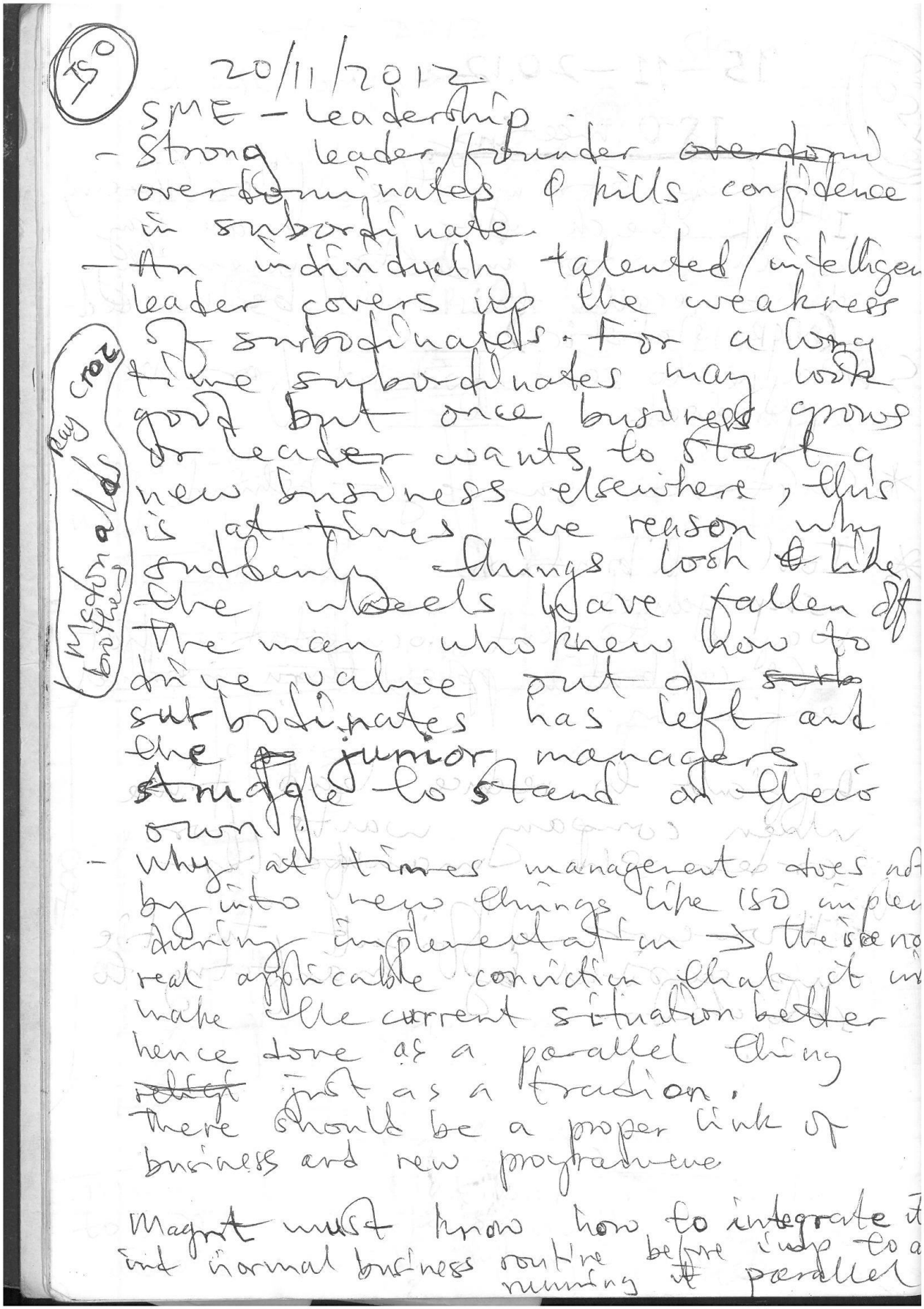
* Customer survey — behind

* Tool calibration
  slip gauges
  Wayne to sent documentation list (& calibration appl.) thru internal verification.

Difficult to reduce lead time when company wants order like manufacturer

However difficult to tie up capital by manufacturing to stock

Appendix 6: SME Leadership/Management



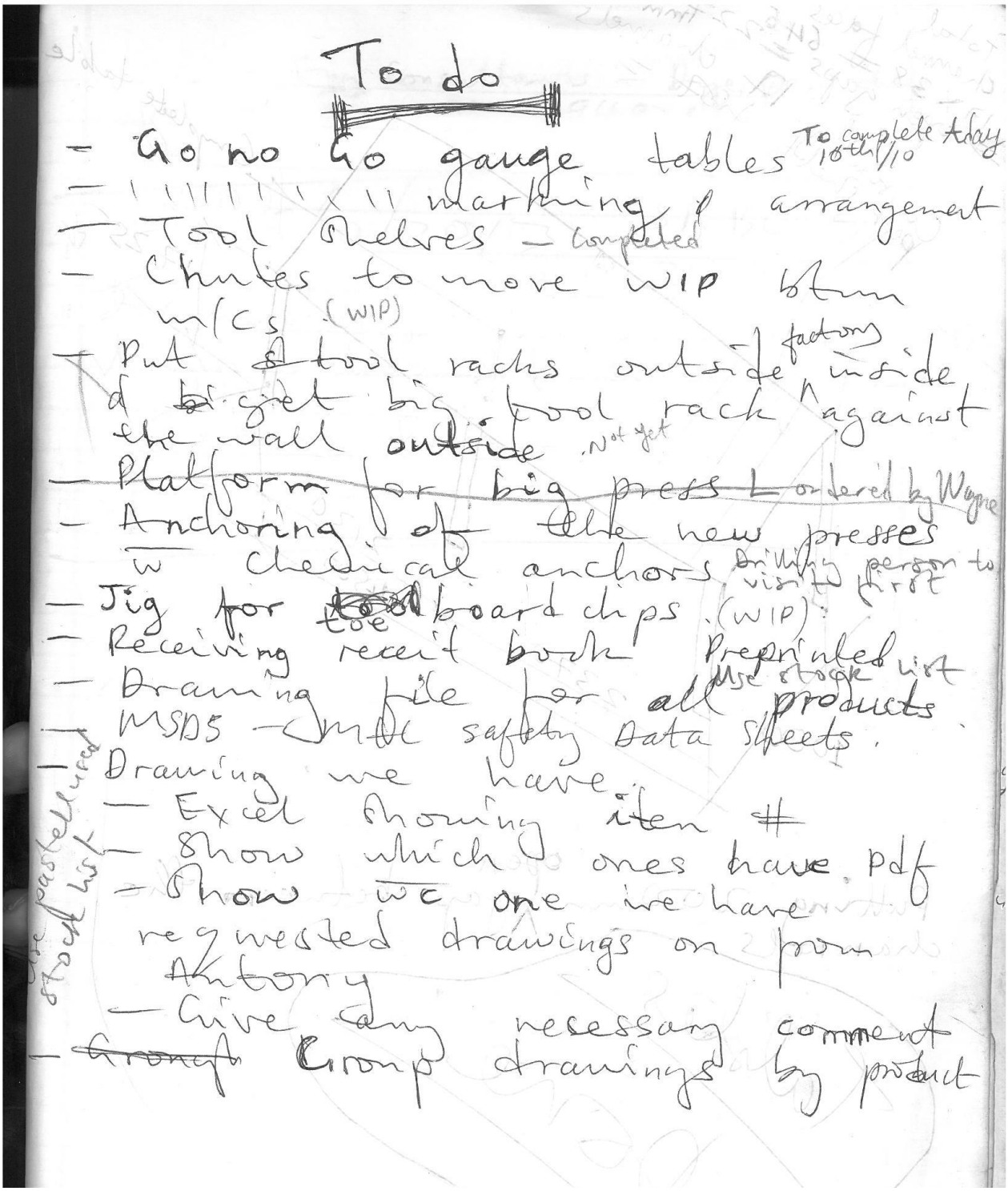
20/11/2012

SME – Leadership

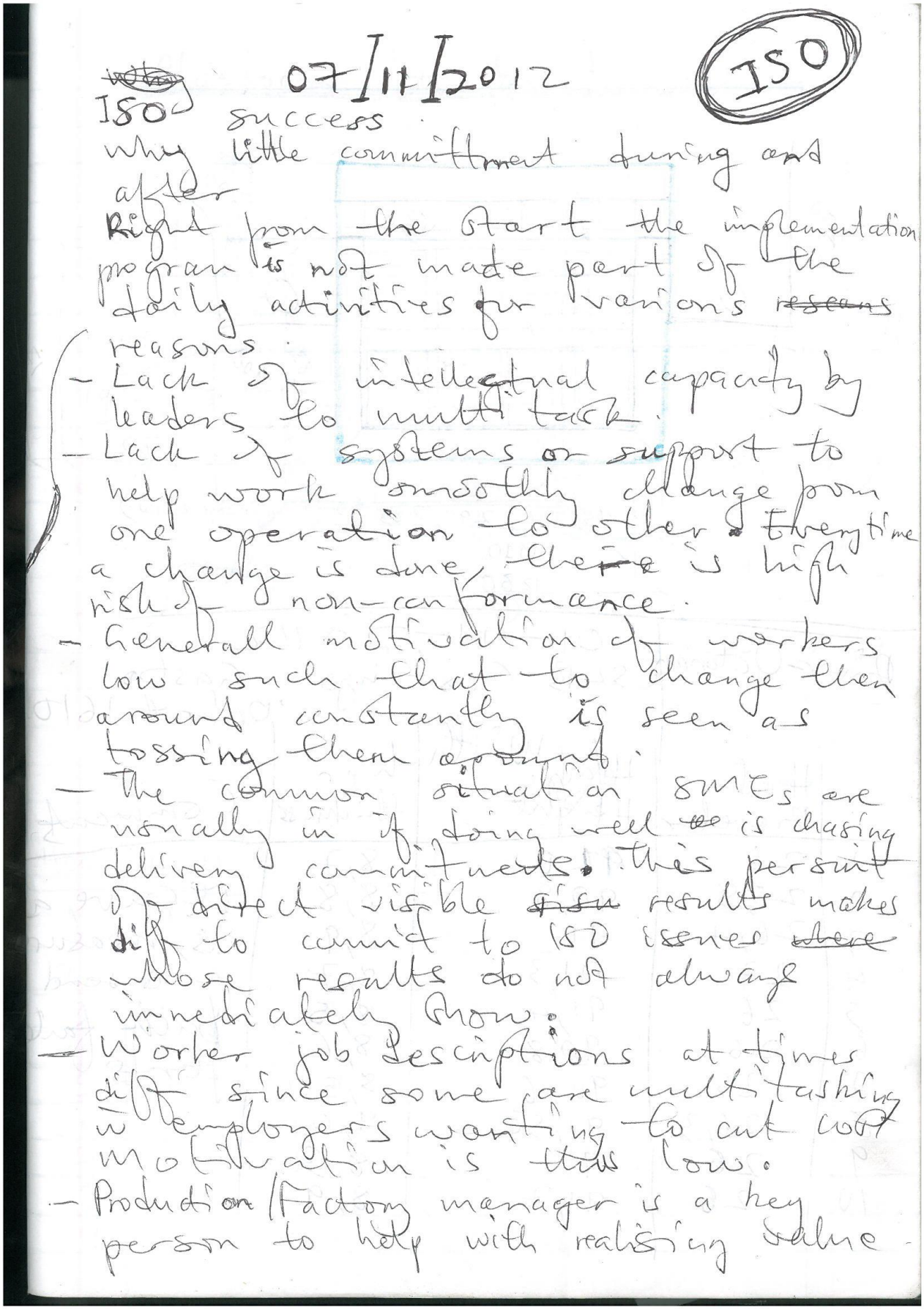
- Strong leader/founder ~~overdomi~~ overdominates & kills confidence in subordinate.
- An individually talented/intelligen leader covers up the weakness of subordinates. For a long time subordinates may look good but once business grows or leader wants to start a new business elsewhere, this is at times the reason why suddenly things look & like the wheels have fallen off the man who knew how to drive value out of ~~sub~~ subordinates has left and the junior managers struggle to stand on their own.
- Why at times management does not by into new things like ISO implem during implementation → the idea no real applicable conviction that it w make the current situation better hence done as a parallel thing ~~rather~~ just as a tradition. There should be a proper link of business and new proactivene

Mgmt must know how to integrate it int normal business routine before jump to a running it parallel

Appendix 7: Making of more Go/No go Gauges (Checking Fixtures)



Appendix 8: Commitment Issues



07/11/2012

ISO

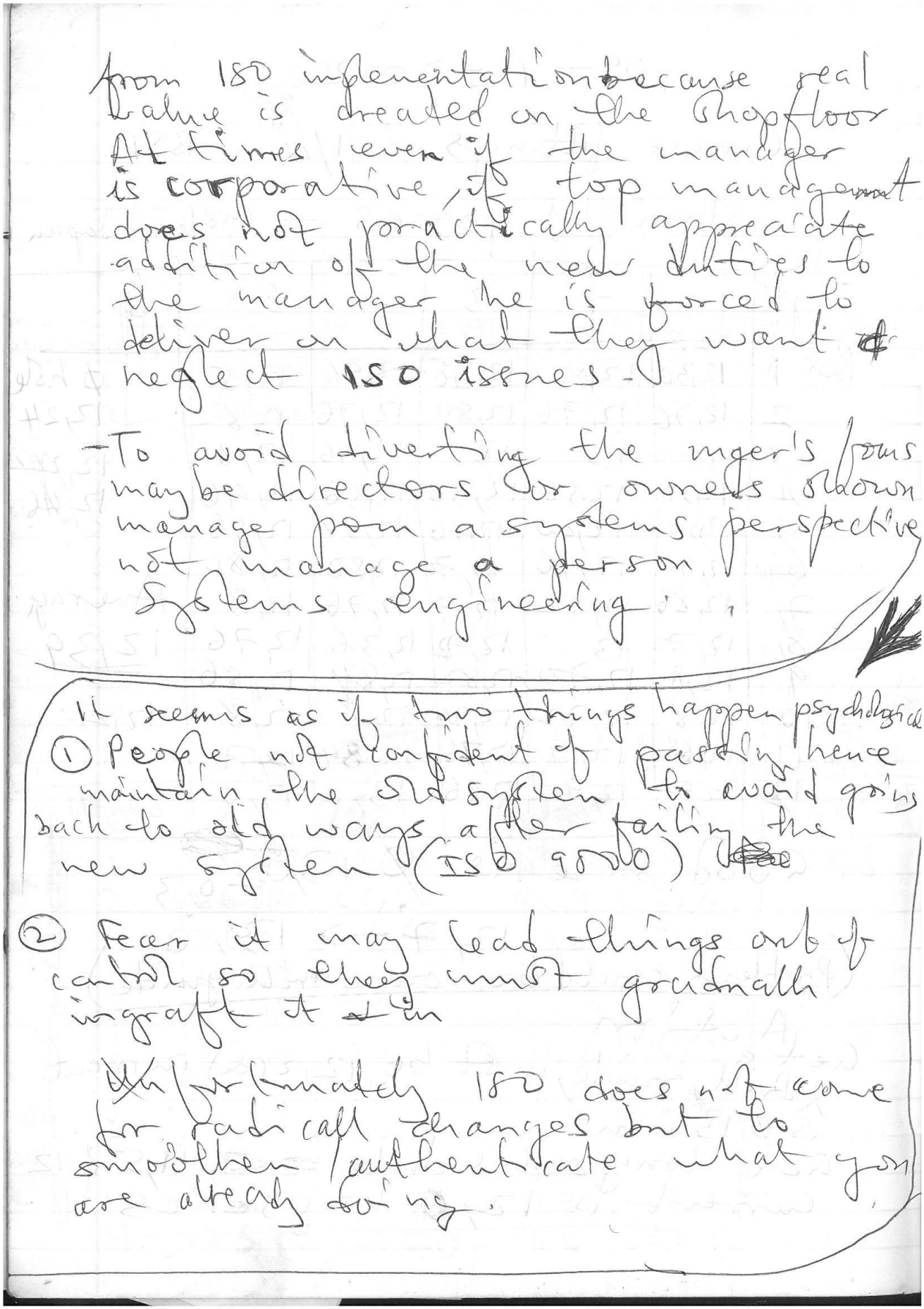
ISO success

Why little committment during and after

Right from the start the implementation program is not made part of the daily activities for various reasons

- Lack of intellectual capacity by leaders to multi task.
- Lack of systems or support to help work smoothly change from one operation to other. Everytime a change is done, there is high risk of non-conformance.
- Generall motivation of workers low such that to change them around constantly is seen as tossing them around.
- The common situation SMEs are normally in if doing well is chasing delivery commitments. This persist of direct visible results makes it to commit to ISO issues whose results do not always immediately show.
- Worker job descriptions at times dilute since some are multitasking w employers wanting to cut cost motivation is thus low.
- Production/Factory manager is a key person to help with realising value

Appendix 9: Real Value of ISO 9000 Implementation



from ISO implementation because real value is created on the shopfloor At times even if the manager is cooperative, if top management does not practically appreciate addition of the new duties to the manager he is forced to deliver on what they want & neglect ISO issues.

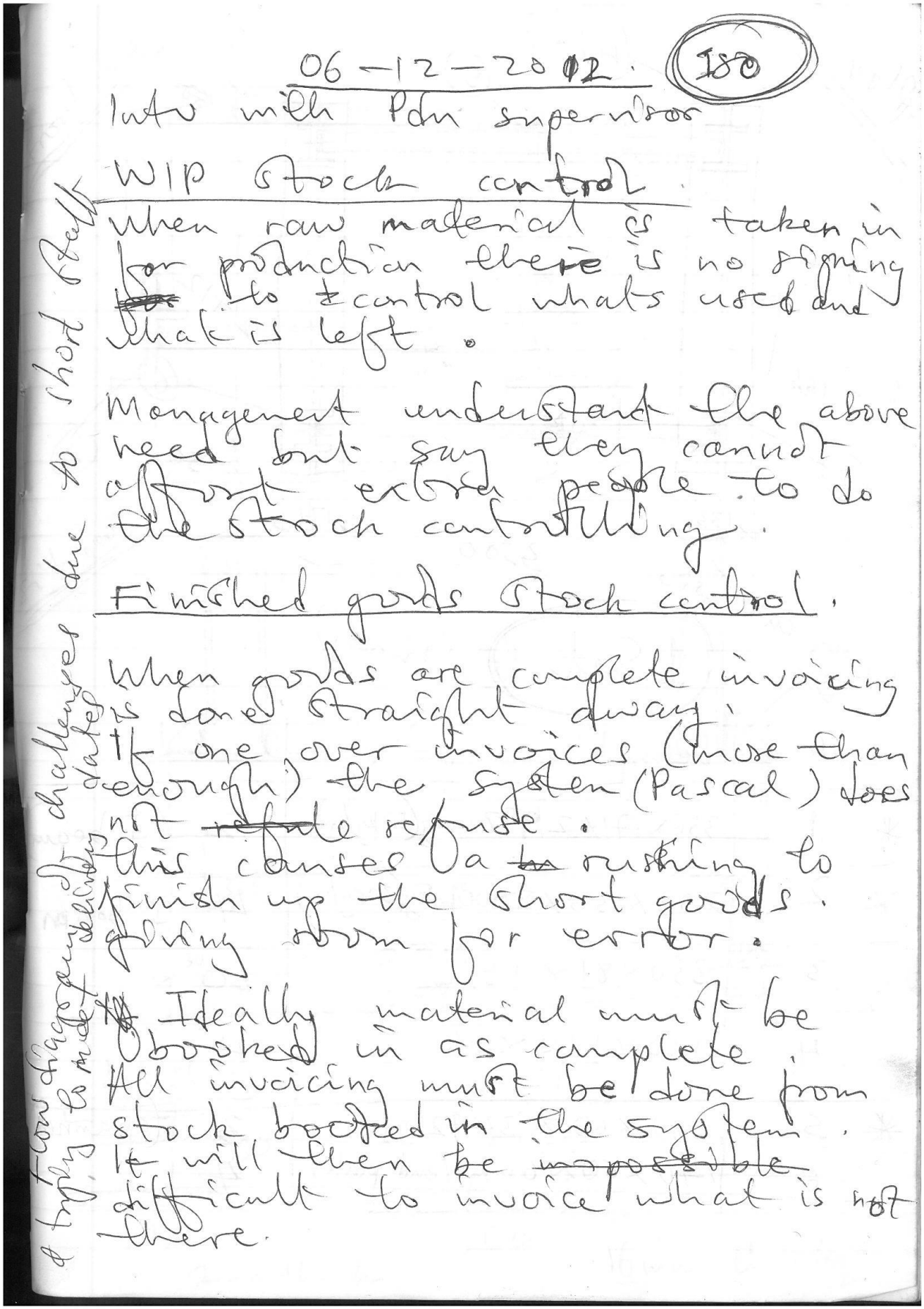
-To avoid diverting the mger's focus maybe directors or owners should manage from a systems perspective not manage a person Systems engineering.

It seems as if two things happen psychologically
① People not confident of passing hence maintain the old system to avoid going back to old ways after failing the new system (ISO 9000)

② Fear it may lead things out of control so they must gradually ingraft it in

Fortunately ISO does not come for radical changes but to smoothen/authenticate what you are already doing.

Appendix 10: Stock Management



06-12-2002. ISO

Intv with Pdn supervisor

WIP Stock control.

When raw material is taken in for production there is no signing to control whats used and what is left.

Mongement understand the above need but say they cannot afford extra people to do the stock controlling.

Finished goods Stock control.

When goods are complete invoicing is done straight away.

If one over invoices (more than enough) the system (Pascal) does not refuse refuse.

This causes a rushing to finish up the short goods. giving room for error.

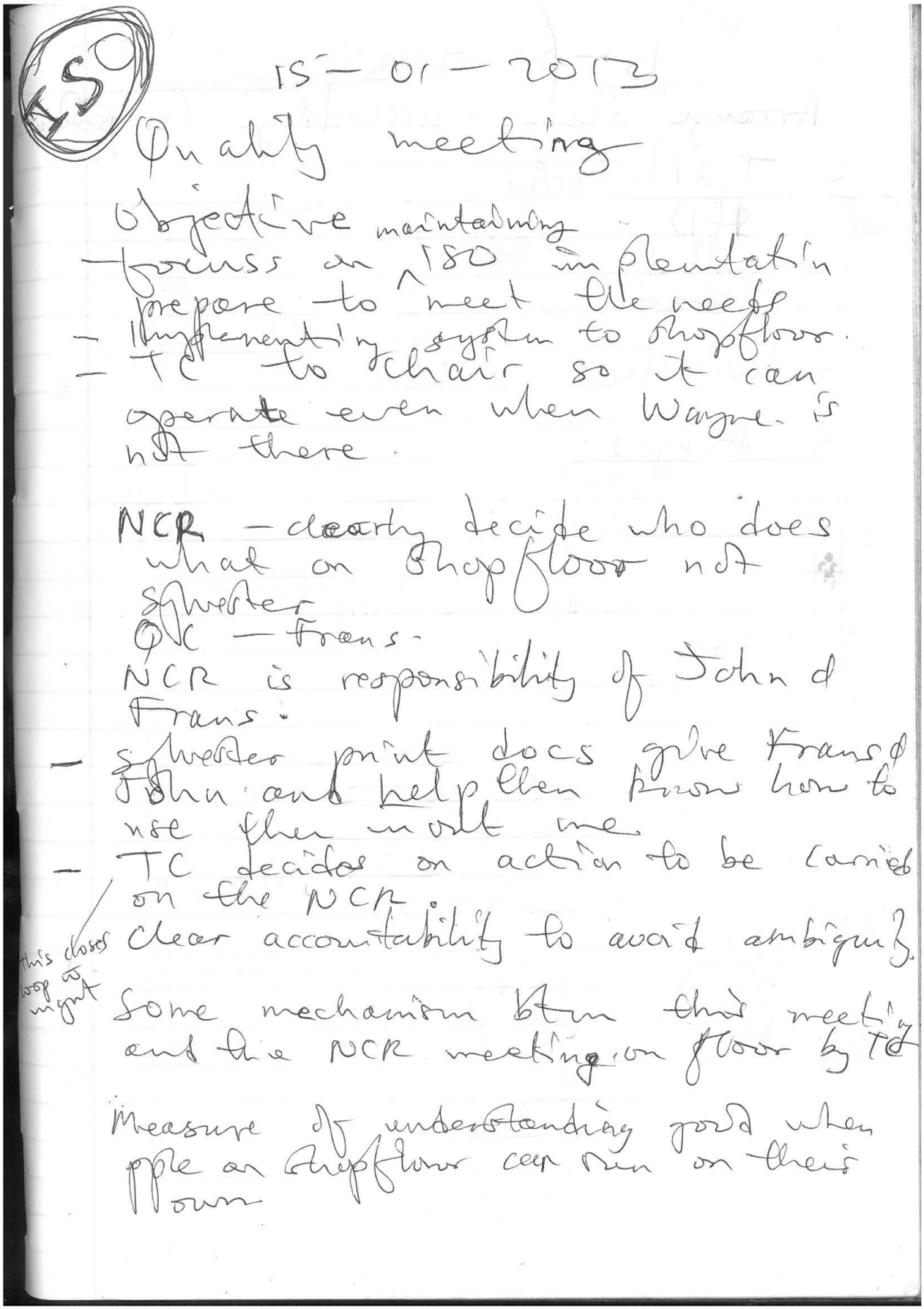
Ideally material must be booked in as complete.

All invoicing must be done from stock booked in the system.

It will then be impossible difficult to invoice what is not there.

Flow diagram is needed to help visualise the challenges due to short staff & trying to meet deadlines

Appendix 11: NCR Management



15-01-2013

Quality meeting

Objective maintaining
- focuss on ISO implentation
prepare to meet the needs
- Implementing system to shopfloor.
- TC to chair so it can operate even when Wayne is not there

NCR - clearly decide who does what on shopfloor not sylvester
QC - Frans.
NCR is responsibility of John & Frans.
- sylvester print docs give Frans & John and help then know how to use then visit me
- TC decides on action to be carried on the NCR

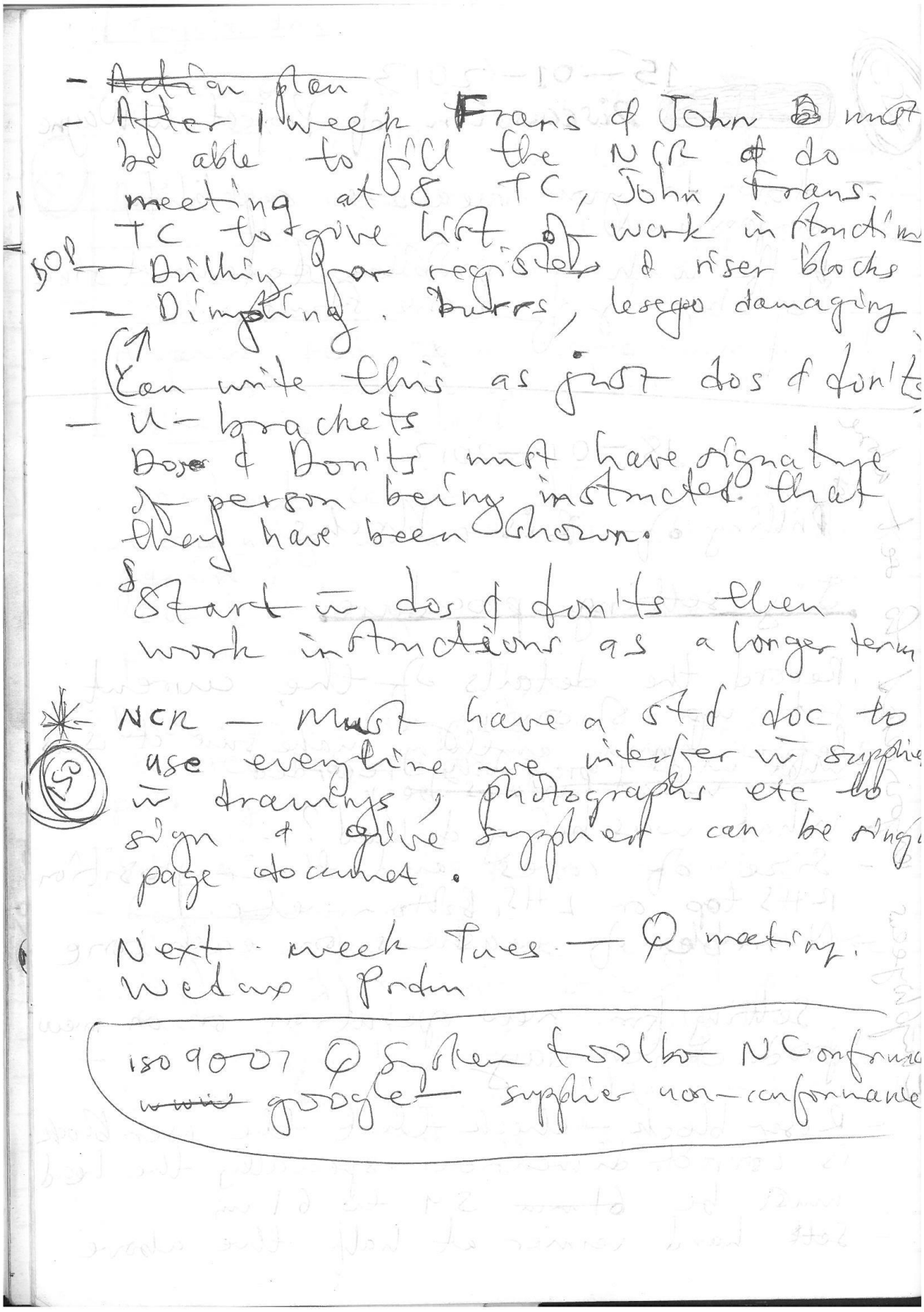
this closes loop to right

Clear accountability to avoid ambiguity.

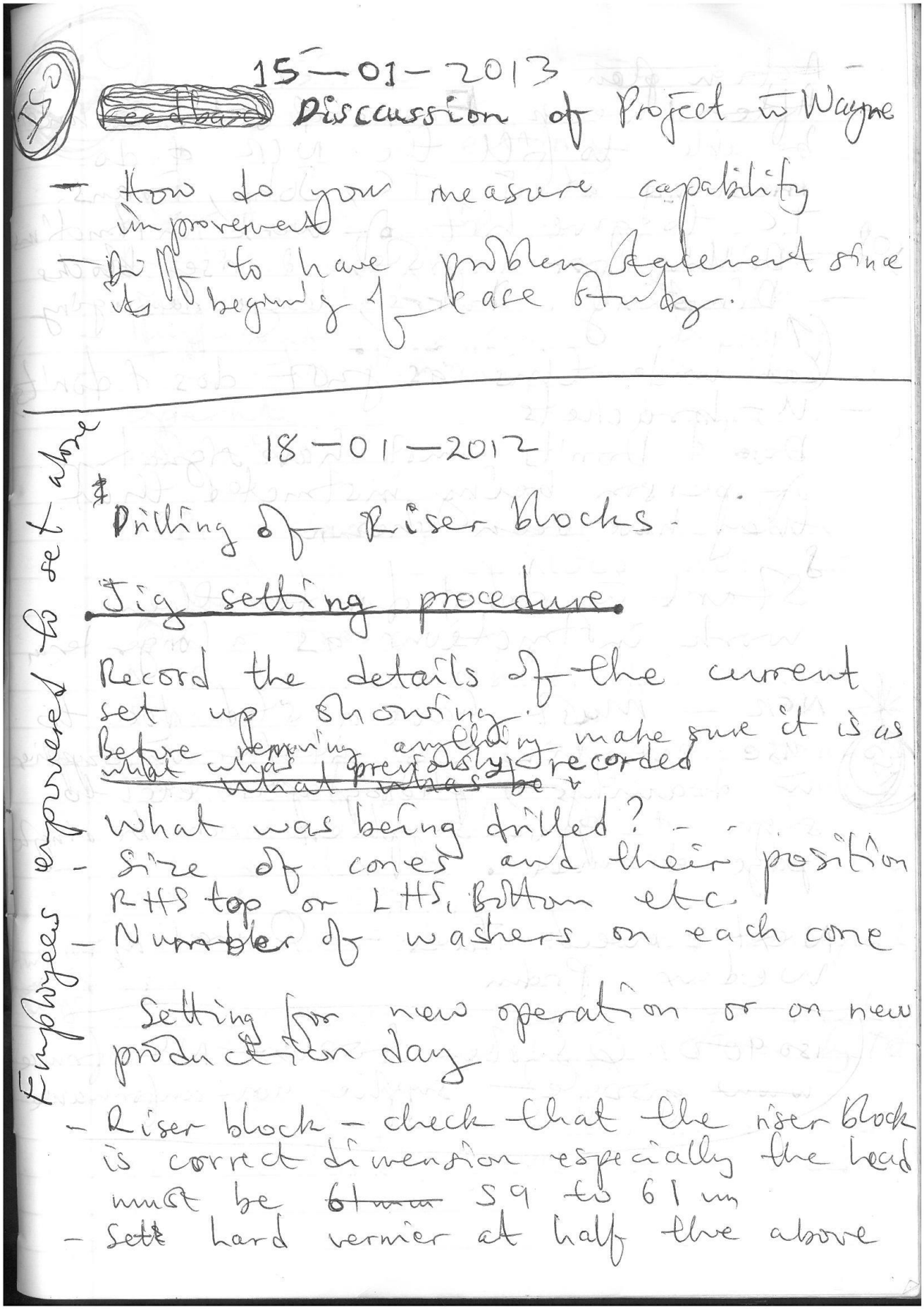
Some mechanism btw this meeting and the NCR meeting on floor by TC

Measure of understanding good when ppl on shopfloor can run on their own

Appendix 12: Process Management



Appendix 13: Drilling Machine Jig Setting Procedure



15-01-2013

Discussion of Project w Wayne

- How do you measure capability improvement
- If to have problem statement since its beginning of case study.

18-01-2012

Employees expressed to set above

Drilling of Riser blocks.

Jig setting procedure

Record the details of the current set up showing.

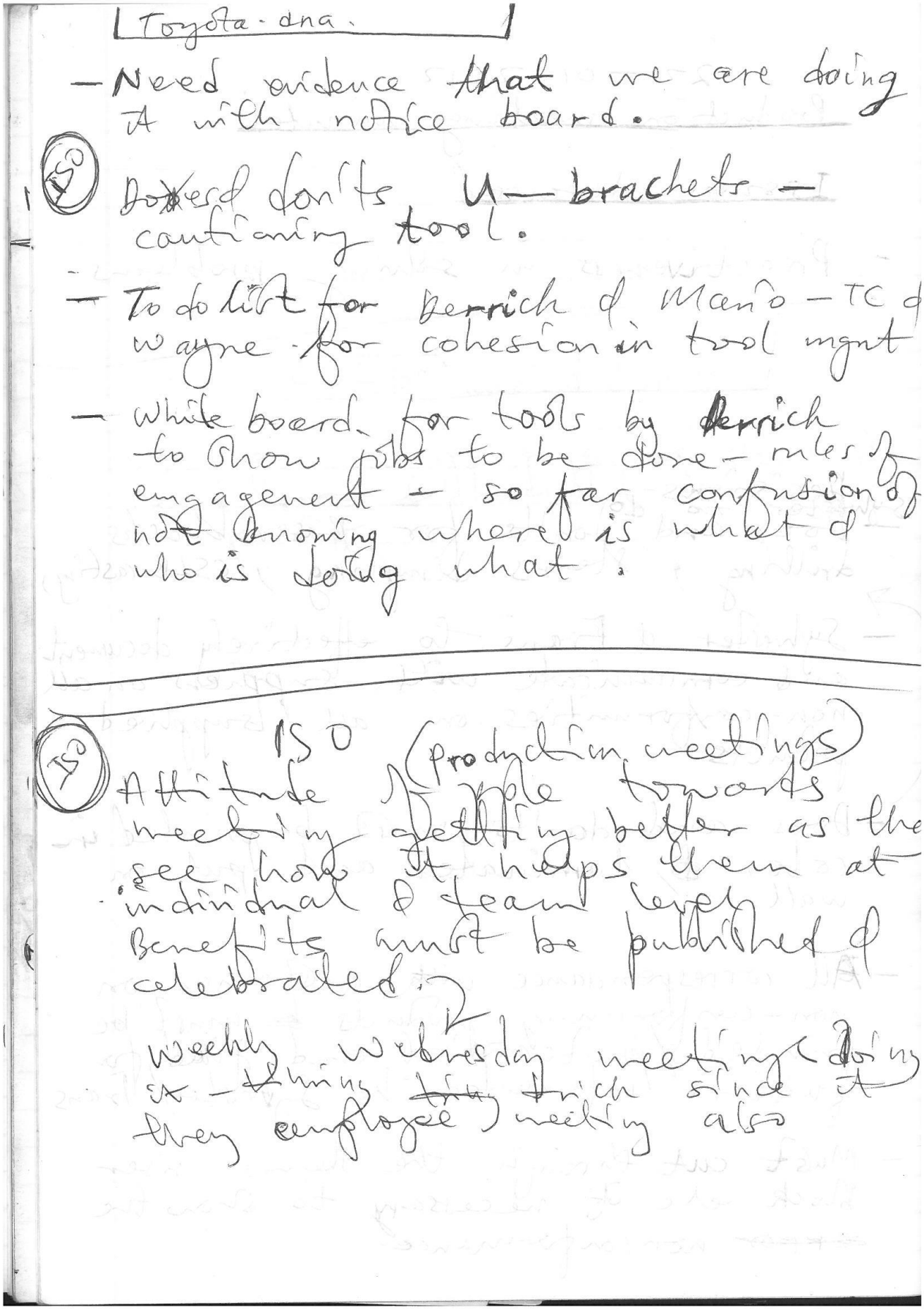
Before removing anything make sure it is as what was previously recorded ~~what it was be~~

- What was being drilled?
- Size of cones and their position RHS top or LHS, Bottom etc.
- Number of washers on each cone

Setting for new operation or on new production day

- Riser block - check that the riser block is correct dimension especially the head must be ~~6~~ 59 to 61 m
- Set hard vernier at half the above

Appendix 14: Attitude towards Meetings



Toyota dna.

- Need evidence that we are doing A with notice board.

(5S) Board dots, U— brachets — confining tool.

- To do list for Derrich & Mano – TC & wayne for cohesion in tool mgnt
- White board for tools by Derrich to show jobs to be done – rules of engagement – so far confusion of not knowing where is what & who is doing what.

(5S) ISO (Productive meetings)

Attitude people towards meeting getting better as the see how it helps them at individual & team level

Benefits must be published & celebrated.

Weekly wednesday meeting (doing it – thing which end & they employee) meeting also

Appendix 15: External Interview Questionnaire

1. When you made the decision to get ISO 9000 accreditation, what could have been the four main benefits you expected to get from it?
2. Did you achieve the level of improvement you expected in these benefits?
3. If there is no to part of answers on question 3, what do you think could have been the problem?
4. What were the four major challenges you met during implementation?
5. What are the four challenges you still meet as you try to remain compliant/certified?
6. On a scale of 0 to 10 (with being the score for when ISO 9000 has been very helpful to your organization), how would you rate the usefulness/benefits of ISO 9000 to your company?
7. In terms of day-to-day activities/environment of the shop floor, what level of change was attained on employee behavior?
8. Looking at the table below, how would you summarize your company's time allocation during ISO 9000 implementation (in percentage)?

Inputs	**Transformation/Processing**	**Outputs**
paperwork, stock management, buying, storage	Raw material conversion to outputs, process improvement, operator training etc.	Invoicing, delivery

9. Lastly, what are the 4 Dos and Don'ts you would tell to a company embarking on ISO 9000 implementation?

THANK YOU

Appendix 16: External Interviewees Contacts and Organization

	Organization; years of certification & Company year establishment	Type of business	Person interviewed	Interview date	Venue/ contact
1	Conbraco (7) Est-1987	Manufacture of braking equipment for Transnet	Richard Child (MD)	16 September 2014	14 Dobson st, Chamdor, Krugersdorp Tel: 0117622421
2	Duvha Foundry (1) Est- 2012	It is a casting manufacturing business producing castings in chrome Iron, Steel and stainless steel alloys	Stanley Tshivashe (MD)	16 September 2014	39 Adcock St, Chamdor; Krugersdorp; Tel: 0117621557
3	Rand Air (5) Est- 1975	Compressed air and generator sales and hire	Bongani Thobela (SHEQ manager)	8 October 2013	Cnr Commercial and Dekemard, Wadeville Tel: 0113450700
4	Pump Abrasives (3) Est-2005	Supply and servicing of different industrial and domestic pumps	Graham Dougall (MD)	14 October 2013	299 Baralong st, Icon Industrial Park, Centurion Tel: 0126660904/5
5	LVSA (14) Est- 1994	Supply and servicing of mining and industrial valves	Seelan Pillay (Manager)	5 November 2013	46 Kindonrd; Robertsham Tel: 0116802005
6	TVM valves (2) Est- 2002	Supply and servicing of mining and industrial valves	Swatam (Manager)	17 February 2014	46 Kindonrd; Robertsham Tel: 0116801050

Appendix 17. Internal Interview Questions

LAURSENS ENGINEERING – INTERNAL INTERVIEWS ON ISO 9000

DATE_17/2/2014_DURATION_Different (5min average)_POST_Various_EMPLOYMENT PERIOD Varying from 2 to 15years

1. What is ISO 9000 to you?
2. Has ISO 9000 improved anything on your job or work environment? Examples?
3. Do you have the support you need to reach your objectives?
4. What other improvements do you want?
5. Do you regularly get useful feedback from management?
6. Are you given opportunities to develop?
7. On a scale of 0-5 (with 0 being equivalent to the standard not being helpful and 5 being equivalent to the standard being very helpful) was ISO 9000 useful on first offs and checking fixtures to product quality?

Appendix 18. Internal Interview Candidates

Internal interview candidates

Date of interview – 17/02/2014

Candidate	Post	Age group	Years with SME	Comments
1	Workshop supervisor	55-65	15	None
2	QC officer	45-55	10	None
3	Senior welder & operator	45-55	10	None
4	Tool room supervisor	45-55	9	None
5	Senior press operator	35-45	7	English language barrier had to use Zulu
6	Welder & trainee supervisor	25-35	2.5	None
7	Press operator	25-35	6	None
8	Senior tool setter	25-35	2.5	None
9	Junior tool setter	25-35	2	None
10	Junior press operator	25-35	1.5	None
11	Senior welder	55-65	7	Refused interview said I know nothing about ISO 9000 and quality

Appendix 19: Non-conformance Reports Statistics

		Date opened	Date closed	Source	Did problem reoccur in 3 Months	Number of weeks before closing NCR
2012	1	**01-Oct**	01/04/2013	customer	yes	26.00
	2	19-Oct	05/03/2013	customer	yes	24.00
	3	03-Nov	01/04/2013	Internal	yes	22.00
	4	05-Nov	08/04/2013	Internal	no	23.00
	5	05-Nov	08/04/2013	Internal	yes	24.00
	6	5/11	12/02/2013	supplier	yes	5.00
	7	07-Nov	12/12/2012	supplier	no	6.00
	8	03-Dec	11/01/2013	supplier	no	2.00
	9	09-Nov	20/11/2012	Internal	no	0.00
	10	11-Dec	12/12/2012	Internal	no	16.00
	11	15-Jan	04/12/2013	supplier	yes	1.00
	12	22-Jan	29/01/2013	Internal	yes	8.00
	13	24-Jan	11/03/2013	supplier	yes	1.00
	14	28/01/2014a	08/02/2013	Internal	yes	5.50
	15	28/1/2013b	29/2/2013	Internal	no	3.00
	16	28/1/2013c	18/02/2013	Internal	yes	5.00
	17	29-Jan	04/03/2013	supplier	yes	0.00
	18	30-Jan	30/01/2013	Internal	yes	0.00
	19	31-Jan	01/02/2013	Internal	no	0.00
2013	20	13-Feb	14/02/2013	supplier	no	0.00
	21	27-Feb	28/02/2013	Internal	yes	0.00
	22	28-Feb	01/03/2013	supplier	yes	0.50
	23	05-Mar	10/04/2013	supplier	yes	0.50
	24	28-Mar	01-Apr	supplier	yes	0.50
	25	04-Apr	not yet	Internal	yes	Average 7.21
	26	10-May	not yet	Internal	no	
	27	24-May	not yet	supplier	yes	
	28	05-Aug	not yet	supplier	no	
	29	27-Aug	not yet	supplier	yes	
	30	27-Aug	not yet	supplier	yes	
	31	06-Sep	not yet	supplier	yes	
	32	09-Sep	not yet	supplier	yes	
	33	28-Nov	yes-no date	Internal	no	
	34	08-Nov	not yet	Internal	yes	
	35	08-Nov	not yet	Internal	yes	
	36	12-Nov	not yet	Internal	yes	
	37	20-Nov	not yet	Internal	yes	
	38	25-Nov	not yet	Internal	yes	
	39	20-Nov	not yet	Internal	yes	
	40	05-Dec	not yet	Internal	yes	
2014	41	20-Jan	not yet	internal	n/a	
	42	21-Jan	not yet	internal	n/a	
	43	28-Jan	not yet	internal	n/a	

Appendix 20: Total Monthly NCRs

Year	Month	Number of NCR
2012	SEPTEMBER	0
	OCTOBER	2
	NOVEMBER	6
	DECEMBER	2
2013	JANUARY	9
	FEBRUARY	2
	MARCH	2
	APRIL	1
	MAY	1
	JUNE	0
	JULY	0
	AUGUST	3
	SEPTEMBER	2
	OCTOBER	0
	NOVEMBER	7
	DECEMBER	0
2014	JANUARY	3
	FEBRUARY	0

Appendix 21: CSLB Reject Rate

CSLBs DELIVERED IN 2013-2014

DATE	INVOIVE	NCR number	Total CSLBs delivered	Total rejected	NCR Ref no	Percentage rejected (%)
Feb-28	70021	Mar-28	641.00	116.00	Mar-28	18.09672387
Aug-27	73547	Aug-27A	275.00	100.00	Aug-27A	36.36363636
Aug-27	70021	Aug-27B	641.00	127.00	Aug-27B	19.81279251
10-Sep	74012	Sep-06	120.00	22.00	Sep-06	18.33333333
22-Oct	74903	Oct-18	529.00	168.00	Oct-18	31.75803403
07-Feb	75713 & 75561	Feb-06A	314.00	100.00	Feb-06A	31.84713376
07-Feb	75708 & 75560	Feb-06B	262.00	96.00	Feb-06B	36.64122137

Appendix 22: Monthly Supplier Reject Rate

MONTHLY SUPPLIER REJECT RATE	
Month	**% Reject**
FEB	18.1
MAR	0
APR	0
MAY	0
JUN	0
JUL	0
AUG	28.1
SEP	18.3
OCT	31.3
NOV	0
DEC	
JAN	
FEB	34.2

Appendix 23: Early Stages of Weekly Quality Minutes

MINUTES FOR WEEKLY PRODUCTION QUALITY MEETINGS

→ Winches frame Do & Don'ts.

Date: 29 January 2013

Venue: Laursens boardroom

Present: Wayne, TC Botha, Sylvester, John and Frans.

Issues discussed:

- Dos and Don'ts must continue to be done for all production operations by Sylvester
- CSLB casting stock level very low Finished Stock

Decisions made

- ❖ Sylvester to urgently provide at each respective work station Dos and Don'ts for:
- Riser blocks drilling. — Expedite.
- Stems dimpling --- DONE.
- CSLB casting pivot hole drilling (DONE), mounting hole punching and last mounting hole drilling.
- ❖ Any production problem experienced in the workshop must get a DOs and DON'Ts within 24 hours.
- ❖ Sylvester must have a file for all DOs and DON'Ts released into the workshop
- ❖ TC, Sylvester and John to get a list of what must be done within the next three Months and priories especially DOs and DON'Ts, Lockable cabinet for Frans, etc
- ❖ TC and Sylvester to make two checking fixtures for diameter of standard and heavy duty stems and for riser block internal diameter. Discuss w Derick or Mario.
- ❖ TC, Frans and John to shift daily quality meetings from 8am to 9:15 after tea.
- ❖ Sylvester and Frans to document and communicate with suppliers of stems which are not to specification Do same for Hot forge thick neck.
- ❖ Evidence for all non-conformances (internal and external) must be filled for future appraisal purposes by Sylvester and Frans.
- ❖ TC and Wayne to buy an A3 laminating machine for laminating Dos and Don'ts and other document which need waterproofing. — TC to get one for 799
- ❖ TC to organize a diary for daily quality meeting recordings ✓
- ❖ Wayne to get a new camera for the company ✓

- White boards sizes for Dos & Don'ts.

NEXT MEETING – 5 February 2013 ~~10:00~~ am

Location: Laursens boardroom

Agenda items:

- Update on above decisions made
- Any opportunities for quality improvement

There must be a separate file for feedback from customer for future reference.

THANK YOU

Appendix 24: Latest Weekly Quality Minutes

MINUTES FOR WEEKLY PRODUCTION QUALITY MEETINGS

Date: 11 Feb 2014 **Time:** 11:30am

Venue: Laursens boardroom.

Items on agenda:

- Reflect on topic of the week
- Updates on above action.
- Go through outstanding NCR's
- Discuss critical area's for problem solving
- Topic for next week – **Spacers and Red Tags – one area at a time**
- Focus points**: Process ownership**

Present: ~~Wayne~~, TC Botha, Sylvester,Tyron, John, Frans and Robson.

Item	Decisions made	Action for:
1	Finalise any missing items on the drawings and put authorisation stamp on completed drawings before setting up the drawing management system. - Tyron and Sylvester to review drawings and develop action list Wayne to set up second meeting with Antony.	Tyron, Wayne, Sylvester
2	All items (spacers and inserts) must be numbered and recorded into a register. Consult with all involved people on how to implement. TC to talk with Mario. Meeting to be held on Tuesday 4 Feb around i) Clearing press tool & ii) U-bracket forming tool	Mario, Derrick & Tyron
3	Document current work improvement for future reference and continuous improvement like: i) 8" frame Winch forming checking fixture. ii) Control panel, iii) Stoppers for 65 Hinge pressed.- History to be logged – TC/Tyron **Still to do**: i) Eco Winch ii) 2'' winch	Sylvester, Tyron, Frans and TC
4	Shelf must represent all production stages of each product. WIP, Tyron to be involved for learning purpose. Decide on colour of shelf, remove old paint	John , Tyron, Frans & Robson
5	Complete Do's and Don't for Painting	Tyron, John, Frans
6	Make checking fixutre for CSLB's	Tyron, Mario, Fans
7	Sort through CSLB's and decide on way forward	Frans, TC, Tyron
8	Raise NCR's for the following: i) 2'' winch ii) 5'' standard winch (skew winch tube) iii) Welding Winch Pawl on Eco frames after the the ratchet has been welded	Tyron, Frans
9	Revise drawing for Connector tube blank	Tyron
10	Red Tag Day – Fill quarenteen bins (have dedicated bin)	Wayne, TC
11	Need to decide what we are going to label tools with. Name plates, and naming system to be decided	TC, Tyron

NEXT MEETING: 17 February 2014 **Time:** 12:30pm

Venue: Laursens boardroom.

Appendix 25: Non-conformance Report Master Form

laursens engineering	**Document name**	**Corrective action**
	Document Number	DC-CA-01
	Date Updated	1 September 2012
	Revision Number	0
	Page	1of 1
	Authorised by	TC Botha
	Date Authorised	1 September 2012

Date		Created By		
Non conformance Type	Customer	Internal	Supplier	NCR ref:

1. What is the Non Conformance?
2. What correction / Quick Fix do we need? Immediate action taken
3. R.C.A (Root Cause Analysis): What is the cause of the problem
4. Corrective Action : Action taken to resolve the problem and to prevent its re occurrence
5. Effectiveness : Was the action taken successful ?

Corrective action closed out : Yes/No	Date corrective action closed out:
Signed by Management Representative	Signed by Management

Appendix 26: Supplier Non-conformance Report

Laursens Engineering (Pty) Ltd
Reg No CK1998/014318/23 VAT 4210172393
PO Box 764
Wierda Park, 0149
Tel : +27 12 666 9090 Fax : +27 86 527 8882
e-mail: info@laursens.co.za www.laursens.co.za
Address: 129 Ellman St, Sunderland Ridge, Centurion

Supplier Non-conformance Report

IDENTIFICATION			
1. Originator Name:	FRANS & SYLVESTER	6. Date:	24/05/2013
2. Contractor/Supplier:	GUESTRO	7. NCR No:	MAY -24
3. Order No:	70021	8. Quantity:	STILL SORTING
4. Part description:	CSLB castings	9 Drwg No:	
5. Part number:			

10. Found during what activity:	
☒ Incoming inspection	☐ Final inspection
☐ WIP/In-process inspection	☐ Other (specify)

11. Non-conformance description

Head heights of the CSLBs are not as per drawing specification of ~~same~~ 50,5-52,5mm. Some are too low and some are too high as per attached picture.

DISPOSITION			
12	☐ Use-as-is	☒ Return to supplier	Responsible Manager
	☐ Repair	☐ Reject	Name: TC Botha
	☐ Rework		Date: 24/05/2013 Signature:

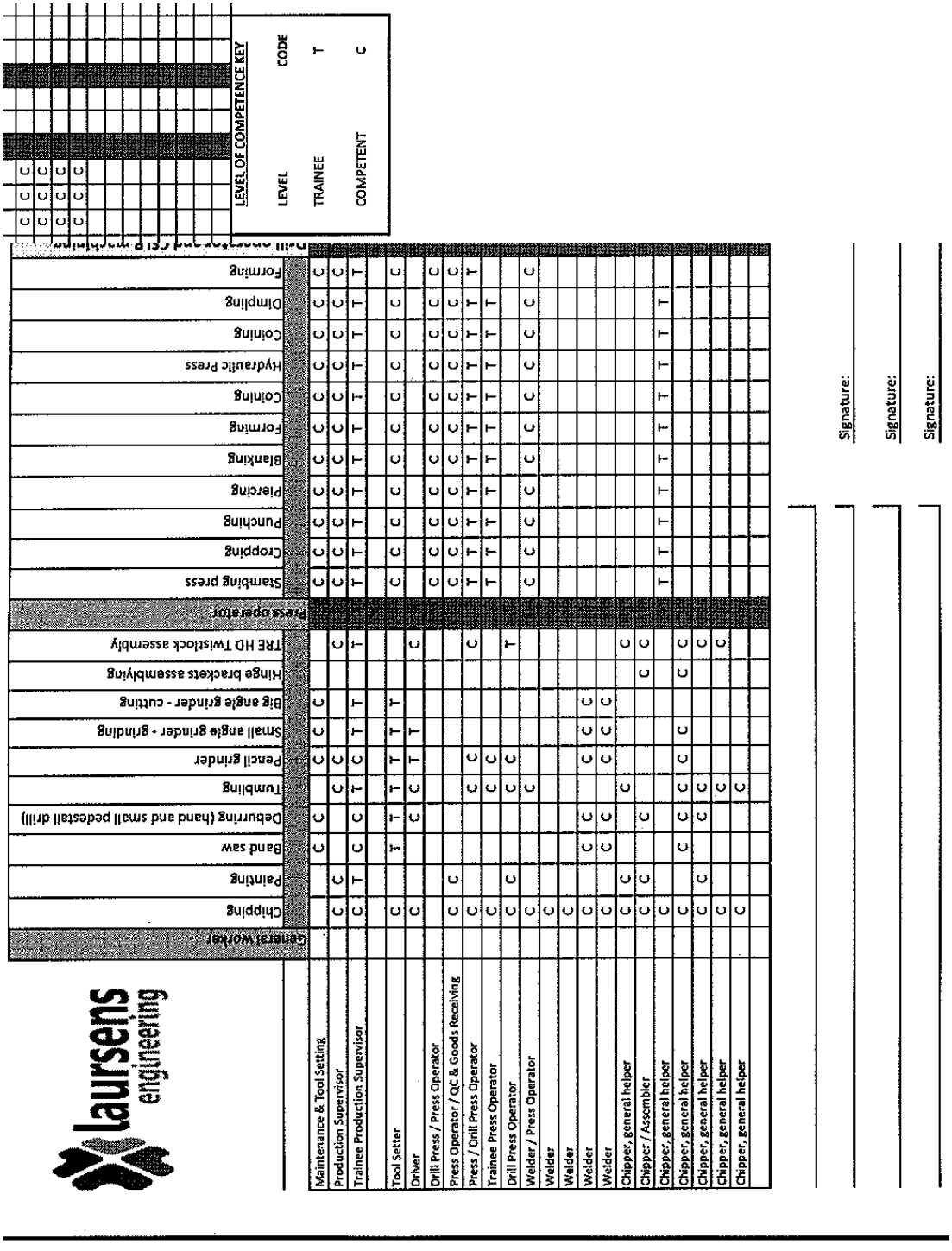
13. Supplier response

14. Supplier contact person

Name:	Signature:	Date:

PLEASE REQUEST PHOTOS, DRAWINGS OR ANY EVIDENCE IF NOT SUPPLIED

Appendix 27. Skills Matrix Chart (sample not complete chart)



Appendix 28. Quality Commitment Document

Laursens Engineering (Pty) Ltd
Reg No CK1998/014318/23 VAT 4210172393
PO Box 764
Wierda Park, 0149
Tel : +27 12 666 9090 Fax : +27 86 527 8882
e-mail: info@laursens.co.za www.laursens.co.za
Address: 129 Ellman St, Sunderland Ridge, Centurion

COMMITMENT TO QUALITY

I HEREBY ACCEPT THAT IT IS MY RESPONSIBILITY TO

ADHERE TO THE FOLLOWING:

1. The QC officer must be called to sign and identify the first-off by means of a "first-off" sticker before commencing with production. No production can start without a signed first-off.
2. The go / no-go gauge must be at the press or work station at all times (if one is available). It is the press operator or welder's responsibility to enquire whether such a gauge is available for the operation to be performed and to get it from the QC officer.
3. The quality check sampling rate and use of the go / no-go gauge must be confirmed with the QC officer before commencing with production.
4. The do's and dont's must be signed off before starting the operation to be performed. Every time a press has been set up, the operator must revisit the do's and don't's with production supervision even before the first-off is produced.
5. The last-off must be kept aside by the press operator and identified by the QC officer by means of a "last-off" sticker. The last-off will be used in conjunction with an open tool inspection to determine the condition of the tool before being put in the bin with the other components.
6. If at any stage you are unhappy with the quality of the component being produced and you feel you shouldn't carry on, you must stop and tell your supervisor.

Name: Hesego Masunyane

Signature: HS Masunyane

Date: 05/06/13

Appendix 29. Welding Output

Name JAMES Wk _____ Operation _____

Monday 17 Operation	Time Start	Time End	Qty	Comments
TUBES WELDING	07 35	08 29	74	
CLEANING	08 29	08 55		
PRES PUSH	08 50	11 10		
MEETING	11 15	12 20		
CHIPPING	12 55	16 30		

Tuesday 18 Operation	Time Start	Time End	Qty	Comments
Eco DBH T	07 39	09 17	19	
Eco DBH F	09 20	10 58	19	
CHIPPING	11 00	14 08		
PRESS PUSH	14 01	14 48		
CHIPPING	14 50	16 15		
PRESS PUSH	16 17	16 30		

Wednesday 19 Operation	Time Start	Time End	Qty	Comments
TBC P	07 30	14 47	356	
LASH PLATE PROB	14 47			
CHIPPING	15 16	16 11		
TBC P	16 13	16 30	25	

Thursday 20 Operation	Time Start	Time End	Qty	Comments
TBC P	07 30	11 15	216	
TBC H JIG FIX	11 20	12 30		
TBC H	12 38	14 12	25	
CHIPPING	14 16	16 30		

Friday 21 Operation	Time Start	Time End	Qty	Comments
CHIPPING	07 30	08 21		
GRINDING TUBE	8 22	10 30		
PARA HANDLE	10 39	13 30	90	

Saturday Operation	Time Start	Time End	Qty	Comments

Inhouse Skills Development - Training Log

Trainee name: Rosero

Date	Description of task	Trained by	Start time	End time	Duration	Comments
11.02/13	Surface grind base	Mario	11h00	12h00	1	
11-02/13	Forguideline tool	Mario	12:30	16:30	4.	
15.02.2013	Surface grind	Mario	11:30	13:30	2	
25.02.2013	Surface grinding	Mario	14:20	16:30	2	
28:02:13	Surface grinding	Mario.	11:30	12:00	½	
01:03:13	Surface grinding	Mario	12:30	13:30	1	
07/03/13	Surface grinding	Mario	12:45	14:30	1 3/4.	
13/03/13	Milling corners onto std. top plate	Mario	7:30	16:30		
14/03/13	" "	Mario	7:30	9:30.		
27/03/13	Surface grinding ect punch tool top plate	Mario	8:30.	9:00		
			9:10	14:16		
02/04/13	Rotha training & turning 0-2 1/2 Ø40 Stem	Rosero.	13:42	16:30		
03/04/13	" " " "	" " "	07:30	16:30		
04/04/13	" " "	" "	07:30	09:00.		
09/04/13	Surface grinding	Mario	09:10	10:00		
10/04/13	Surface grinding	Mario	12:30	13:45.		
12/04/13	Surface grinding	Mario	07:30	08:16		
16/04/13	Surface grinding.	Mario	13:32.	14:50		
17/04/13	Surface grinding	Mario	08:15	09:00		
" "	" "	" "	10:00	11:05		

Appendix 31. Management Representative Appointment

laursens engineering	**Document name**	**Appointment**
	Document number	PL-appointment-01
	Date Updated	++++++
	Revision Number	0
	Page	1of 1
	Authorized by	++++++
	Date Authorized	++++++

This document serves to confirm the appointment of:

++++++++++++

As management representative for the ISO 9001:2008 quality system

This position has the freedom and authority to initiate action to prevent non-conformity, and will report on the performance of the quality system at management reviews. This is used as a basis for improvement to the quality system

The Management Representative will promote quality awareness at all times.

His/her responsibilities will be as follows:

a) Ensuring that processes needed for the quality management system are established, implemented and maintained,

b) Reporting to top management on the performance of the quality management system and any need for improvement, and

c) Ensuring the promotion of awareness of customer requirements throughout the organization.

NOTE: The responsibility of a management representative can include liaison with external parties on matters relating to the quality management system

This appointment is effective immediately

Accepted by: ++++++

Date: ++++++++++++

Signed: ++++++++++

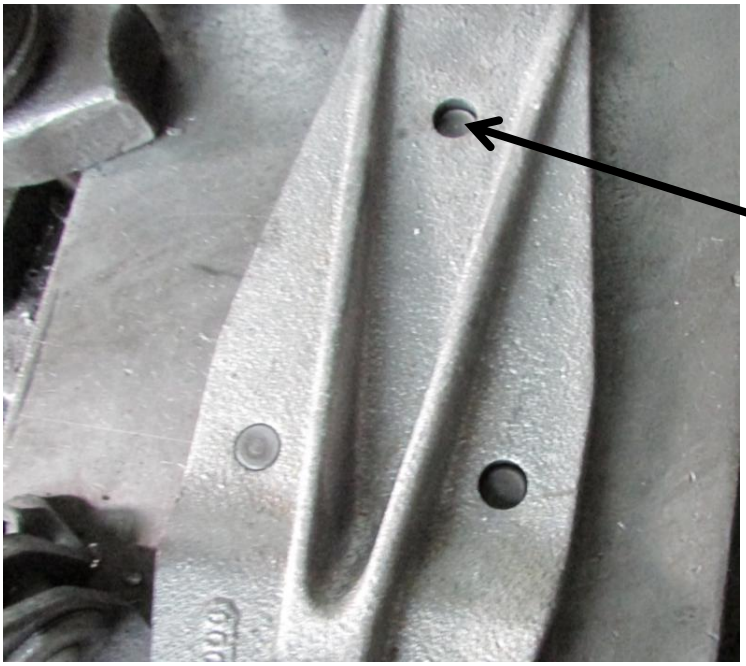
Appendix 32. An example of Workshop Dos & Don'ts

Compiled By	:	++++++++++++++++++
Authorized By	:	++++++++++++++++++
Effective Date	:	26 MARCH 2013
Revision No: 00		Document No: LE-DDDMH-01

DOs AND DON'Ts FOR DRILLING 4th MOUNTING HOLE ON CSLBs

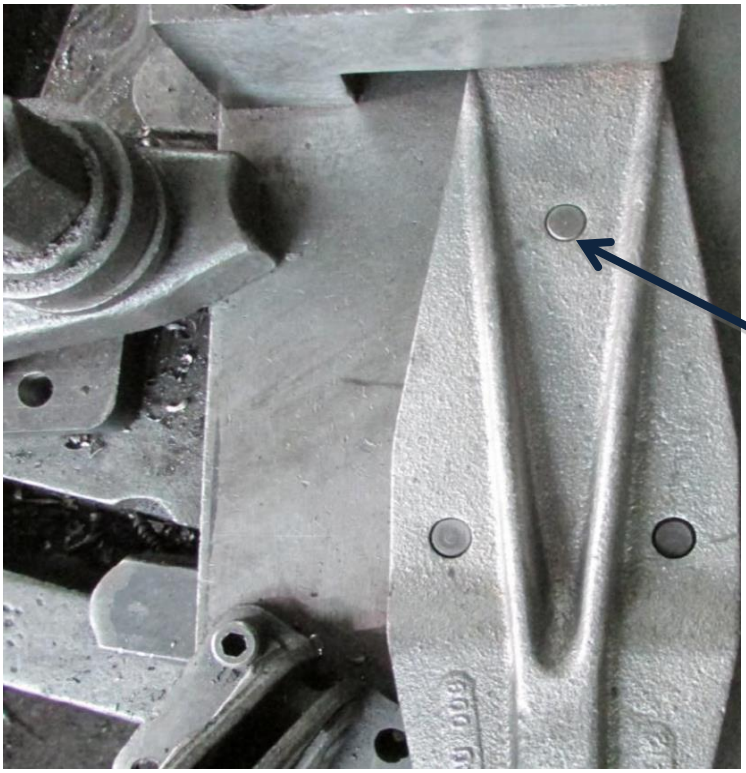
DURING DRILLING

- Do not proceed if the locating pins fall through the jig as shown below, call the QC officer.



Locating pins not helping to align holes. The pins must appear on top of the CSLB surface

- Only proceed when the locating pins are fully appearing as shown below.



Locating pins must fully appear and help align the holes

Appendix 33. Product Quality Continuous Improvement Report

(A compressed version showing all detail, normal document is three pages)

Product Quality Continuous Improvement Report

IDENTIFICATION	
1. Product Name:	**3.** Date:
2. Process involved:	**4.** Document No: LE-PQCIR-01

5. Improvement team members involved

6. Original state or attributes

7. Action taken or changes made

8. New quality attributes achieved

9. Challenges which must still be worked on

10. Manager or Supervisor

Signature:	Date:

PICTURE BEFORE	PICTURE AFTER