LEVERAGING SHOP FLOOR MANAGEMENT TO CREATE AN ORGANIZATION OF SELF MANAGED PEOPLE AT SA CANOPY

BY

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DECLARATION

“I, Jacques Swart, hereby declare that:

• The work in this dissertation is my original work;
• All sources used or referred to have been documented and recognised; and
• This dissertation has not been previously submitted in full or partial fulfilment of the requirements for an equivalent higher qualification at any other recognised education institution”.

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JACQUES SWART                      DATE
ABSTRACT

All world class manufacturing organizations have shop floor management in place. Shop floor management principles and tools are utilised to plan and to react in out of control conditions. Shop floor management is also utilised to involve people in decision making and to encourage continuous improvement.

Various shop floor management principles exist and are applied differently depending on the nature of the business, however all these principles are present in all the companies researched.

SA Canopy currently applies very little or no shop floor management principles. To be able to achieve its objectives and mission set by the new shareholders, shop floor excellence must be achieved.

The objective of the study was to establish shop floor management principles utilised by the automotive industry as well as best in class organizations. To achieve this, a comprehensive literature study was performed on shop floor management.

A questionnaire and audit schedule was designed based on guidelines in the literature study in order to establish what shop floor management principles are being utilised in the industry. The researcher used random sampling methods in distributing the questionnaire. An internal audit of the companies was conducted to support the responses in from the questionnaires.

The opinions of the various respondents were compared with the guidelines provided in the literature survey in order to indentify shop
floor management principles which would be suitable for SA Canopy.

The following main recommendations were made:

- In order for SA canopy to achieve its objectives the company needs to develop a mission statement for everyone to work towards.

- SA Canopy needs to become more customer and supplier orientated. This will improve the overall performance of the business in respect of cost, quality and output.

- It is important that SA Canopy promotes teamwork so as to create a culture of continuous improvement.

- Problem solving skills need to be developed in the organization.

- Roles of Supervision need to be clearly defined and development programmes need to be put in place for supervision.

- A management process similar to the “Plan, Do, Check, Action “needs to be put in place to ensure effective actioning and monitoring of improvements and performance of stakeholders
ACKNOWLEDGEMENTS

In the compiling of this dissertation, many individuals played a role to ensure its success. I would like to thank and honour them for their support, assistance and encouragement in this acknowledgement.

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- Mr. Bux Heather who provided guidance and encouragement during the course of my research.
- The companies that participated in the research.
- My wife, Jennie, for her support and encouragement.
TABLE OF CONTENTS

DECLARATION 2
ABSTRACT 3
ACKNOWLEDGEMENTS 5
TABLE OF CONTENT 6
LIST OF TABLES 10
APPENDIX A COVERING LETTER 86
APPENDIX B SHOP FLOOR QUESTIONNAIRE 87
APPENDIX C COMPANY AUDIT SCHEDULE 90

CHAPTER 1

INTRODUCTION, PROBLEM STATEMENT AND RESEARCH METHODOLOGY 11
1.1 INTRODUCTION 11
1.2 SA CANOPY 12
1.3 MAIN PROBLEM 12
1.4 SUB-PROBLEMS 12
1.5 DEMARCATION OF THE RESEARCH 13
1.5.1 GEOGRAPHICAL DEMARCATION 13
1.5.2 SIZE OF THE ORGANIZATION 13
1.5.3 MANAGEMENT LEVEL 13
1.6 DEFINITION OF KEY TERMS AND SELECTED CONCEPTS 14
1.6.1 SHARED VISION 14
1.6.2 OWNERSHIP BY PEOPLE 14
1.7 SIGNIFICANCE OF THE RESEARCH 15
1.8 RESEARCH DESIGN 15
1.8.1 LITERATURE SURVEY 15
1.8.2 EMPIRICAL STUDY 15
1.9 PROPOSED PROGRAM OF STUDY 16
1.9.1 SUMMARY 16

LITERATURE OVERVIEW 18
2.1 INTRODUCTION 18
2.2 WHY EXCELLENCE IN SHOP FLOOR MANAGEMENT?

2.3 APPLICATION IN THE AUTOMOTIVE INDUSTRY
   2.3.1 VISION FOR SHOP FLOOR EXCELLENCE.
   2.3.2 CUSTOMER ORIENTED ORGANIZATION
   2.3.3 INVOLVEMENT OF EVERYONE
   2.3.4 ESTABLISHING MINI COMPANIES / TEAMS
   2.3.5 THE ROLE OF FRONT LINE SUPERVISORS IN THE MINI-COMPANY / TEAMS
   2.3.6 VISUAL MANAGEMENT
   2.3.7 CONTINUOUS IMPROVEMENT PROCESS
   2.3.8 KEY POINT FOR ORGANIZATIONAL INNOVATION
   2.3.9 SHOP FLOOR EXCELLENCE

2.4 SHOP FLOOR MANAGEMENT PRINCIPLES APPLIED BY WORLD CLASS COMPANIES
   2.4.1 CLEAR VISION
   2.4.2 TOTAL EMPLOYEE INVOLVEMENT

2.5 UPGRADE SKILLS TO IMPROVE SELF MANAGEMENT
   2.5.1 MATCHING SKILLS WITH THE ORGANIZATIONAL NEEDS
   2.5.2 THE ROLE OF MANAGERS AND SUPPORT PEOPLE

2.6 PROBLEM SOLVING SKILLS

2.7 PROBLEM SOLVING TOOLS USED IN THE AUTOMOTIVE INDUSTRY
   2.7.1 AGREEMENT ON TARGETS AND DISCIPLINE TO FOLLOW UP
   2.7.2 DISCIPLINE IN THE WORKPLACE
   2.7.3 CROSS TRAINING / JOB ROTATION
   2.7.4 CHECKLISTS
   2.7.5 MINI COMPANY (QCSDM) SCOREBOARD
   2.7.6 STANDARD OPERATING PROCEDURES AT EACH WORK STATION
   2.7.7 TEN WORST SUPPLIERS
   2.7.8 AWARD PROGRAMS

2.8 APPROACHES FOR PROBLEMS SOLVING ACTIVITIES USED IN THE AUTOMOTIVE INDUSTRY
   2.8.1 STEPS FOR EFFECTIVE PROBLEM SOLVING

2.9 SUGGESTION PROGRAMS
2.10 MANAGING SHOP FLOOR IMPROVEMENT ACTIVITIES USED IN
THE AUTOMOTIVE INDUSTRY
2.10.1 GOAL SETTING
2.10.2 MANAGEMENT CYCLE
2.11 TYING SHOP FLOOR MANAGEMENT TO THE TOTAL BUSINESS
2.12 CONCLUSION

RESEARCH DESIGN AND METHODOLOGY
3.1 INTRODUCTION
3.2 RESEARCH DESIGN
3.3 CONDUCTING THE EMPHERICAL STUDY
3.4 SAMPLING METHODS AND SIZE
3.4.1 NON-PROBABILITY SAMPLING
3.4.2 PROBABILITY SAMPLING
3.5 DATA TYPES
3.5.1 DATA TYPES 1
3.5.2 DATA TYPES 2
3.6 THE QUESTIONNAIRE
3.6.1 THE DESIGN
3.6.2 VALIDITY AND RELIABILITY
3.7 QUANTITATIVE AND QUALITATIVE APPROACHES
3.7.1 CHARACTERISTICS OF QUANTITATIVE AND QUALITATIVE APPROACHES
3.8 THE METHOD OF RESEARCH APPLIED FOR THIS STUDY
3.8.1 LITERATURE STUDY
3.8.2 EMPIRICAL STUDY
3.9 QUESTIONNAIRE COVERING LETTER
3.10 RESPONSE RATE
3.11 CONCLUSION

RESULTS: PRESENTATION AND DISCUSSIONS
4.1 INTRODUCTION
4.2 RESOLUTION OF THE SUB-PROBLEMS
4.2.1 SUB-PROBLEM 1
4.2.2 SUB PROBLEM 2
4.3 ANALYSIS AND INTERPRETATION OF RESULTS OF EMPIRICAL STUDY
### LIST OF TABLES

| Table 2.1 | Problems in traditional companies | 19 |
| Table 2.2 | Problems due to lack of shop floor management | 20 |
| Table 2.3 | Glass wall compared to brick wall management | 25 |
| Table 2.4 | Identifying problems | 38 |
| Table 2.5 | Checklist to identify problems | 41 |
| Table 2.6 | Problem solving approaches | 42 |
| Table 2.7 | Examples of suggestion programmes | 44 |
| Table 4.1 | Summary of audit results | 61 |
| Table 4.2 | Review of SA Canopy audit results | 61 |
| Table 4.3 | Review of other companies audited | 62 |
| Table 4.4 | Responses to questions in section 1 | 64 |
| Table 4.5 | Responses to questions in section 2 | 66 |
| Table 4.6 | Responses to questions in section 3 | 68 |
| Table 4.7 | Responses to questions in section 4 | 71 |
| Table 4.8 | Responses to questions in section 5 | 73 |
| Table 4.9 | Responses to questions in section 6 | 74 |
CHAPTER ONE
INTRODUCTION, PROBLEM STATEMENT AND RESEARCH METHODOLOGY

1.1 INTRODUCTION

As the world’s business climate changes it is getting more difficult for us to remain competitive. Customers demand changes, technology changes, and competitive forces change. In a word, our business environment has become very turbulent. Even though the challenges we face are enormous, we can still address issues that are within our control from shop floor up. In other words rather than viewing the shop floor from the top down organizations need to address its needs from the shop floor up presenting a new perspective of shop floor and its linkage to the total organization (Suzaki, 1993:XV)

Convis (2004: xii) states that management has no more critical role than to motivate and engage large numbers of people to work together towards a common goal by defining and explaining what the goal is, sharing the path to achieving it, motivating them to take the journey with you and assisting them by removing the obstacles.

The purpose of this thesis is to identify what shop floor management principles and measurements are utilised by manufacturing companies and how these principles and measurements can be implemented at SA Canopy and what the benefits for SA Canopy will be.

This chapter will focus on the presentation of the main problem and the sub-problems to be addressed in this dissertation. Furthermore, the delimitation and significance of the study, and the basic methodology used and its structure will be discussed.
1.2 SA CANOPY

SA canopy was previously privately owned by four shareholders who did not see the need for shop floor management as world class manufacturing principles were not important to the existence of the company. The company ran into financial difficulties and was purchased by Autovest a national organization with various manufacturing concerns who supply directly to Original Equipment Manufacturers (OEMs). Being a major player in the component supply to OEMS like Toyota and Nissan South Africa, Autovest board of director’s vision for SA canopy is to grow the company into the largest and most preferred canopy supplier in Africa.

Achieving the Autovest vision will not be possible if SA Canopy does not revisit the way they manage at plant level.

1.3 MAIN PROBLEM

The following question has been identified as the main problem of this study:

Can Automotive Industry shop floor management systems be applied to the jobbing environment of the canopy manufacturing industry of SA Canopy?

1.4 SUB-PROBLEMS

In order to address the main problem the following sub-problems will be investigated, researched and discussed in the subsequent chapters:

- What shop floor management systems are utilised in the Automotive Industry?

- What shop floor management systems are utilised in best in Class Companies?
• Is there synergy between systems utilised by the automotive Industry and the SA Canopy systems?

• Can the controls in the canopy manufacturing industry be enhanced by adopting the Automotive Industry shop floor management principles?

• What shop floor management principles should be implemented and how can they enhance the performance of SA Canopy?

1.5 DEMARCATION OF THE RESEARCH

The scope of this research focuses on the Automotive Component manufacturers who currently supply OEMS in South Africa and SA canopy.

1.5.1 Geographical demarcation

The companies researched include component manufacturers based in the Nelson Mandela Metro.

1.5.2 Size of the organization

The companies studied employ less than 500 people.

1.5.3 Management level

The study will be limited to operators and shop floor management (team leaders), supervisory and middle management. All other management are excluded. The following people will be included in the study:

• Machine operators
• Team leaders
• Supervisors
• Area Managers
1.6 DEFINITION OF KEY TERMS AND SELECTED CONCEPTS

Certain terms and concepts to be used in this study might not be self-explanatory. These will be discussed individually below:

1.6.1 Shared vision

A shared vision is much more than a list of goals. It is something that inspires people and gets them to pull together for cooperative action. People become energized by what their group is trying to accomplish. They pull together to accomplish something worthwhile. Ideally, people can see a personal role in bringing the vision to life. This is the "shared" aspect of a shared vision. The following cultural qualities are associated with a shared vision at the workplace.

A shared vision exists when people:

- Are inspired by the purpose of the group or organization
- Feel that their values and ideas are incorporated into what the organization is trying to achieve
- Can easily communicate the mission and direction of the organization
- See how their day-to-day activities support the overall goals of the organization.


1.6.2 Ownership by people

Ownership by the people means that people are playing a greater role in the success of the company, and are willing to own decisions and be accountable for their outcome.

1.7 SIGNIFICANCE OF THE RESEARCH

According to Suzaki (2003:262) to be able to manage our company better and make it more competitive, we should develop core values, orientate people and the organization towards customers, upgrade skills, and develop leadership in order to move forward.

SA Canopy has been more and more exposed to an increase in competitors in the canopy market. Economic conditions also necessitate an improvement in the current management processes at SA Canopy. One of these tools which can assist SA Canopy in becoming a more competitive organization is the implementation of an affective shop floor management system.

1.8 RESEARCH DESIGN

This section deals with the methodology that will be followed in this study.

1.8.1 Literature survey

Literature from the Nelson Mandela Metropolitan University library as well as other tertiary institutions was consulted to determine the critical information required for a shop floor management program. The internet medium, magazines, newspapers, handbooks and interviews were used to conduct a search to obtain the relevant information related to shop floor management.

1.8.2 Empirical study

The researcher conducted an empirical study to determine the views of members of the researched companies. The empirical study consists of the following:

1.8.2.1 Survey

A survey will be carried out by means of a questionnaire which will be completed by operators and middle management as well as audits of the component manufacturers in the Metropole which will be used to determine:
The shop floor management tools utilized in the industry;
Benefits from utilizing these tools;
Benefits to individuals on the shop floor from this utilization.

1.8.2.2 The development of a conclusion
The results of the literature study will be integrated with the information extracted from the empirical study and the findings of the interviews in order to develop a shop floor management system for SA Canopy.

1.9 PROPOSED PROGRAM OF STUDY
The research has been planned to include the following chapters:

Chapter 1 The problem statement and definition of key terms
Chapter 2 Literature survey on Shop floor Management Principles
Chapter 3 Design and results of the empirical study
Chapter 4 The integration of the findings of the literature surveys, empirical study and the interviews in order to develop a shop floor management model for SA Canopy
Chapter 5 Conclusion and recommendations

1.9.1 Summary
In Chapter 1, the importance of the study was emphasized. Sub-problems have been identified in order to assist in the resolution of the main problem. Key terms and concepts used in the research have been outlined. Thereafter, an outline of the proposed study program is given which is to be used to resolve the main problem and sub-problems.
In Chapter 2, a literature review of the relevant theory pertaining to this research study will be conducted. The literature review will focus on obtaining the facts relating the main problem and sub-problems in Chapter 1.
CHAPTER TWO

LITERATURE OVERVIEW

2.1 INTRODUCTION

An outline of the research paper was given in Chapter 1. The main problem and sub-problems that need to be solved were also stated.

In this chapter the researcher will review literature available for shop floor management principles and measurements and why shop floor management is critical to an organization. The chapter will start with an introduction and end with a summary.

Suzaki (1993:13) states that the worst kind of waste in a company is the waste of not utilising people’s talent. Even people at the top of the organization should be considered useless if they do not contribute ideas to move their organization forward. In order to address these problems and to reach our vision of excellence we need to be creative in all departments.

In Chapter 2 the author will review the shop floor management system utilised in the automotive industry, canopy industry and the best in class practises. The researcher will also look at key principles and measurements which need to be implemented for an effective shop floor management system. The impact of the lack of shop floor management will also be discussed.

2.2 WHY EXCELLENCE IN SHOP FLOOR MANAGEMENT?

Suzaki (1993:22) states that we need to look at a business with the idea that the shop floor is the most critical point of conducting business. It is where value is added, goods produced and services provided to satisfy our customers. In these companies problems need to be addressed at the source, rather than looking at the company strictly from a financial point of view. Various problems are created by the lack of shop floor management in traditional companies as depicted in Table 2.1 below:

Page 18
<table>
<thead>
<tr>
<th>Key Concerns</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic skill are missing, e.g. reading, maths</td>
<td>Someone else has to do the work and rectify the problem. (This may happen if management does not pay attention to the growth of people and simply treats people as extensions of machines)</td>
</tr>
<tr>
<td>No clear definition of requirements, e.g., work instructions and inspection standards.</td>
<td>Supervisor must be called every time something comes up that is unclear. Time is wasted and often poor decisions are made, creating even more problems</td>
</tr>
<tr>
<td>Lack of discipline to follow standards, e.g., housekeeping, workplace organization, work standards.</td>
<td>Extra work is created e.g. rework, janitorial work, unnecessary fire fighting, problem solving work to identify and rectify situation. Also, the same or similar problems may be repeated over and over again.</td>
</tr>
<tr>
<td>Lack of problem solving skills.</td>
<td>Staff, engineers, or managers need to be involved to solve problems. Peoples’ creative talents are not utilised, overhead cost will be increased, and support staff’s time will be taken away from more important jobs.</td>
</tr>
<tr>
<td>Inflexibility in meeting customer demands</td>
<td>People cannot cope with changing demands. Self-control ability is missing. This may generate waste and more fire fighting, additional people, machines, computers, etc.</td>
</tr>
<tr>
<td>Inability to cope with frequent introduction of new models.</td>
<td>As model changes occur frequently most of the work has to be done by engineers rather than having detailed</td>
</tr>
</tbody>
</table>
Liker (2004:21) argues that the incredible consistency of Toyota's success is a direct result of operational (shop floor) excellence. They have turned operational excellence into a strategic weapon. This operation excellence is based in part on tools and quality improvement methods made famous by Toyota. But tools and techniques are no secret weapon for transforming a business. Toyota’s continued success stems from a deeper business philosophy based on its understanding of people and human motivation. Its success is ultimately built on its ability to cultivate leadership, teams, and culture, to devise strategy, to build supplier relationships, and to maintain a learning organization.

According to Suzaki (1993:24) the impact of the lack of shop floor management on each process across the system seems small, however, when compounded, the total impact can be enormous. Impact of the lack of shop floor management on a company is depicted in Table 2.2 below:

**Table 2.2 Problems due to lack of shop floor management**

<table>
<thead>
<tr>
<th>Quality</th>
<th>We need to add additional resources for inspection so that defects are not shipped to the customer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>Additional resources including not only inspectors, but also managers to put out fires are required.</td>
</tr>
<tr>
<td>Delivery</td>
<td>It takes longer to get things done. Also, shipping dates may be missed, with the risk of adding more inventory.</td>
</tr>
<tr>
<td>Safety</td>
<td>Peoples’ safety and environmental concerns may not be addressed adequately because of the fire fighting nature of the operation.</td>
</tr>
<tr>
<td>Morale</td>
<td>Morale goes down as more fire fighting is necessary.</td>
</tr>
</tbody>
</table>

Source: Suzaki (1993:24)
Suzaki (1993: xv) argues that even though the challenges are enormous, we can still address issues that are within our control and the keys to meeting these challenges are the following:

- Clarity of vision
- Customer orientation
- Involvement of everybody
- Problem solving capability
- Shop floor leadership
- Management support system

Below the researcher will indentify how the six pillars mentioned by Suzaki as the key to shop floor excellence are applied in the automotive industry, best in class companies and at SA Canopy.

2.3 APPLICATION IN THE AUTOMOTIVE INDUSTRY

2.3.1 Vision for shop floor excellence.

Most organizations find themselves in an environment where change is the norm and to cope with that they need to understand the following:

- Their business environment
- Be more alert for forthcoming changes
- Share and utilise information more effectively
- Take initiative to continuously improve poor skills and position.

To do this well they need to be self motivated, self thinking and self controlled (Suzaki,1993:21)

Competitive Dynamics International (2003) states that everybody in a world class company shares the same dream and vision. A shared vision is important in an organization as it allow for teams to work together to reach targets. Goals in the mini business units will be formulated based on the shared vision and overall company goals. The vision is important as it provides focus and energy, it describes the ultimate aim of the company. The vision creates a picture of what you aim to become or achieve.
A vision is much more than a list of goals. It needs to be something that inspires people and gets them to pull together for cooperative action. People become energized by what their group is trying to accomplish. They pull together to accomplish something worthwhile. Ideally, people can see a personal role in bringing the vision to life. The following cultural qualities are associated with a shared vision at the workplace. A shared vision exists when people:

- Are inspired by the purpose of the group or organization
- Feel that their values and ideas are incorporated into what the organization is trying to achieve
- Can easily communicate the mission and direction of the organization
- Recognize that both individual and organizational needs are being addressed
- See how their day-to-day activities support the overall goals of the organization.

(www.healthyworkclimate.com/htm/vision/sharedvisiondef/htm)

2.3.2 Customer oriented organization

The recent trends, both international events and the business environment, indicate a shift in the power base from the traditional one to that based on people taking more ownership. The customer supplier relationship exists in our own organizations as well, whether by the processing of information or materials. Every person in the organization needs to satisfy his or her customer’s needs and to ensure that this is understood it is important that a customer supplier relationship chart is developed for every unit in the organization (Suzaki,1993:63)

According to Suzaki (1993:60) to achieve a customer orientated approach we need to do the following:

- Break down the organizational barriers by practising customer orientation i.e. everyone should focus on customer needs
- We need to address problems at the source.
• We need to utilise customer friendly approaches; for example, customer surveys to identify shortfalls.

2.3.3 Involvement of everyone

In the business world, we know that for a president to run a company successfully, he or she should be able to perform key managerial jobs effectively. The more successful the company is the more confidence investors will have in it. If one think about it the same applies within each company as well and each person in the company can be viewed as president of his or her area of responsibility (Suzaki, 1993:67).

Rubrick and Watson (1998:95) argue that teams provide many benefits to the organization which implements them and to the individuals who work within the team environment. There are three major benefits for individuals. These are that they learn new jobs skills, participate in the decisions affecting their jobs and feel like the valuable member of the company that they always have been. Members of the team learn new job skills which are essential if the team expects to make significant improvements. Members also learn problem solving techniques that help them evaluate the information and data they collect and make informed decisions. A fully trained, self directed work team operates as a self contained business where team members set goals, assign work, track progress, communicate with suppliers and customers and work within their operating budgets.

Benefits to the organization can be categorised in three major areas:

• Increased quality.
• Increased productivity.
• Reduced cost

All of this will lead to impressive improvements in customer satisfaction (Rubrick & Watson, 1998:98)
2.3.4 Establishing mini companies / teams

According to Suzaki (1993:69) eight important steps should be followed when establishing a mini company:

Step 1   Name the mini company
Step 2   Write a mission statement for the mini company
Step 3   Compile a company profile by listing its people and describing its machines and tools etc.
Step 4   Develop a customer-supplier relationship chart and discuss the meaning of the arrows.
Step 5   Clarify the objectives of the mini-company
Step 6   Develop action plans to achieve objectives and execute plans
Step 7   Monitor the progress, and celebrate the accomplishments as appropriate.
Step 8   Repeat the cycle at regular interviews

2.3.5 The role of front line supervisors in the mini-company / teams

Suzaki (1993:71) states that if the front line supervisor acts as the president of the mini company his roles and responsibilities in relation to other groups are summarized below:

- Working with top/ middle management
  - Developing goals and actions to achieve them.
  - Assuring that these goals and actions are in harmony with the direction of the total organization.
  - Execute plans, checking progress and report results with adequate explanation. Periodic summary of progress by means of daily, weekly or monthly report of the mini company.
- Working with operators (team members)
  - Sharing of goals and actions with to achieve goals; utilising operator ideas to accomplish them.
  - Execute plans, attain goals and approaches for achieving goals as a group.
o Provide education and training as well as feedback on how things are going.

- Working with people from downstream processes (customers)
  o Practice the idea of “the next process is your customer”
  o Understand the customer’s requirements clearly.
  o Control processes to ensure satisfaction.

- Working with people from upstream processes (suppliers)
  o Provide feedback as a customer of their service.
  o Obtaining support in accomplishing goals in areas where certain skills are missing.
  o Receive education and training to upgrade the level of shop floor control.

2.3.6 Visual management

According Suzaki (1993:78) even if the ideas of mini-companies are understood, running mini companies in isolation is not good enough. The company needs to find ways to further tie peoples creative resources together. Suzaki believes that the “glass management system” plays an important role as it indicates open communication throughout the company.

In order to clarify Suzaki (1993:80) compared glass wall management to the traditional brick wall management style (see Table 2.3).

Table 2.3 Glass wall compared to brick wall management

<table>
<thead>
<tr>
<th>Section</th>
<th>Brick Wall Management</th>
<th>Glass Wall Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management</td>
<td>• Work hard to manage</td>
<td>• Work hard to lead, guide and coordinate</td>
</tr>
<tr>
<td></td>
<td>• Try to outsmart competitors by ability at the top.</td>
<td>• Share destiny with suppliers and people.</td>
</tr>
<tr>
<td></td>
<td>• Results orientated</td>
<td>• Try to strengthen company by using creativity of everybody in the company</td>
</tr>
<tr>
<td></td>
<td>• Short-term orientated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Use people as extensions of machines</td>
<td></td>
</tr>
<tr>
<td>People at shop floor level</td>
<td>Middle management / staff</td>
<td>Use of management</td>
</tr>
<tr>
<td>----------------------------</td>
<td>----------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>- Not asked to use brains</td>
<td>- Specialise in certain field, tend to have narrow view.</td>
<td></td>
</tr>
<tr>
<td>- Not encouraged to upgrade skills</td>
<td>- Do not share knowledge</td>
<td></td>
</tr>
<tr>
<td>- No ownership of what they do</td>
<td>- Do not help others</td>
<td></td>
</tr>
<tr>
<td>- Do not control their destiny's</td>
<td>- Direct people to get things done</td>
<td></td>
</tr>
<tr>
<td>- Creativity is hidden</td>
<td>- Enjoy solving problems without interacting with other people.</td>
<td></td>
</tr>
<tr>
<td>- Small contribution to the success of the company</td>
<td>- Protect current job from others</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Most techniques, such as just-in-time or total</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Encouraged to use brains</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Techniques like just-in-time and quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Experience in various fields, tend to have broader view</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Share knowledge, experience and ideas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Help others</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lead, guide and empower people to get things done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enjoy solving problems through interaction with others</td>
</tr>
</tbody>
</table>

- Long term orientated
- View people as sources of creativity, sharing burden in hard times.
Flinchbaugh (2006) states that visual management is the application of any visual aid or device that promotes safer, more efficient, and less wasteful processes. The goal in using visual management is to create "status at a glance". This means an operating environment where normal vs. abnormal operating conditions can be detected easily and rapidly.

Visual management tools are used to:

- Provide status at a glance enabling quick and simple detection of abnormal operating conditions
- Provide visual aids to help employees complete tasks more quickly and in a more standardized approach

Visual management creates a standardized work environment by providing instructions, directions, reminders, etc. on how the work is to be done. There are limitless possibilities in applying visual management. In fact, most companies probably have some visual management devices already in place, from signs, to painted aisles, to dial indicators on equipment. These basic applications of visual management exist in most operating or administrative environments. The key is to find creative ways to apply visual management to
reduce waste in activities, connections, and process flows. Some common visual management techniques include:

- Colour coding
- Pictures/Graphics
- Kanban cards
- Coloured lines
- Signage
- Labelling
- Control boards
- Area information boards
- Checklists

Like error-proofing, visual management can be applied in so many areas that the use of the tool is only limited by the creativity of the employees. From the office to the factory floor visual management should be used when problem solving, conducting waste walks, performing 5S audits, or generating improvements in Kaizen. To stretch your thinking on how to apply visual management, think about applications at airports, stores, and libraries. Each of these environments relies on excellent visual management techniques.

Visual management techniques can be used in a variety of ways with a limitless number of opportunities creating a significant variation in the actual application. Some synonyms for visual management include visual factory and visual workplace.

Good visual management techniques create a structured work environment where normal operating conditions have been predefined and abnormal conditions can be quickly diagnosed. Put another way, visual management makes it very clear whether an activity produces the results that were intended and conforms to the standards that have been set. Visual management also cuts waste of correction as problems are prevented or quickly detected.

(www.manufacturing.net/article.aspx?id=6556/htm)
2.3.7 Continuous improvement process

Our business world is similar to the natural world in that survival of the fittest is the name of the game. When one studies the evolutionary process of different species, we find that certain species have adapted to environmental changes better than others. In the business world too, a company needs to adapt to changes in order to survive (Suzaki, 1993:88).

2.3.8 Key points for organizational innovation

Reflecting on the point above, for an organization to be innovative, the following key points need to be considered:

- Top management should clear their own minds in order to identify ways to explore the potential of people.
- There must be a change from power-orientated thinking to people and customer orientated thinking.
- The power base must shift from top of the organization to a lower level (mini company concept), so that each decision can be made at the lowest possible level.
- Top management must coordinate these activities and provide the necessary support.
- Each person in the organization must be considered a president of a mini company.

If top management fails to do this, the problems which develop inside the organization may be compared to cancer. In other words the balance in the body is upset and one cannot detect signs of disease therefore even nature’s own defence system may not be enough to save it (Suzaki, 1993:89).

2.3.9 Shop floor excellence

Below the author will identify principles and practices which reflect shop floor excellence in automotive plants.
2.3.9.1 Quality, cost, delivery, safety and morale scoreboards

Whether for a whole company, a division, or a unit of the company we need an appropriate scoreboard to track progress (Suzaki, 1993:94)

Rubrich and Watson (2000:177) state that communication is the key to making teams effective and successful. Visual communication provides fast, two way communication between teams, shifts and management. Visuals provide information that is used to provide information that can be used to compare the goals of the team and the company so that the performance can be measured.

Charles Standard cites in the article “Visual Management: More Than Just A Pretty Plant” that a QCDSM scoreboard generates and maintains interest. It provides unambiguous feedback about performance. It presents the same information to everyone, whether owner, manager, player, or spectator. Most importantly, it keeps us focused on the measures that are important and lets us know what must be done to win the game.

By analogy, true visual management shares real-time information about the status of the factory:

- What are our goals?
- What are our key measures?
- How is the factory performing in relation to those goals?
- What is preventing us from reaching our goals?
- Most importantly, how does my individual effort contribute toward success?

Visual management provides a clear and common understanding of goals and measures. It allows people to align their actions and decisions with the overall strategic direction of the company. It is also an open window to factory performance, and it provides the same unbiased information to everyone, whether owner, manager, operator or visitor.
There is irrefutable evidence that "shared vision" is critical to the success of today's factory. Visual management communicates that shared vision along with an understanding of how each individual contributes toward that success of achieving this vision.

(www.sae.org/manufacturing/lean/column/leanoct00.htm)

2.3.9.2 Suggestion programs

The number of suggestions indicate the morale of people in general, and are a measure of total creativity of the organization. High numbers of suggestions indicate good quality, cost, delivery and safety performance.

Rubrich and Watson (2000:392) state that suggestion systems can be powerful tools to unleash the ideas of the entire team by improving communication between management and operators.

The Japanese have been highly successful using suggestions while the average American experience has been substantially less. The two reasons for the success gap are empowerment and manager’s attitude towards the implementation of suggestions. In Japanese organizations suggestion schemes are an integral part of the management system. The number of suggestions received and implemented are important measures of a supervisors performance appraisal.

Suggestion systems give employees a voice and a role in determining company policies and operating procedures. Employee suggestions can help increase efficiency, eliminate waste, improve safety, and improve the quality of a company’s products and services. The company benefits not only in terms of cost savings realized as a result of employee suggestions, but also in terms of better employee morale. In many cases suggestion systems can help develop teamwork among employees. While the goal of a suggestion system is for cost savings to exceed expenses associated with the program, there are also intangible benefits to be realized from suggestion systems.
2.3.9.3 Housekeeping and organization

According Suzaki (2000:89) a disorganized workplace implies a lack of attention to the most basic point of business.

Ravikumar (2009) states that 5S is a system to reduce waste and optimize productivity through maintaining an orderly workplace to achieve more consistent operational results. It derives from the belief that, in the daily work of a company, routines that maintain organization and orderliness are essential to a smooth and efficient flow of activities. Implementation of this method “cleans up” and organizes the workplace basically in its existing configuration, and it is typically the starting point for shop floor transformation. The 5S pillars, Sort (Seiri), Set in Order (Seiton), Shine (Seiso), Standardize (Seiketsu), and Sustain (Shitsuke), provide a methodology for organizing, cleaning, developing, and sustaining a productive work environment. 5S encourages workers to improve the physical setting of their work and teaches them to reduce waste, unplanned downtime, and in-process inventory. A typical 5S implementation would result in significant reductions in the floor space needed for existing operations. It also would result in the organization of tools and materials into labeled and color coded storage locations, as well as “kits” that contain just what is needed to perform a task. 5S provides the foundation on which other lean methods, such as TPM, cellular manufacturing, just-in-time production, and six sigma, can be introduced effectively.

2.3.9.4 Visual controls

Suzaki (1993:94) states that people’s growth within a company relates to the level of stimulation they get from different means. Visual displays of a colleague’s achievements or his name in a company newsletter may influence peoples’ attitude and behavior about their own growth in the organization.
According to Liker (2004:152) visual control is any communication device used in the work environment that tells us at a glance how work should be done and whether it is deviating from the standard. Visual controls might show where items belong, how many items belong there, what the standard procedure is for doing something, the status of work in progress and many other types of information critical to the flow of activities.

2.3.9.5 Shop floor meetings

Daily, weekly or monthly meetings will provide a setting to establish critical interface between management and shop floor people. Many managers see meetings as a waste of time, but meetings are a means to involve people and share ideas about continuous improvement (Suzaki, 1993:95).

2.3.9.6 Visibility of top management on the shop floor

Top management presents on the shop floor indicates that the shop floor is the engine of the company. When people are able to share some of their recent improvements with top management, it indicates that there is a very small gap between management and the shop floor. It is also important for management to be present on the shop floor to get a better understanding of what is happening on the shop floor (Suzaki, 1993:95).

2.3.9.7 Education and training

According to Suzaki (1993:95) progressive companies have organised education and training programs that are closely tied to employees growth.

According to Shultz (2003: 31) diversity can only be appreciated if:

- Everybody is given the opportunity to develop their skills and reach their full potential.
- People are empowered with knowledge
- People are given the opportunity to utilise their knowledge and skills

To achieve this requires training and development, multiskilling, empowerment and mentoring.
2.3.9.8 Standard procedures

In progressive organizations the level of shop floor management is also measured by the effective use of standardised procedures. Standardised procedures are appropriate not only for specific jobs but also for housekeeping, organization, visual aids and meetings on the shop floor (Suzaki, 1993:95).

Standard operating procedures (SOPs) are the lifeblood of any successful company and should be developed for every process in your business. An organization should have procedures for everything from hiring new employees to equipment maintenance, to how to properly install pavers. Without a standardised procedure, an employee would not know if he was doing something right or wrong? If managers or supervisors, are the only ones that know how to get things done, one would never be able to grow the company. (www.igin.com/article-870-the-importance-of-sops.html)

Standard operating procedures are best practices; what you and your team have determined to be the best possible way to do a particular operation in your business. SOPs are what you believe to be the most efficient, most effective way to execute that operation. SOPs help a business have predictable end results, something that can be repeated again and again. (www.sopmd.com/blog/the-importance-of-standard-operating-procedures)

2.4 SHOP FLOOR MANAGEMENT PRINCIPLES APPLIED BY WORLD CLASS COMPANIES

Below the researcher will identify the management principles applied by world class companies not necessarily the automotive industry.

Rubrick and Watson (2000:22) state that to become best in class requires every department in a company to do things differently. Only then can one hope to get different results. To achieve this an organization need to have the following in place:

- A well communicated vision, direction, and strategy.
- An empowered work force and total employee involvement
2.4.1 Clear Vision

Collins (1996) states that companies which enjoy enduring success have core values and a core purpose that remain fixed, while their business strategies and practices endlessly adapt to a changing world. Examples include Hewlett-Packard, 3M, Johnson & Johnson, Proctor & Gamble, Merck, Sony, Motorola, and Nordstrom.

Truly great companies understand the difference between what should never change and what should be open to change, between what is genuinely sacred and what is not. This rare ability to manage continuity and change is closely linked to the ability to develop a vision.


2.4.2 Total employee involvement

For senior managers to sit in their offices and assume that they have all the knowledge and experience needed to make critical risk decisions are a prescription for failure. To make the best decisions with the most knowledge, managers have to use the combined intelligence of the entire workforce. But just saying this does not make it happen; to capitalize on the human resource and experience requires empowering the workforce. Participation in the strategic planning process ensures that all employees understand the direction in which the organization is moving and why. Everyone in the organization needs to understand his or her role in achieving the business goals. When managed correctly and reinforced regularly, people will actively participate in the execution of the plan.

Most companies that have made effective use of their people have done so using teams. Organizing teams of people into functional or strategic groups is a good start. All people in the teams need training in specific areas to help ensure that the team process will work. These areas include; how to conduct and participate in meetings, the fundamentals of project management, problem solving methodology, and conflict resolution.
As teams take on more responsibilities and assume ownership of their areas, the demand for other support declines. This becomes an opportunity for reducing the expense of indirect headcount or redeploying these people into tasks that add greater value.

Senior management needs to give teams the responsibility and authority to run their areas in both a tactical and a strategic manner. Senior management's role is to understand what the obstacles are and to remove them. Anything less will not build the foundation needed in the organization to deal with change and risk taking.


2.5 UPGRADE SKILLS TO IMPROVE SELF MANAGEMENT

According to Suzaki(1993:116) shop floor management only works in an organization where people skills can be upgraded. In this section the researcher will identify ways to upgrade people skills and how to develop a positive attitude towards continuous improvement.

2.5.1 Matching skills with the organizational needs

Doing your work effectively requires many different skills. Some are improvement-related and some are job related and others are interpersonal or managerial skills. For the organization to be more effective it needs to identify its needs and then put actions in place. We need to educate ourselves and upgrade our skills so that we can be in charge of our destiny (Suzaki,1993:116).

2.5.1.1 Skills required for self management

In order to upgrade one’s self management skills and be capable of addressing problems at the source we need several different types of skills in the organization:

- Skills related to maintenance:
These are the skills needed to maintain standards, follow procedures correctly, and to be able complete the job on time without accidents or defects.

- Skills related to improvement:
  These are the skills needed to identify problems and follow through in order to solve them, either individually or with a group of people.

- Skills related to individuals:
  These are analytical and workmanship skills for individuals, propelling them towards self improvement even in a difficult situation.

- Skills related to teamwork:
  These are the skills needed to become effective team members, to contribute ideas, and to work towards accomplishing the team’s mission.

- Skills related to specific tasks:
  These are the specific technical skills required to get the job done.

- Skills related to management:
  These are the managerial skills to coordinate, communicate, and cooperate with others to get the job done

### 2.5.2 The role of managers and support people

The important role of managers and support people is to upgrade the skills of their people. Unfortunately many of us do not practise or do not know how to practise this well. Some of the problems encountered by managers and staff are listed below (Suzaki, 1993:124):

- Management does not realize the importance of upgrading skills.
- Managers are insecure about teaching new skills.
- Managers assume that many people are not capable of learning.
- Managers focus on upgrading their own skills first.
- Managers have not gained the skills required to teach or lead people.

As a result of the above, managers do not take responsibility and do not allocate sufficient time for education, which leaves people behind. However, if managers understand the need to accomplish their vision they will subscribe to the ideas below (Suzaki, 1993:125):
- Think of people in the organization as customers whose development needs are to be satisfied.
- Develop faith that people can do a better job if they are given proper opportunities.
- Be open and friendly to people, even listen to their personal problems.
- Find good qualities in people, do not dwell on their weaknesses.
- Provide instructions with empathy, do not simply tell people what to do.
- When subordinates make mistakes, correct them with reason.

2.6 PROBLEM SOLVING SKILLS

According to Suzaki (1993:144) without a desire for self-improvement, there is no self management. On the shop floor, problems are everywhere, ranging from housekeeping to machine maintenance, from improving quality to increasing productivity, from developing effective communication to fostering teamwork and to accomplishing the mission. In effect these are problems with quality, cost, delivery, safety, and morale that we have to solve in order to accomplish our mission and satisfy our customers with minimum waste. Therefore it is important that we are equipped with problem solving skills and that we practise these skill in whatever situation we in and not wait for someone else to do the job for us.

Suzaki (1993:152) recommends the following when identifying problems (see Table 2.4) below:

Table 2.4 Identifying problems

<table>
<thead>
<tr>
<th>Consciousness</th>
<th>Maintain awareness that problems exist everywhere.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-esteem</td>
<td>Develop self esteem as opposed to only following someone else’s instructions.</td>
</tr>
<tr>
<td></td>
<td>Think of improving your workplace by yourself.</td>
</tr>
<tr>
<td>Challenging spirit</td>
<td>Always assume that there must be a better way.</td>
</tr>
<tr>
<td></td>
<td>Don’t think something is impossible</td>
</tr>
<tr>
<td>Common sense</td>
<td>If we feel overburdened, wasteful, or inconsistent in QCSDM- think of ways to fix it.</td>
</tr>
<tr>
<td></td>
<td>Feel right about what’s happening? If not ask why.</td>
</tr>
</tbody>
</table>
Customer Orientation
Ask customers about their problems, listen to them attentively.

Shop Floor Orientation
Search for problems on the shop floor.
Ask people about their concerns.
Use tools to expose problems.

Objectivity
Observe the situation objectively, without prejudice.
Don’t jump to conclusions.

Analysis
Ask “why” repeatedly when troubled to reach the root cause of the problem.
Use measurement systems and statistical methods.

Teamwork
Utilise other people’s skills, knowledge and experience
“None of us is as smart as all of us”

Source: Suzaki (1993:152)

2.7 PROBLEM SOLVING TOOLS USED IN THE AUTOMOTIVE INDUSTRY

Even with positive attitude and challenging spirit about solving problems, without tools and organised steps to do so we may end up spinning our wheels. Problem solving tools that one may use can range from common sense and or inherent creativity to more advance tools (Suzaki, 1993:155).

Identifying a very clearly defined and specific problem is the first critical step to successfully implementing the problem solving process. The strategy of improving the quality of services involves solving problems in order of priority. Why is it important to prioritize problems?

- Resources and time are limited. You can’t solve all the problems at the same time, so your efforts should initially focus on the most important problem.

- To gain experience and acquire expertise with the problem solving process, the first problem you work on should be one that is easily studied and resolved. Choose a problem with plenty of data easily available.

(http://erc.msh.org/quality/identify.cfm)

Below the author will identify some basic tools to enforce problem solving.
2.7.1 Agreement on targets and discipline to follow up

According Suzaki (1993:165) goals without specific target dates are meaningless. If an organization wants to move forward the organization needs to set deadlines for accomplishing certain tasks. A method of achieving these goals timorously is to follow up by using the PDCA cycle.

2.7.2 Discipline in the workplace

As the workplace is organised many problems for people to work on will surface. Pictures of examples of good and bad organization with comments can be displayed (Suzaki:1993).

2.7.3 Cross training / job rotation

Cross training allows for the expansion of people’s skills and at the same time allows them to look at their workplace with a fresh perspective. Employment date and the qualifications for certain jobs should show each individual's growth (Suzaki:1993).

2.7.4 Checklists

Routine use of appropriate checklists will help to identify problems. Checklists may be displayed indicating the levels of attendance, compliance to work instructions, quality standards, housekeeping and organization (Suzaki:1993).

2.7.5 Mini company (QCSDM) scoreboard

“What gets measured gets done”. The scoreboard will indicate targets and how the company is performing against those targets. Under achievements should not be used to punish people but to identify problems which prevent the company from achieving its targets (Suzaki:1993).
2.7.6 Standard operating procedures at each work station

Discrepancies between actual work and work procedures will identify a need for training or improvement of the work procedures (Suzaki:1993).

2.7.7 Ten worst suppliers

Display the names of your top ten suppliers both internal and external. This will expose problems which can then be rectified (Suzaki:1993).

2.7.8 Award programs

Award programs motivate people to improve in areas such as housekeeping, safety and performance. The process which follows the introduction of the above mentioned tools is very important. If these tools are introduced haphazardly, they may hurt the organization and demoralise people and management may lose credibility. Coordination of implementation, support and feedback from management and education therefore becomes very important (Suzaki, 1993:173).

In addition to the above a checklist can be developed to identify problems (see Table 2.5) below:

Table 2.5 Checklist to identify problems.

<table>
<thead>
<tr>
<th>Improvement of methods of operation and machine tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Are materials, tools, products placed in an appropriate fashion?</td>
</tr>
<tr>
<td>• Can processing methods be improved so that the operation becomes easier?</td>
</tr>
<tr>
<td>• Can plant layout and transportation devices be improved so that the operation can be made easier or more efficient?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Saving of materials and consumables items</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Are consumables used in the most effective fashion?</td>
</tr>
<tr>
<td>• Are there ways to prevent air, water and lubricants from leaking?</td>
</tr>
<tr>
<td>• Can we improve materials, processing methods or tools and jigs so that materials yield can be improved?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Improvement of efficiency of admin work, establishment of control</th>
</tr>
</thead>
</table>
methods?
• Is redundant work done at multiple locations?
• Can any work be eliminated?
• Are there ways to improve paper processing work?
• Are there ways to proceduralise work methods?

**Improvement of work environment and safety hazards**
• Are lighting, air and temperature controlled properly?
• Is dust removed efficiently?
• Is safety equipment installed and functional?

**Improvement of performance and improvement of accuracy**
• Can design and processing methods be changed to improve performance?
• Are there ways to achieve better consistency in production?

Source: Suzaki (1993:166)

### 2.8 APPROACHES FOR PROBLEMS SOLVING ACTIVITIES USED IN THE AUTOMOTIVE INDUSTRY

Suzaki (1993:178) states that if a mini company wishes to perform well, it needs to develop a range of approaches (activities) for people to practice their problem solving skills fully in order to address the needs of the organization. Table 2.6 below summarizes a range of typical approaches to problem solving which are practised by progressive companies.

**Table 2.6 Problem solving approaches**

<table>
<thead>
<tr>
<th>Approach</th>
<th>Participant and Activities</th>
<th>Measure of effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggestion program</td>
<td>Individuals or groups; Focus first on the involvement of people and then on the effectiveness of the program</td>
<td>Number of suggestion as key index; then content of suggestion.</td>
</tr>
<tr>
<td>Self managing team, quality circle, team improvement</td>
<td>Groups of people mainly from the same work area; Support and guidance may be given by management</td>
<td>Number of completed projects; content of improvements.</td>
</tr>
</tbody>
</table>
activities and support staff. Focus on self management.

Management driven task force
Group of people; Members may be determined according to the problem. Often a multifunctional approach is used.

Strategic planning, policy management
Management and staff, addressing the strategic direction of the company.

Cross functional management
Cross-functional teams, addressing the key cross functional issues such as quality cost delivery

Timing and results
Clarity on overall approaches and results accomplished.
Identify key problems and monitor progress.

Source: Suzaki (1993:179)

2.8.1 Steps for effective problem solving

If an organization wants to practice problem solving activities company wide, understanding people's thinking process becomes a key prerequisite for managers. If managers understand how people behave better at work we may eliminate confusion by setting criteria that everyone understands. Therefore we need to take certain common steps when making improvements and solving problems and these basic steps are as follows (Suzaki,1993:180):

- Recognise the problem.
- Idea generation
- Experiment with idea
- Check effectiveness
- More Idea generation
- Experiment with idea
- Check effectiveness
- When effective, standardise
2.9 SUGGESTION PROGRAMS

According Suzaki (1993:184) one of the most fundamental approaches for problem solving is the suggestion program. In order to gain everyone’s involvement monetary incentives should be limited. Activities which stimulate ideas are sharing examples in meetings, or posting pictures on display boards. Awarding special points for suggestions relating to a focussed subject such as housekeeping for the month may accentuate the program. See Table 2.7 below for examples of suggestion programs.

Table 2.7 Examples of suggestion programs

<table>
<thead>
<tr>
<th>Type</th>
<th>Description of Program</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal</td>
<td>No awards are given. Suggestion are considered as part of the job</td>
<td>Consciousness-driven, easy to administer</td>
</tr>
<tr>
<td>Doughnut / Lunch</td>
<td>Free doughnut or lunch is given to the team when a certain number of suggestions are made.</td>
<td>Emphasis is on teamwork</td>
</tr>
<tr>
<td>Potluck</td>
<td>Everybody gets a ticket for each suggestion made and entered in a draw every month to win an award.</td>
<td>Emphasis on having fun</td>
</tr>
<tr>
<td>Formal</td>
<td>Awards vary from entry award to profit sharing contribution. Jackets, caps may also be given.</td>
<td>More formal type program</td>
</tr>
<tr>
<td>After-the-fact</td>
<td>Only ideas that have been implemented qualify. Especially suited for those who have experience.</td>
<td>Easy to administer; emphasis on people’s ownership to implement ideas.</td>
</tr>
</tbody>
</table>

Source: Suzaki (1993:179)
2.10 MANAGING SHOP FLOOR IMPROVEMENT ACTIVITIES USED IN THE AUTOMOTIVE INDUSTRY

2.10.1 Goal setting

Every individual in an organization should have goals to achieve, whether they are individual or team goals. If people clearly understand the rules of the game the organization plays the better are the chances of performing better and enjoying the process. Traditionally goals were set at top management level without involving people lower down. Often these goals were not explained to the people, even worse, the goals as people understood them were conflicting. However, if one can develop a broader understanding of the business and define appropriate measures for peoples' performance we can link the individual's goals with the goals of the organizations. One of the areas the organization should focus on is front line supervision. The more supervision develops their skills to handle multiple functions and goals, the better the organization will function. In order to incorporate such thinking in your workplace different goals need to be set at the different stages of progress in shop floor management and attention should be paid to a number of key points as listed below (Suzaki, 1993:231):

- Goals should offer a challenge to people, rather than an estimate of what may happen.
- Goals need to be persuasive for people to buy in and have ownership.
- Goals should be measurable i.e. what gets measured gets done.
- Goals may be set by comparing performance (benchmarking)
- Goals may be according to necessities of the business.
- Goals may be suggested by people and then discussed with their managers.
- Goals must be slightly above the ability of the people to make them more challenging.
- Goals should reflect the analysis of the past problems.

According to Suzaki (1993:230) supervisor goals differ at the different stages of shop floor management implementation as follows:
Level 1: Schedule compliance is the major goal. Quality is checked by another department. Cost reduction is a goal but handled by manufacturing engineers. Minimum planning for achieving goals is done.

Level 2: Quality and Delivery (QD), or Cost and Delivery (CD) are considered major goals. Other goals may exist, but main effort is spent on managing individuals as opposed to working on processes. Planning to achieve goals is done on ad hoc basis.

Level 3: Quality, cost and delivery (QCD) are major goal. Morale (M) and safety (S) are also considered important but no goals are set. Communication with employees is becoming more frequent, discussion with employees becomes more two-way. Some problem solving tools are used in problem solving.

Level 4: QCDSM are major goals. Supervisors realise the importance of peoples involvement. As people take more responsibility, supervisors can spend more time on important, long term or chronic problems. Also goals are developed, approaches for achieving goals are evaluated, reflecting people’s problem solving abilities. More sharing of progress with people becomes apparent.

Level 5: There are multiple goals with different priorities. Design changes and new product development supervisor’s goals parallel more closely to the company’s overall goals. At this stage people will able to describe the concerns of their organization, how those may influence the performance of the company and how they are addressing the problems.

2.10.2 Management cycle

As goals are set, the organization needs to achieve them. Here we can use the plan-do-check-act (PDCA) as the basic management discipline. This is similar to sailing a boat and reaching a destination by monitoring progress. For example we may set a course by considering wind direction, weather forecast and the like (plan). Then we sail according to plan by aiming at a certain point on the compass (do). Later we review our progress by comparing our location
to the original plan (check). By figuring out the reason for deviating (act), we can recalculate the course (plan) and direct the course of our ship (do), and repeat the process until we reach our destination (Suzaki, 1993:235).

### 2.11 TYING SHOP FLOOR MANAGEMENT TO THE TOTAL BUSINESS

In order to thrive in today’s business world we need to be able to control the process closest to where the action is, the shop floor. World class company’s strategy and deployment process should reflect such thinking. In traditional organizations a top driven policy and strategic direction were considered keys to success. Direction from the top may still be important but a better use of all creative resources within the company may shift power structure to differ to that of a traditional company. In other words instead of a belief that strategy should be developed from the top, our organization may need to be flexible enough to coordinate top-down, bottom-up, as well as cross functional management processes to search for the best use of people talent (Suzaki, 1993:263)

In order to address the mission of the company and the involvement of its people in the policy and strategic development process, we need to develop a comprehensive process that everybody understands. The step of policy development may follow the steps below:

- Review the performance of the past period by department. Any major problems remaining are continued to the current period.
- Accommodating the companies policy the department managers must develop departmental policy. The policy must have two-part objectives and plans of action.
- Departmental objectives for the period must be developed. If considered critical for the company, some objectives and approaches for achieving them may be suggested from corporate level.
- Plans of action to achieve objectives are developed for the department.
- The unit manager reviews performance from prior period and develop action plans to improve.
- Accommodating the department’s policy, the unit manager develops the unit policy. Again, the policy has two-part objectives and plans of action.
• Objectives for the period are developed if considered for the company and/or department, some objectives and approaches to achieving them may suggested from corporate or department levels.
• Plans of action are developed to achieve objectives for the unit.
(Suzaki,1993:285)

2.12 CONCLUSION

The literature study supports the fact that shop floor management is an important management tool for organization who strive for excellence. If a company wants to achieve excellence they need to go back to the shop floor where reality is. Literature support the fact that shop floor principles such as having a vision, understanding your customer’s expectations, excellence in problem solving and good management and leadership skills support each other in the quest for excellence. The principles cannot be practised in isolation.

In chapter three the research design and methodology will be discussed.
CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

In Chapter 2 the author discussed guidelines for an effective shop floor management system as well as the application of shop floor management principles. The literature study was used to establish the answer to the first sub problem:

- What shop floor management systems are utilised in the Automotive manufacturing industry?

The purpose of this chapter is to describe the research methodology applied by the researcher to solve the remaining sup-problems. The development and structure of the questionnaire, the design of the of the questionnaire and the administration will be discussed. The responses of the respondents will also be discussed, followed by an analysis of the biographical details of the respondents.

3.2 RESEARCH DESIGN

Jankowitz (1995:173) defines research methodology as the analysis of data, the rationale for particular methods used in a given study. Research according to Leedy and Ormrod (2003:4) refers to the systematic process of collecting and analysing information (data) in order to increase our understanding of the phenomenon about which we are concerned or interested. Zikmund (1994:43) defines a research design as the master plan that specifies the methods and procedures used in collecting and analysing information. With this in mind, the research design for this study was broken down into the main problem, with three sub-problems.

‘Can Automotive Industry shop floor management systems be applied to a jobbing environment of canopy manufacturing industry of SA Canopy?’

Following from the main problem, three sub-problems were identified to assist with the solution of the main problem; namely,
• What shop floor management system is utilised in the automotive industry?
• Can the controls in the canopy manufacturing industry be enhanced by adopting the automotive industry shop floor management principles?
• What shop floor management principles should be implemented and how can they enhance the performance of SA Canopy.

The procedure used to solve the main problem and the sub-problems was follows:
• In Chapter 2 a literature survey was conducted providing guidelines and principles used when establishing an effective shop floor management system in an organization.
• In order resolve sub-problems two and three a survey based on the key elements of shop floor management identified in the sub-problems was developed and circulated to middle management and shop floor personnel of various companies and SA Canopy.

3.3 CONDUCTING THE EMPHERICAL STUDY

The empirical study was conducted by distributing a questionnaire and conducting audits. The results of the questionnaire were statistically analysed. Sampling procedures and the research response are discussed in detail below.

3.4 SAMPLING METHODS AND SIZE

Before the study could be initiated, it was necessary for the researcher to decide whether to study the company in question in its entirety, or to do a sample of the workforce.

Wegner (2001:169) argues that is not always practical to gather data on every possible observation in a population. If this is the case, then a subset of all observations, called a sample, is usually gathered on the random variable. Leedy and Omrod (2001:211) state that “the sample should be carefully chosen so that, the researcher is able to see all the characteristics of the total
population in the same relationship that they would be seen were the researcher, in fact to inspect the total population”.

According to Wegner (2001:170) there are two basic methods of sampling:

- Non-probability sampling methods, and
- Probability sampling methods.

3.4.1 Non-probability Sampling

Wegner (2001:170) defines the non-probability sampling methods as any sampling method in which the observations are not selected randomly. There are three types of non probability sampling procedures:

- Convenience sampling – a sample drawn to suit the convenience of the researcher;
- Judgemental sampling – judgement is used by the researcher to select the best sampling units to include in the sample; and
- Quota sampling – the population is divided into segments and a quota of observations is collected from each segment.

Wegner (2001:171) points out that the disadvantage of the non-probability sampling methods is the unrepresentative nature of the sample with respect to the population from which it is drawn.

3.4.2 Probability sampling

Wegner (2001:171) states that probability sampling includes all selection methods where the observations to be included in a sample have been selected on a purely random basis from the population. The following are probability techniques:

- Simple random sampling – each observation in the entire population has an equal chance of being selected;
- Systematic random sampling – some randomness is sacrificed: sampling begins by randomly selecting the first observation and thereafter
subsequent observations are selected at a uniform interval relative to the first observation

- Stratified random sampling – if the population is regarded as being heterogeneous with respect to the random variable under study, the population can be divided into the segment or strata where sampling units in each stratum are relatively homogenous; and
- Cluster random sampling – the population is divided into clusters, where each cluster is similar in profile, to every other cluster.

It is clear that for the purpose of this research, the most useful sampling method is that of random sampling, which is part of the probability group of sampling techniques.

3.5 DATA TYPES

According to Wegner (2001:7) data quality is influenced by three factors: the type, source and methods of data collection.

Data types are determined by the nature of the random variable which the data represents which can be:

- Qualitative random variables which yield categorical (non-numerical) responses; and
- Quantitative random variables which yield numeric responses.

3.5.1 Data types 1

- Nominal-scaled data is associated mainly with qualitative random variables where with data assigned to a number of categories of equal importance.
- Ordinal-scale data associated with qualitative random variables is assigned to only one number of coded categories, but there is now ranking implied between the categories in terms of being better, older, longer, taller, stronger, etc.
3.5.2 Data types 2

- Discrete data is a random variable whose observation can take on only specific values, usually only integer values are referred to as a discrete random variable.
- Continuous data is a random variable whose observations can take in any value in an interval and is said to generate continuous data.

It is clear that for the purpose of this research, the most useful data type that will be used is that of interval-scaled data.

3.6 THE QUESTIONNAIRE

The questionnaire is the data collection instrument used to gather data in all interview situations. According to Wegner (2001:17) the design of a questionnaire is critical to ensure that the correct research questions are addressed and that accurate data for statistical analysis is collected.

3.6.1 The design

According to Wegner (2001:17 a questionnaire should consist of three sections:

- The administrative section is used to record the identity of the respondent and the interviewer by name, data, and address, and where the interviews were conducted;
- The demographic or classification section describes the respondent by a number of demographic characteristics which generally include age,
gender, residential location, marital status, language, qualification, etc; and

- The information sought section makes up the major portion of the questionnaire and consists of all questions which will extract data from respondents to address the research objectives.

Leedy and Ormord (2001:202) suggest that the following guidelines be used for developing a questionnaire that encourages people to be cooperative and yield responses which can be used and interpreted:

- Keep it short and as brief as possible;
- Use simple, clear, unambiguous language;
- Check for unwarranted assumptions implicit in your questions;
- Word your questions in ways that do not give clues about preferred or more desirable responses;
- Check for consistency;
- Determine in advance how you will code your responses;
- Keep the respondent’s task simple;
- Provide clear instructions;
- Give rationale for any items where the purpose may be unclear;
- Make the questionnaire attractive and professional looking;
- Conduct a pilot test
- Scrutinise the almost-final product carefully to make sure it addresses your needs

### 3.6.2 Validity and reliability

Leedy and Ormord (2001:98) argue that validity of a measurement instrument is the extent to which the instrument measures what it is supposed to measure. It takes different forms, each of which is important in different situations:

- Face validity is the extent to which, on the surface, an instrument looks like it is measuring a particular characteristic;
- Content validity is the extent to which a measurement instrument is a representative sample of the content area being measured;
- Criterion validity is the extent to which the result of an assessment instrument correlate with another presumably related measure; and
- Constructive validity is the extent to which an instrument measures a characteristic that cannot be directly observed but must instead be inferred from patterns in people behaviour.

Leedy and Ormord (2001:99) explain that reliability of measurement instruments is the extent to which it yields consistent results when the characteristics being measured have not been changed. The following are forms of reliability that are frequently of interest in research studies:

- Interrater reliability is the extent to which two or more individuals evaluating the same product or performance give identical judgments;
- Internal consistency reliability is the extent to which all the items within a single instrument yield similar results;
- Equivalent forms reliability is the extent to which two different versions of the same instruments (e.g. “Form A” and “Form B” of a scholastic aptitude test) yield similar results; and
- Test-retest reliability is the extent to which the same instruments yields the same result on two different occasions.

### 3.7 QUANTITATIVE AND QUALITATIVE APPROACHES

Leedy and Ormord (2001:95) explain that quantitative research is used in general to answer questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena. This approach is called the traditional, experimental, or positivist approach.

In contrast, qualitative research is typically used to answer questions about the complex nature of the phenomena, often with the purpose of describing and understanding the phenomena from the participants point of view. The qualitative approach is also referred to as the interpretative, constructivist, or post positivist approach.
3.7.1 Characteristics of quantitative and qualitative approaches

Leedy and Ormord (2001:95) explain the characteristics as follows:

- **Purpose**: Quantitative approaches seek explanations and predictions that will generalise to persons and places. The intent is to establish, confirm or validate relationships and to develop generalisations that contribute to theory. Qualitative researchers seek a better understanding of complex situations. Their work is often explanatory in nature, and they may use their observations to build theory from the ground up.

- **Process**: Quantitative studies represent the mainstream approach to research, carefully structured guidelines exist for conducting them. Concepts and methods of measurement are defined before the study begins and remain the same throughout. The Qualitative research process is more holistic and emergent with the specific focus, design, measurement instruments (e.g. interviews and interpretations) developing and possibility changing along the way.

- **Data collections**: Quantitative researchers identify one or a few variables that they intend to study and then collect data specifically related to those variables. Specific methods measuring each variable are identified, developed, and standardised with attention to the validity and reliability of the measurement instruments. Qualitative researchers operate under the assumption that reality is not easily divided into discreet measurable variables. Qualitative researchers are often described as being the research instrument because data collection is dependent on their data collection and is dependent on their personnel involvement in the settings.

- **Data analysis**: All research require logical reasoning. Quantitative researchers tend to rely on deductive reasoning, beginning with certain premises (e.g. hypothesis, theories) and then drawing logical conclusions from them. In contrast qualitative researchers make extensive use of inductive reasoning. They make many specific observations and then draw inferences about larger and more general phenomena.
For the purpose of this paper the researcher will utilise the quantitative method as specific audit criteria and questions will be created beforehand to evaluate the selected companies.

3.8 THE METHOD OF RESEARCH APPLIED FOR THIS STUDY

The method applied in this study was conducted in a manner that ensures that the study will satisfactorily answer the primary and secondary objectives. The method followed was the academic study which laid the foundation of the research. Books, the internet and journals were used.

3.8.1 Literature study

A literature study was conducted in chapter two. It revealed the key shop floor management principles, how to apply and the benefits of these principles. Literature also revealed the problems experienced in manufacturing organisations due to a lack of shop floor management.

3.8.2 Empirical study

The empirical study was conducted using questionnaires that were distributed to team members and team leaders or supervisors in the various plants. Audits will be conducted of the plants seek for evidence that the shop floor management principles are applied.

The questionnaires were used to determine if the key shop floor management principles identified in the literature survey benefit the worker at shop floor level.

3.9 QUESTIONNAIRE COVERING LETTER

In the covering letter (Appendix A) accompanying the questionnaire (Appendix B) and the audit schedule (Appendix C) the aim of the research was briefly explained, and the respondent was also assured that the content of the questionnaire would be regarded as strictly confidential. The covering letter was handed out to management and supervision of the different manufacturing plants and was signed by the researcher. The covering letter also identified the
individual to whom the questionnaires must be returned with a specified return date for the completed questionnaire.

3.10 RESPONSE RATE

Questionnaires were handed out to employees on 27 October 2010 in various manufacturing companies. Respondents return the questionnaires by 19 November 2010. Twenty nine questionnaires were returned, which represent a response rate of 82%.

3.11 CONCLUSION

The purpose of this chapter was to document the research methodology that was used during the study.

In this chapter the researcher discussed sampling techniques as well as the development of the questionnaire. The research findings will be analysed in the following chapter to interpret how leading manufacturers employ shop floor management.

The research findings will be analysed in the next chapter to interpret what important shop floor management principles are implemented in automotive companies and how their employees benefit from these principles.
CHAPTER 4
RESULTS: PRESENTATION AND DISCUSSIONS

4.1 INTRODUCTION

In Chapter 3 the research methodology was discussed. In this chapter an analysis and interpretation of data obtained from the empirical study will be discussed. The objective of this chapter is to analyse the audit results and investigate the opinions of the respondents.

The objective of the audit and the questionnaire was to determine what shop floor principles are implemented in first class companies and what benefit the respondents get from the shop floor management principles.

The result of the audit and questionnaire are presented in this chapter. The questionnaire was designed to verify the information sourced during the literature study described in Chapter 2 and 3. The audit questions were designed to verify responses in the questionnaire.

4.2 RESOLUTION OF THE SUB-PROBLEMS

The main problem which was addressed in the research study was:

- Can Automotive Industry shop floor management systems be applied to a jobbing environment of the canopy manufacturing industry of SA Canopy?

The following sub-problems were indentified:

- What shop floor management system is utilised in the automotive industry?
- What shop floor management system is utilised in best in class companies?
What shop floor management principles should be implemented and how can they enhance the performance of SA Canopy

The sub-problems and what the literature revealed about the sub-problems will be discussed individually.

4.2.1 Sub-problem 1

What shop floor management system is utilised in the automotive industry?

In Chapter 2 a literature review was conducted which focussed on the shop floor management principles applied in the automotive industry. Literature revealed that there are six pillars / categories which are important for shop floor excellence in an automotive manufacturing concern. These pillars / categories were also individually analysed in detail to determine their role in the shop floor management process. The details in the six categories were used as the foundation for the construction of the audit schedule and questionnaire and on which the research was based.

An in-depth literature study of these categories and certain lean tools supporting them was also conducted. Information revealed in this study was also used to formulate certain questions in the shop floor audit checklist and questionnaire.

4.2.1.1 Results of audit and shop floor questionnaire.

Below in Table 4.1 is a summary of the audit results for the shop floor audits conducted in the 4 companies. All the companies audited are first tier OEM suppliers except for SA Canopy. The results of each company will also be discussed in detail in Table 4.2 to 4.3.
Table 4.1 Summary of audit results
Rating: 0 = Worst to 10 = Best

<table>
<thead>
<tr>
<th>Category</th>
<th>SA Canopy</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarity of vision</td>
<td>3</td>
<td>9</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Customer orientation (internal / external)</td>
<td>2</td>
<td>8</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Involvement of everybody</td>
<td>2</td>
<td>8</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Problem solving</td>
<td>1</td>
<td>9</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Leadership</td>
<td>2</td>
<td>9</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Management support system</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>

As one can see from the results each company has his own peculiar characteristics. Below in Table 4.2 and 4.3 the researcher discusses the results of each company with brief comments:

Table 4.2 Review of SA Canopy audit results

<table>
<thead>
<tr>
<th>Category</th>
<th>SA Canopy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarity of vision</td>
<td>3</td>
<td>The company has a vision but it is not displayed and understood by all employees in the organization.</td>
</tr>
<tr>
<td>Customer orientation (internal / external)</td>
<td>2</td>
<td>The understanding of customer expectations is not clear. Departments in manufacturing do not consider the internal customers when producing parts. No communication between departments exist to discuss concerns or improvement plans.</td>
</tr>
<tr>
<td>Involvement of everybody</td>
<td>2</td>
<td>Peoples’ opinion is not considered. Senior and middle management make most of the decisions in isolation.</td>
</tr>
</tbody>
</table>
Problem solving

1

Problem solving is non-existent. Problems are resolved based on past experience and not much training has been offered as yet. Records show that problems are not resolved and closed out properly.

Leadership (supervisor level)

2

Supervisors are not focussing on daily strategic issues. They are more involved with fire fighting than planning and controlling their manufacturing section.

Management support system

4

Because of the long history of the plant and its previous management style there was never any thought given to upgrading or changing the management system.

Table 4.3 Review of other companies audited

<table>
<thead>
<tr>
<th>Category</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarity of vision</td>
<td>9</td>
<td>8</td>
<td>9</td>
<td>Top management vision is shared amongst people and well accepted by everyone in the company.</td>
</tr>
<tr>
<td>Customer orientation (internal / external)</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>Company A &amp; B have a clear concept of customer orientation in place. Company C has evidence of customer orientation, however, everyone still seems more concerned about their own products.</td>
</tr>
</tbody>
</table>
There is an open atmosphere in all the companies and people are sharing ideas and complaints. Unions seem to have developed trust with management.

The analytical ability of company C is weak compared to the other two companies. There is a lack of sharing ideas among people.

Supervisor is liked by most people in his team / mini business. They are dedicated and consider problems and challenges.

Senior management is respected by most people in the organization and the presence of senior management on the shop floor is visible.

4.2.2 Sub problem 2

- Can the controls in the canopy manufacturing industry be enhanced by adopting the automotive industry shop floor management principles?

The results of the different sections of the questionnaire will be presented in this chapter. The questions from Section A were designed to verify the information sourced during the literature study described in Chapter 2. Finally a conclusion regarding the responses and the integration of the literature will be presented.
4.3 ANALYSIS AND INTERPRETATION OF RESULTS OF EMPIRICAL STUDY

4.3.1 Clarity of vision

Liker (2003:71) stated that throughout his visits to Toyota manufacturing plants in Japan and the United States one thing stood out. Every person he had talked to had a sense of purpose greater than earning a pay check. They felt a greater sense of mission for the company and could distinguish right from wrong with regard to that mission. They had learned the Toyota way from their sensei (mentors) and the message was consistent: do the right thing for the company, its employees, the customers, and society as a whole. Toyota’s strong sense of mission and commitment to its internal and external customers, employees, and society is the foundation for all other principles.

Table 4.4 shows the respondent’s opinions to the extent to which the mini companies mission statement are viewed in respect of guidelines in their daily performance, their understanding of the mini companies mission and how the mission supports the overall business mission statement.

Table 4.4 Responses to questions in Section 1.

<table>
<thead>
<tr>
<th>NO</th>
<th>QUESTION</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>My mini company has a clearly defined mission statement ?</td>
<td>52 (68%)</td>
<td>25 (32%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>2</td>
<td>The mission statement is important to the success of my team?</td>
<td>29 (38%)</td>
<td>42 (55%)</td>
<td>6 (7%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>3</td>
<td>The mini company’s mission statement is understood by all team members and team leaders ?</td>
<td>43 (56%)</td>
<td>32 (42%)</td>
<td>2 (2%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>4</td>
<td>The mini company’s mission statement supports the overall business mission statement ?</td>
<td>15 (19%)</td>
<td>55 (71%)</td>
<td>7 (9%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>
An analysis of Table 4.4 indicates the following:

- All respondents agreed that mini companies within their organization had a clear mission statement.
- 55% agreed that the mission statement was an important factor towards the success of their team.
- 56% of the respondent agreed that their mission statements were understood by all employees. 2% were of the opinion that their mission statement was not understood by all the team members.
- 71% of the respondents agreed that the mini company mission statement supported the overall business mission statement.

Analysing the results of Table 4.4 the findings are as follows:

Team leaders and team members are clear about the importance of having a clear vision / mission within their mini companies. Further all respondents agreed that the mission statement was important for the success of their teams. This is indicative of theory where Rubrick and Watson (2000:136) argue that a mission statement keeps the team focussed on their goals and that this statement defines the commitment of the team to achieve its goals. The results also support the theory of Rubrick and Watson (2000:136) that the team mission should support the overall company mission statement.

4.3.2 Customer orientation

Suzaki (1993:41) states that understanding your internal and external customer’s expectation is important to the effective operation of any organization. An understanding of customers expectation allows team members to better steer the company. As customer–supplier relationship becomes clear, collective focussing on customer satisfaction leads to work on continuous improvement and as history has shown there is no end to customer demands nor to improvements to meet these demands.

Table 4.5 shows the respondent’s opinions to the extent to which customer expectation is understood and how it impacts on daily performance and how the understanding of customer expectations drives continuous improvement.
### Table 4.5 Responses to questions in Section 2

<table>
<thead>
<tr>
<th>NO</th>
<th>QUESTION</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I understand my customer’s expectations?</td>
<td>43 (56%)</td>
<td>30 (39%)</td>
<td>4 (5%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>2</td>
<td>Understanding your customer expectations is important to the daily performance of you and your team members?</td>
<td>54 (70%)</td>
<td>21 (27%)</td>
<td>2 (3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>3</td>
<td>Feedback from your customers is important for continuous improvement?</td>
<td>49 (64%)</td>
<td>25 (32%)</td>
<td>3 (4%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Table 4.5 shows the respondent’s opinions on customer orientation within their organizations.

- 56% of the respondents strongly agreed that they understood their customers’ expectations.
- 70% of the respondents strongly agreed that customer expectation and the understanding thereof is important to the daily performances of teams and team members. As stated by Suzaki (1993:47) if a team or mini business unit focuses on its own interest, skills are possessed in a narrowly defined area of responsibility. Materials and information flow is disrupted because of people’s extreme self-interested. Organizations that share information have a more understanding and coordination development among people as a whole. Materials and information flow is smooth because of peoples’ customer-orientation approach.
- 64% of respondents agree that customer feedback is important for continuous improvement.
From the questions analysed in Table 4.5 the findings are as follows:

- The majority of the respondents agreed that understanding customer expectations is important. Suzaki (1993:63) supports this by stating that we should not lose perspective on how we would like to receive goods and services as a customer and how we need to provide these as a supplier. Everybody in the organization needs to understand and satisfy his or her customer’s needs to make the system work.

- Understanding customer requirements according to Suzaki (1993:63) will allow us to develop a total goal orientated organization as opposed to locally focussed (self-centred) organization. By understanding the customers’ needs, establishing the flow of work accordingly, and continuously doing these better, we can break cumbersome organizational barriers and shift towards a more progressive organization. As highlighted in the table above the respondents share the same opinion as Suzaki that understanding your customer’s expectations allows the team to be more effective.

### 4.3.3 Involvement of people

According to Competitive Dynamics International (2003:2) first line teams are where the real work takes place, this is where the value is being added. To become world competitive, a company needs world class teams and world class leaders.

Table 4.6 shows the respondents’ opinions regarding teamwork and the importance thereof, information discussed during team meetings, the development of training needs and their opinion regarding team leaders and middle management.
### Table 4.6 Responses to questions in Section 3.

<table>
<thead>
<tr>
<th>NO</th>
<th>QUESTION</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>People run their own mini companies?</td>
<td>56 (73%)</td>
<td>18 (23%)</td>
<td>3 (4%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>2</td>
<td>Is participation of all members in the mini business meetings important for the performance of your team?</td>
<td>53 (69%)</td>
<td>23 (30%)</td>
<td>1 (1%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>3</td>
<td>Is the information displayed and discussed in the meeting area useful and used to improve performance?</td>
<td>57 (74%)</td>
<td>19 (25%)</td>
<td>1 (1%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>4</td>
<td>My opinion in meetings is valued by middle and senior management?</td>
<td>34 (44%)</td>
<td>25 (32%)</td>
<td>14 (18%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>5</td>
<td>Is the shop floor organized in such a way that everyone understands the requirements and current performance?</td>
<td>54 (70%)</td>
<td>20 (26%)</td>
<td>3 (4%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>6</td>
<td>Are the capabilities of team members clearly understood and documented?</td>
<td>48 (62%)</td>
<td>25 (32%)</td>
<td>4 (6%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>7</td>
<td>Are development needs for team members documented and in line with the company and mini business unit objectives?</td>
<td>38 (49%)</td>
<td>36 (47%)</td>
<td>3 (4%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>8</td>
<td>Is effectiveness of training monitored and are actions implemented if training is not effective?</td>
<td>55 (71%)</td>
<td>14 (18%)</td>
<td>6 (8%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Table 4.6 shows the respondents’ opinions on customer orientation within their organizations.

- 49% of the respondents strongly agreed that mini companies / teams are run by people.
• 69% of the respondents agreed that participation of all members is important for the performance of their team. Rubrick and Watson (2000:106) argue that team members commitment to the purpose, goals and approach is critical to the success of the team. Team members not participating in group efforts will hold the team back. Rubrick and Watson (2000:107) state that one needs to provide an environment where team members can grow as this is the first step to a high performance team.

• 44% of the respondents agreed that their opinions are valued by middle and senior management. 18% of respondents are of the opinion that their opinions are not valued. Rubrick and Watson (2000:107) state that management support is critical to the success of the team and without this the team will almost certainly fail and recovering from such failure is extremely difficult.

• 70% of the respondents agreed that their workplace is organised in such a way that all team members clearly understand their current performance and future requirements.

• 62% of respondents agree that their capabilities are clearly identified and displayed. Rubrick and Watson (2000:109) state that training of individuals and team members is critical to the success of any team.

• 49% of the respondents strongly agreed that development needs are documented and in line with team and mini business objectives.

• 71% of respondents agreed that effectiveness of training is monitored and actions for improvement implemented if training is not effective.

From the questions analysed in Table 4.6 the findings are as follows:

• The respondents feel that they run their own mini companies and teams. According to Suzaki (1993:76) this is important for an successful organization due to the following:
  o It develops a sense of ownership
  o It helps people to focus on clear objectives
  o Barriers are reduced between different units in the organization
  o By putting things on paper and displaying them, more things will be clarified to develop enhanced commitment from everyone.
o More people will be able to participate in identifying areas for improvement.

- The majority of respondents agreed that the shop floor is organised in such a way that everyone understands requirements and current performance. There are many sayings such as "seeing is believing," or "a picture is worth a thousand words" or even "show me." Of the five senses, humans are said to process more than 80% of the information from their environment through their sense of sight. [http://www.gemba.com/Tool-kit.cfm?id=637](http://www.gemba.com/Tool-kit.cfm?id=637)

Visual controls that were observed during the company audits were as follows:

- Production, delivery and schedule adherence
- Quality performance. internal and external
- Facility designation and identification
- Equipment maintenance
- Standard work
- Skill availability (ILU charts)
- Team or cell productivity
- Material flow and movement

As previously mentioned by the researcher the companies evaluated are first tier OEM suppliers and with the level of visual management implemented it is clear that visual control plays a critical part in shop floor management.

### 4.3.4 Problem Solving

According to Liker (2004:191) in the conventional automotive plant, white collar or skilled-trade staff are responsible for problem solving, quality assurance, equipment maintenance and productivity. By contrast, shop floor work groups are the focal point for problem solving in the Toyota production system. The associates who perform the actual work are the most familiar with the work and the actual problems that affect the work. Since Toyota believes that to add
value for its customers it is the members who do the value added work, therefore team members are the top of the hierarchy.

Table 4.7 shows the respondents’ opinions on problem solving within their organizations.

**Table 4.7 Responses to questions in Section 4**

<table>
<thead>
<tr>
<th>NO</th>
<th>QUESTION</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is being trained in problem solving beneficial in performing my daily function?</td>
<td>54 (70%)</td>
<td>20 (26%)</td>
<td>3 (4%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>2</td>
<td>Is my opinion in problem solving activities valued?</td>
<td>46 (60%)</td>
<td>25 (32%)</td>
<td>6 (8%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>3</td>
<td>Do team based problem solving activities have benefits to individual problem solving activities?</td>
<td>57 (74%)</td>
<td>20 (26%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>4</td>
<td>Are all the problems in the organization communicated timorously and does everybody understand the impact of the problem on the company’s performance?</td>
<td>48 (62%)</td>
<td>25 (32%)</td>
<td>4 (6%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

An analysis of Table 4.7 indicates the following:

- 70% of the respondents are of the opinion that it is beneficial to be trained in problem solving. Suzaki (1993:32) states that it is important for every employee to possess problem solving skills to allow the organization to be more responsive to customer demand.
- 60% of respondents feel that their opinions are valued in problem solving meetings.
- 74% of the respondents are of the opinion that team based problem solving is more beneficial than individual problem solving.
• 62% are of the respondents feel that problems are communicated timeously and all team members understand the impact of the problem on the business.

From the questions analysed in Table 4.7 the findings are as follows:

• All the respondents feel that training in problem solving is important to the performance of the business. As stated by Suzaki (1993:176) in order to achieve shop floor excellence we need to satisfy our customer, involve everybody, upgrade skills, and acquire problem solving skills.

• 74% of the respondents agreed that team based problem solving has benefits to individual problem activities. Suzaki (1993:177) argues that team based problem solving is not easy especially if the team is new. If the team is inexperienced, developing trust and honesty is important. Practicing problem solving as a team is commonly used in Japan with great success.

• The majority of the respondents are of the opinion that their input is valued in problem solving activities. Suzaki (1993:199) states that for any type of problem solving to be meaningful managers need to make the process customer friendly so that people can have a desire for self improvement. Solving problems as a team requires the initiative of people, effective guidance and facilitation, and a supportive environment. A team should behave like a mini company to accomplish its mission.

4.3.5 Leadership

Suzaki (1993:70) states that supervisors have an obligation to those who provide the resources and they must be able to describe the way the mini company is run, motivate team members to get the job done, execute plans as agreed, and summarise and report back to management. Table 4.8 shows the respondents’ opinions on leadership within their organizations.
Table 4.8 Responses to questions in Section 5.

<table>
<thead>
<tr>
<th>NO</th>
<th>QUESTION</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>My team leader understands the company’s mission, and works towards achieving it?</td>
<td>39 (52%)</td>
<td>28</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>My team leader continuously challenges me to improve?</td>
<td>53 (69%)</td>
<td>23</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Mini business members / team leader discuss share ideas and problems are discussed openly?</td>
<td>57 (74%)</td>
<td>19</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>It is important for your leader to win as a team rather than an individual?</td>
<td>34 (44%)</td>
<td>25</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Interest is shown by senior management in team performance and is their presence on the shop floor visible?</td>
<td>54 (70%)</td>
<td>20</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

An analysis of Table 4.8 indicates the following:

- 72% of the respondents agreed that their supervisors understand the company’s mission and that they work towards achieving it.
- 69% of the respondents agreed that they are continuously challenged by their supervisor to improve.
- 74% of the respondents are of the opinion that they have an open communication channel with their supervisors and that problems and improvement opportunities are discussed openly.
• 44% of the respondents feel that teamwork is important. 18% of the respondents are still of the opinion that supervisors still think it is more important to perform as an individual.
• 70% of the respondents stated that senior management shows interest in the performance of the team and that they are present on the shop floor.

From the questions analysed in Table 4.8 the findings are as follows:

• It is clear that supervision must understand the company vision and that they should work towards achieving it. According to Suzaki (1993:71) supervision needs to develop goals and approaches to achieve these. They also need to ensure that these approaches and goals are in harmony with the overall strategic direction of the company.
• Working with team members is important and challenging them to improve is a vital part of the supervisors’ daily functions. Suzaki (1993:71) states that supervisors must provide the necessary training and guidance to achieve goals as a group.
• Importance of senior management being present on the shop floor is highlighted by 70% of the respondents.

4.3.6 Management process
As goals are set we need to achieve them. One of the tools to use is the PDCA cycle as a basic management discipline. In shop floor activities the PDCA may involve an hourly review of production goals or quarterly review of operations. The effectiveness of the PDCA cycle is in the way the meeting are conducted (Suzaki:1993:235).

Table 4.9 shows the respondents’ opinions on the management process within their organizations.

Table 4.9 Responses to questions in Section 6

<table>
<thead>
<tr>
<th>NO</th>
<th>QUESTION</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
</table>
An analysis of Table 4.9 indicates the following:

- 70% of the respondents are of the opinion that the information displayed in their plants is sufficient and important for them to perform effectively.
- 64% of the respondents are of the opinion a management process is required and that the PDCA cycle is working for them.
- 56% of respondents feel that their reporting process is accurate.
- 61% of respondents agree that problem solving tools are important and provide them with the required information to take action.
- 75% of respondents feel that people take responsibility for improvement plans and that they are executed timorously.
- 60% of respondents agree that improvement plans are reviewed in an appropriate manner.

From the questions analysed in Table 4.9 the findings are as follows:
• As indicated by 70% of the respondents the information displayed in the company is important to manage and perform effectively. According to Suzaki (1993:246) one needs to have visual display boards to post key management indices. These indices are used by world class organizations to plan and monitor direction, plan, update and monitor progress towards achieving goals.

• Respondents are in agreement that some sort of management process is required to monitor and plan their activities.

• Management process like the PDCA cycle is important as it enable us to manage our organizations and to check our own progress and also inform our management of our progress.

4.4 CONCLUSION

The purpose of Chapter 4 was to analyse and interpret the data obtained through the plant audits and research questionnaire. The analysis and interpretation was undertaken in terms of the objectives stated in Chapter 1. The evaluation done by the researcher indicates that the guidelines for an effective shop floor management indentified in Chapter 2 are being applied by all the companies evaluated.

Chapter 5 will focus on recommendations, based on the above findings to develop an effective shop floor management system for SA Canopy.
CHAPTER 5
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION
This chapter provides a brief summary of the results of the research conducted at various component manufacturing plants as well as at SA Canopy. The purpose of the research, as stated in Chapter 1, was to establish if:

Automotive Industry Shop Floor Management Systems can be applied to the jobbing environment of canopy manufacturing industry of SA Canopy?

5.2 SUMMARY OF RESEARCH
Taking into consideration the sub-problems in Chapter 1, the research has shown the following:

- The literature study indicates that shop floor management is a key management principle in any organization not only in OEM component manufacturing plants.

- It appears that excellence in shop floor management is important in any organization to drive continuous improvement.

- Literature also revealed that people are the most important asset in any organization and that this resource should be fully utilised to achieve world class status.
Information gathered from the audits and questionnaire support literature in that all the top component suppliers to OEMs have a well developed shop floor management system in place and that people are seen as their most valuable assets.

5.3 CONCLUSION FROM RESEARCH

The primary objective or main problem mentioned in Chapter 1 was:

Can Automotive Industry Shop Floor Management Systems be applied to the jobbing environment of canopy manufacturing industry of SA Canopy?

In order to address the above mentioned primary objective, the following secondary objective needs to be investigated:

- What shop floor management principles should be implemented and how can it enhance the performance of SA Canopy?

In Chapter 2 shop floor management principles practised by world class organizations were identified in the literature. These principles were researched during the audits and questionnaires distributed to the several best in class companies.

Literature revealed that the main shop floor management principles associated with a world class organization are as follows and there must be:

- A clear mission.
- Customer orientated
- Involvement of everybody (teamwork)
- Well developed problem solving skills throughout the organization
- Good leadership at shop floor level
- Well entrenched management processes

5.4 RECOMMENDATIONS FROM THIS RESEARCH
In order to change the current top down management style at SA Canopy and to create a new perspective of the shop floor the researcher base on what researched revealed, recommends the following:

**5.4.1 Recommendation 1**

As literature in chapter two section: 2.3.1 and the research have revealed it is important for any company to have a clear mission statement. Literature revealed that a mission statement is not only a collection of words it helps people to understand the companies situation, values, responsibilities and vision. Team mission statements are closely linked to the overall company statement.

Based on the literature and research the researcher recommends the following. In order for SA Canopy to adapt to the changing environment from jobbing shop to OEM supplier it is important to develop a clear company mission statement which is channelled down to the shop floor. This will align the focus of all employees in the organization to achieve the company objectives.

**5.4.2 Recommendation 2**

The research revealed that a high number of operators and supervisors are of the opinion that understanding your customer’s expectation is important in the daily functioning of their team and company. Evidence indicates that customer supplier relationships are an important shop floor management principle which was implemented in all companies audited. Research revealed that understanding customer supplier relationships develops a clear understanding of the importance of each process in getting the job done and meeting your customers expectations. Literature in chapter two section:2.3.2 revealed that understanding your customers expectation allow people to take more ownership, improve quality and through put.

As research revealed SA Canopy do not consider internal departments as customers. SA Canopy employees only focus on completing their own tasks without considering the expectation or requirements of the down stream process. In order for SA Canopy to understand and improve their customer
supplier relationship the researcher recommend that a customer supplier relationship chart for every department or team is developed and displayed. As revealed by the literature these charts need to be updated daily indicating satisfaction levels and actions to improve satisfaction levels. Research has revealed that relationship charts can benefit SA Canopy in the following ways:

- Developing a broader picture of one’s job.
- Identifying key customers and suppliers
- It clarifies interrelationships of organizations that cannot be easily conveyed by a traditional pyramid shaped organizational chart
- Clarifying roles and responsibilities
- Educating new employees
- Focusing people’s efforts on customer satisfaction

5.4.3 Recommendation 3

Literature in chapter two section:2.3.3 and research has revealed that involvement of everybody (teamwork) is important in any world class organization. Team members work together to achieve team and company objectives. Have teams that allow the members to participate in decision making. Research also revealed that all the teams are organised in such a way that everyone understands the requirements and current performance. Capabilities of team members are documented and understood by supervision and action plans are in place to improve skills levels not up to standards.

Research has revealed that there is no teamwork at SA Canopy and people’s opinions are not considered. The majority of decisions are made by management and middle management. Skill levels of employees are not documented and current performance and requirements are not displayed and understood by employees. Based on the research and literature the recommendation by the researcher for SA Canopy is as follows:

- Establish mini business units (teams)
- Introduce visual management where quality, safety, cost, delivery and morale are displayed in the team meeting area.
• Evaluate the capabilities of all employees and display these with improvement plans in meeting areas
• Develop a suggestion scheme where employees opinions and input can be utilised towards continuous improvement.

5.4.4 Recommendation 4

Literature in chapter two section:2.5 and research has revealed that effective problem solving is a key shop floor management principle in any world class company. Literature revealed that given the opportunity most people can solve problems and that this ability should be utilised by the company. Exposing problems (by enforcing problem solving), supporting problem solving activities, implementing solutions and standardisation should go hand in hand. Evidence during the audits of different companies proved that problem solving is utilised effectively by all as a tool for continuous improvement.

Research also revealed that problem solving at SA Canopy is non-existent. Problems are not effectively resolved and most problems are re-occurring problems. Based on the research and what was revealed in the literature, SA Canopy needs to develop a culture of continuous improvement by enforcing problem solving.

5.4.5 Recommendation 5

Research revealed that all supervisors and team leaders have a clear understanding of the company’s mission and work towards achieving it in a world class company. Supervision and team leaders are at such a level that they are capable of challenging people to improve. Team performance rather than individual performance is important to supervision in these organization.

Research at SA Canopy revealed that supervision is not at the level required in a world class organization. Supervisors consist of personnel promoted as a result of years of service and not on capability. Supervisors act more like senior operators and they do not promote continuous improvement. Based on the research and literature, supervisors at SA Canopy need to be placed on a development programme to improve their management capabilities in respect of leadership, transformation management and problem solving.
5.4.6 Recommendation 6

Literature and research revealed that providing people with sufficient information plays an important role in planning activities and implementing improvement actions. The display of information for example Pareto diagrams provides team members with information to take action against potential problems. Literature and research revealed that any world class organization has a management process in place. The organizations researched make use of the Plan, Do, Check, Action (PDCA) management process.

Based on the history of SA Canopy (jobbing shop) and as per the evidence revealed by the research past management did not see the need for changing or implementing a management process. Moving into the OEM supply arena SA Canopy will have to revisit the way they conduct business and to ensure that actions are implemented and followed through one will have to look at implementing a management process. Base on the literature study and the research it is recommended by the researcher that SA Canopy implement the PDCA management process. In addition according to literature and research key data needs to be displayed so that employees can plan and respond more effectively.

5.5 OPPORTUNITY FOR FURTHER RESEARCH

This research paper provided insight to the key shop floor management principles utilised in the automotive industry and best in class companies. During the research process, opportunities for further research has been identified:

- The impact of implanting Lean Manufacturing on the performance of SA Canopy.

  A study could be conducted to investigate the benefits that could be derived from implementing lean manufacture at SA Canopy.

5.6 SUMMARY

The research conclusion was presented which indicated that key shop floor management principles applied in world class organizations can be
implemented at SA Canopy. Recommendations were made as to what management principles should be implemented at SA Canopy. The recommendations are aimed at shop floor level where excellence is required.

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*Shared Vision*. [Online] Available: 

Shilan, J. *The Importance of SOP’s*, [Online], Available:  


The Guide to Managing for Quality. Identify problems , [Online], Available:
20 October 2010

Dear Sir,

I am a MBA Student at the Nelson Mandela Metropole University (NMMU) currently completing my final year. As part of my course, research needs to be conducted in the form of a treatise to be submitted to fulfil the requirements of the MBA course. The main aim of the research is to investigate the shop floor management principles implemented in your plant.

I would like to request permission to conduct this research in your plant. The research will be conducted on a one-on-one basis in the form of a questionnaire and a plant audit. An effort will be made to ensure that production is not adversely affected during the research. The responses to the questionnaire and audit findings will be held confidential.

Thank you for your co-operation.

Yours sincerely,

Jacques Swart
Manufacturing Manager SA Canopy.
APPENDIX B

SHOP FLOOR QUESTIONNAIRE

Please Tick:  □  Supervisor / Team leader
              □  Team member

<table>
<thead>
<tr>
<th>NO</th>
<th>QUESTION</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The mini company has a clearly defined mission statement?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>The mission statement is important to the success of my team?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>The mini company’s mission statement is understood by all team members and team leaders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>The mini company mission statement supports the overall business mission statement?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
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</table>

CUSTOMER ORIENTATION:

<table>
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<th>NO</th>
<th>QUESTION</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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<td>I understand my customer’s expectations?</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Understanding your customer expectations is important to the daily performance of you and your team members?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Feedback from your customers is important for continuous improvement?</td>
<td>1</td>
<td>2</td>
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<td><strong>INVolMENT OF EVERyBODY:</strong></td>
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</tr>
<tr>
<td>1</td>
<td>People run their own mini companies?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Participation of all members in the mini business meetings is important for the performance of your team?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Information displayed and discussed in the meeting area is useful and is used to improve performance?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>My opinion is valued by middle and senior management?</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Is the shop floor organized in such a way that everyone understands the requirements and current performance?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>The capabilities of team members are clearly understood and documented?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Development needs for team members are documented and in line with the company and mini business unit objectives?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Effectiveness of training is monitored and actions implemented if training is not effective?</td>
<td>1</td>
<td>2</td>
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<td><strong>PROBLEM SOLVING:</strong></td>
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<tr>
<td>1</td>
<td>Being trained in problem solving is beneficial in performing my daily functions?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
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<td>2</td>
<td>My opinion in problem solving activities is valued?</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>3</td>
<td>Do team based problem solving activities have benefits to individual problem solving activities?</td>
<td>1</td>
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<td>4</td>
<td>Are all the problem in the organization communicated timorously and does everybody understand the impact of the problem on the</td>
<td>1</td>
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<tr>
<td>1  My team leader understands the companies mission, and works towards achieving it?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2  My team leader continuously challenges me to improve?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<tr>
<td>3  Mini business members / team leaders discuss and share ideas and problems are discussed openly?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>4  It is important for your leader to win as a team rather than an individual?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tr>
<tr>
<td>5  Interest is shown by senior management in team performance and their presence on the shop floor are visual?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>MANAGEMENT PROCESS:</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1  Data displayed in your plant provides you with sufficient information to plan you activities and to respond to under performance?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2  PDCA cycle ensure an effective management cycle?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3  Our reporting process is accurate and responsive?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4  Problem solving tools like pareto diagrams, cause and effect diagrams provide me with sufficient information to take action against potential problems?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5  People take ownership in executing improvement plans?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6  Progress of action / improvement plans are reviewed in an appropriate manner?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
# APPENDIX C

## COMPANY AUDIT SCHEDULE

1 = No Compliance  
2 = Partial Compliance  
3 = Full compliance

<table>
<thead>
<tr>
<th>NO</th>
<th>AUDIT CRITERIA</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>CORE VALUES:</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Does mini companies have a clear mission?</td>
<td>1 2 3</td>
</tr>
<tr>
<td>2</td>
<td>Do people take ownership in our organization mission and measure behaviour against it?</td>
<td>1 2 3</td>
</tr>
<tr>
<td>3</td>
<td>Is there a clear understanding of how our organization mission ties to the company’s mission?</td>
<td>1 2 3</td>
</tr>
<tr>
<td></td>
<td><strong>CUSTOMER ORIENTATION:</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Do people know who their customers are, both internal and external?</td>
<td>1 2 3</td>
</tr>
<tr>
<td>2</td>
<td>Do people frequently talk to internal customers?</td>
<td>1 2 3</td>
</tr>
<tr>
<td>3</td>
<td>Do people monitor the level of customer satisfaction?</td>
<td>1 2 3</td>
</tr>
<tr>
<td>4</td>
<td>Are customer satisfaction indices improving?</td>
<td>1 2 3</td>
</tr>
<tr>
<td>5</td>
<td>Are there clear communication channels in the organization?</td>
<td>1 2 3</td>
</tr>
<tr>
<td>6</td>
<td>Do people understand the role of other mini companies?</td>
<td>1 2 3</td>
</tr>
</tbody>
</table>
**INVolVEMENT OF EVERYBODY:**

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do people understand and have a sense of running their own mini companies?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Is there a shared understanding among people regarding the direction of the company and each person’s contribution towards achieving goals?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Are there measurable levels of people’s involvement e.g. absenteeism, number of suggestion, etc?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Is the shop floor organized in such a way that it is easy even for strangers to understand what is going on?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Are standards upheld by everyone and have people been creative in making standards easy to use even by new employees?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Are main steps and key items clearly stated in the standards?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Are standards updated frequently with records of reasons for updating?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Are corrective action procedures in place if standards are not met?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**PROBLEM SOLVING:**

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Are there training programs in the organization according people’s skills and needs?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>How is the effectiveness measured of these training programs?</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Is there a process of prioritizing the major concerns in the mini companies and are these addressed by means of the</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>PDCA cycle?</td>
<td></td>
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<td>---</td>
<td>---------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>4</td>
<td>Are there team-based problem solving activities in place?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Are problem solving skills used without difficulty by teams?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Is data effectively utilized close to the action e.g. in the mini company?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Do problem solving activities contribute to the performance of the company?</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tbody>
</table>

**LEADERSHIP:**

<p>| | | | | |</p>
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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Is there a shared understanding of the company’s mission?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Are there a spirit to challenge conventional wisdom?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Are people sharing and discussing ideas openly as a team?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Does the leader empathize with peoples growth?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Does the leader spend time on the shop floor talking with people and caring about how things are going?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**MANAGEMENT PROCESS:**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is the PDCA cycle practised throughout the hole management process?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Is there a proper information gathering and analysis process with actions established?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Is there a comprehensive reporting procedure that everyone understand in the company?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Question</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>4</td>
<td>Is the reporting process accurate and responsive?</td>
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<tr>
<td>5</td>
<td>Are problem solving tools such as pareto and cause and effect analysis used in the organization to resolve major concerns in the company?</td>
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</tr>
<tr>
<td>6</td>
<td>Is there a clear plan to address problems in the organization?</td>
<td></td>
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<tr>
<td>7</td>
<td>Do team leaders and members take ownership of the plan?</td>
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<tr>
<td>8</td>
<td>Is there a clear check / audit and follow up cycle of the plan?</td>
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</tbody>
</table>