THE IMPACT OF SHIFTWORK ON PRODUCTIVITY

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TITLE: AN INVESTIGATION INTO THE IMPACT OF SHIFTWORK ON PRODUCTIVITY.

DECLARATION:

IN ACCORDANCE WITH THE RULE: G4.6.3, I HEREBY DECLARE THAT THE ABOVE MENTIONED TREATISE IS MY OWN WORK AND THAT IT HAS NOT BEEN SUBMITTED FOR ASSESSMENT TO ANOTHER UNIVERSITY OR FOR ANOTHER QUALIFICATION.

SIGNITURE:

DATE: 30TH NOVEMBER, 2009

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ABSTRACT

Shiftwork is common in the private sector but not exclusive from the public sector like nursing. In order to secure a continuous operation, and optimization of equipment, businesses introduced shiftwork. The author wanted to test certain hypotheses to better understand the impact of shiftwork.

In this research the author first embarked on a theoretical study into shiftwork and its associated problems, which include the impact on productivity, the impact on the employer's attitude towards the work, the impact on the family life, the impact on social life, the impact on physical health and the psychological effects.

Thereafter, an empirical study was conducted to ascertain to what extend shiftwork affects productivity and the life of the employees. The data was then analysed to explain the impact of shiftwork and productivity. Lastly, recommendations were made based on the research.

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CHAPTER 1

THE IMPACT OF SHIFTWORK ON PRODUCTIVITY

1. INTRODUCTION

Shift work has become a permanent and extensive feature of contemporary industrial society (Mott, Mann, McLoughlin and Warwick, 1965). The impact of shift work has become significant on the shift-worker as well as on the business. A good night's rest is a rare treat for any shift worker. Employers often struggle to understand certain behavioral patterns of their employees, and how to deal with those problems.

Challenged by the normal cycle of urban life and resisted by the natural rhythms of the body, the shift –work cycle represents a violation of a centuries old pattern of day and night. As a result, shift workers have great problems in getting to sleep, and they are more tired at work (Mott, Mann, McLoughlin & Warwick, 1965).A differentiated analyst of the different shift systems adds significance to our understanding of the impact of shifts. Apart from protecting the bottom line, businesses are trying to understand what employee assistance programmes to use when job performance are impaired by personal problems, of which shift work ca be the reason.

Absenteeism has become a real concern in the manufacturing industry and this study will only focus on the Cadbury confectionary plants. It causes disruption in the production processes, and therefore increases productivity cost. With the worsening economic situation in the country, any extra cost to the product will have a negative impact on profits. This study will focus on the impact of absenteeism in a continuous shift operation, and how it directly affects cost of manufacturing.

Shift work also has a direct impact on the shift-worker and his life at work and not at work. Shift workers have become more diverse in South Africa, and the majority of shift workers still remain predominantly black.
The time these people have to spend away from home, which includes traveling, is part of apartheid legislation. The study will take a look at how this impacts shift workers life. Previous studies have shown that more injuries take places at night then during the day (Venter 1974). The reason overwhelming given for this high accident rate was that there is an inherently tiredness at night.

The study will focus on how accidents and illnesses related to shift work. Medical facilities are very important to provide proper assistance and service to shift operations. The study will look at the current facilities, the targeted time of focus and compare it with other manufacturing plants also operating a continuous operation. It is important to understand whether shift work; working conditions create particular health and safety problems. Family relation and social participation forms an integral part of any person's life. We will take a look at how social relations, domestic relations, childcare and education are being affected by shift work.

2. PROBLEM STATEMENT

The impact of shift work has many negative effects on the shift worker, his/her work and the social life. The study is to assist the employer to have a better understanding on the impacts of shift work. Literature indicates that shift work has been a reality for most part of human history, but was initially only for a selected few professional groups for example doctors, soldiers and nurses.

Increased demand put pressure on the manufacturer to increase supply. In order to avoid production on another production line, the most logical way is to increase the shifts worked on a production line.

Fixed cost can then be shared amongst all the shifts and therefore reduces manufacturing cost. Capital investments support new technology and in order to deliver paybacks on such expenditure, maximum use and output is required.

Workers who moved from shift work to normal day work had fewer complaints as regards physical and mental health, their sleep improved and their sick leave requirements diminished (Akersstedt and Torsavall 1978a and b).According to the Industrial Health Research Group (IHRG), workers are of the view that more injuries take place at night then during the day. The overwhelming reason given for this high rate was that there is an inherent tiredness at night.

The study will focus on the following areas where the shift worker and the employer are negatively affected by shift work.

- Effects on physical health
- Effects on family relations and social participation
- Psychological effects of shift work
- Attitude towards shift work
- Impact on the organization

3. RESEARCH OBJECTIVES

3.1 Primary objective

The main objective of the study is to improve employee productivity by investigating the influence of shift work on employee work attitudes. The study also investigates the relationship between shift work, employee social life and productivity.

It is furthermore to help the employer to develop programmes to assist the shift workers to deal with shift related problems. The financial implications of absenteeism due to shift work can be enormous and the employer needs to understand exactly how to deal with it.

3.2 Secondary objectives

To achieve the primary objective, the following secondary objectives will be pursued:

- To investigate the impact of shift work on the attitude of the shift worker towards his/her job
- To investigate the impact of shift work on the family life of the shift worker,
- To investigate the impact of shift work on the social (leisure activities, relatives and friends) life of the shift worker,
- To investigate the impact of shift work on the physical health of the shift worker,
- To investigate the psychological effects as a result of shift work.
- To investigate the impact on the productivity as a result of shift work
- To investigate the impact on shift work on absenteeism

3.3 Research design objectives

The following research design objectives will be pursued in this study:

- To conduct a secondary literature review on the nature of shift work, classification of shift systems, the reasons for shift work and problems associated with shift work.
- Based on the secondary objectives, to construct a questionnaire which will be used to collect the primary data on the impact of shift work on the attitude of the shift worker towards the job, the impact on the social life of the shift worker and on the productivity of the business.
- To finalize the questionnaire and seek ethics clearance for the questionnaire from the NMMU Ethics Committee.
- To execute the data collection process handing out the questionnaires to a stratified sample of at least 100 respondents representing the manufacturing departments.
- To capture the data on the Excel computer software program.

- To analyze the data using the STATITICA computer software program.
- To interpret the findings and make conclusions.
- To provide recommendations to the executive management of Cadbury South Africa.

3.4 The hypotheses

The following hypotheses are formulated:

H01: The introduction of shift work is in no way detrimental on the attitude of the shift worker towards the job

H02: The family life of the shift worker is not affected by shift work

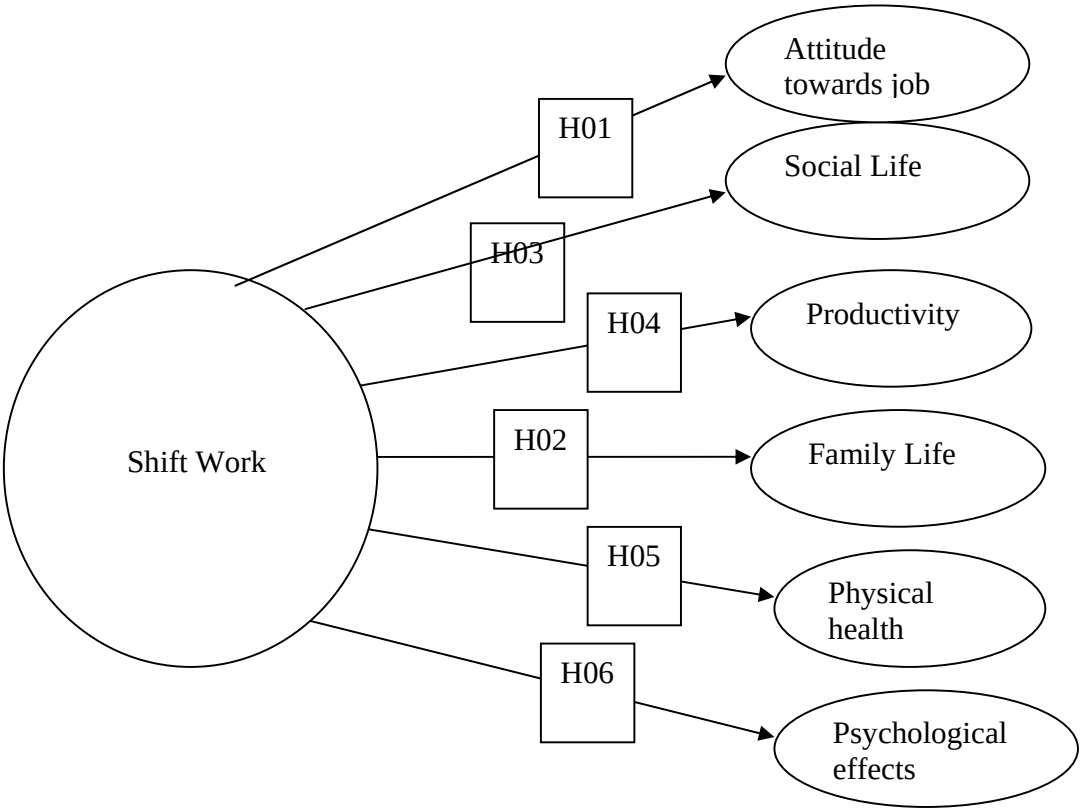
H03: Shift work does not affect the social life of the shift worker

H04: Shift work does not affect productivity

H05: Shift work does not affect the physical health of the shift worker

H06: Shift work does not have psychological effects on the shift worker

FIGURE 1: THE RELATIONSHIPS BASED ON THE NULL HYPOTHESES



4. RESEARCH METHODOLOGY

Research methodology, also known as the research paradigm, is the way one thinks about research, how one collects and analyses the data and the way in which one writes the dissertation. Two types of paradigms have been identified, namely the qualitative and quantitative paradigms.

Qualitative paradigm is concerned with qualities and non-numerical characteristics while a quantitative paradigm is all about data that is collected in a numerical form. A phenomenological paradigm tends to produce a qualitative data and a positivistic paradigm tends to produce a quantitative data (Collis & Hussey, 2003).

The main advantage of a quantitative approach to data collection is the relative ease and speed which the date can be collected. In this paradigm it is possible to use large samples while in a qualitative paradigm sample size may be small. For example a case study may consist of one respondent. A qualitative data collection method can be expensive and time consuming, although it can be argued that qualitative data provide a more real basis for interpretation and analysis.

The research project will follow a quantitative paradigm because of the nature of the problem statement which requires the researcher to measure the relationship between shift work, employee social life and productivity.

4.1 The sample

Convenience sampling will be used to select a sample of 300 staff members at three comprehensive universities.

A structured questionnaire will be distributed to about 100 shift workers currently employed by Cadbury South Africa. Anonymity and confidentiality will be strictly guaranteed. Follow-ups will be conducted to ensure a good response rate.

4.2 The measuring instruments

The Cronbach alpha (1951) will be used to test the reliability of the study.

Alderfer's (1969) instrument will be used to measure the impact of shift work on the employee's attitude towards the job, on the employee's social life and on the productivity.

The questions for the study will be based on a four-point Likert scale ranging from strongly disagrees to strongly agree.

5. OUTLINE OF THE STUDY

The research has planned to include the following chapters:

Chapter 1: Problem statement and definition of concepts.

Chapter 2: History of shift work within the legal framework in South Africa. The chapter will also deal with literature from previous studies on the attitude towards the work, the impact on family life, the impact on social life, and the impact on productivity.

Chapter 3: The impact of shift work on employees. The chapter includes the impact on physical health, the impact on family life and the psychological effects due to shiftwork.

Chapter 4: Research design

Chapter 5: History of Cadbury. This chapter gives a brief overview of the place where the study is conducted.

Chapter 6: Data analysis and interpretation.

Chapter 7: Conclusions and recommendations.

6. CONCLUSION

Increasing demand pressures forces businesses to work continuous operations, which involve shiftwork. This study will assist Cadbury Port Elizabeth to better understand the associated problems that comes with shiftwork, and it includes the impact on productivity.

Chapter two will focus on the History of shift work within the legal framework in South Africa. The chapter will also deal with literature from previous studies on the attitude towards the work, the impact on family life, the impact on social life, and the impact on productivity.

CHAPTER 2

HISTORY OF SHIFTWORK WITHIN THE LEGAL FRAMEWORK IN SOUTH AFRICA

2.1 INTRODUCTION

The purpose of Chapter two is to provide an overview of the history of shift work with special reference to the legal framework in South Africa. Shiftwork can be in the form of either 8 hours a day or the compressed work week (CWW), which was first introduced in the early 1970s. The trend in manufacturing is for employers to run machines 24 hours a day, seven days a week in stead of buying more machinery and run them only on day shifts. Many of the businessmen in the developing countries wish to make a quick return on their investment, capital and machinery in the way of working excess hours to increase production. Businesses are therefore introducing shift work and overtime jobs, but it has not been without risk factors like fatigue, symptoms of various illnesses, tiredness and maladaptation (Kawakami et al., 1994; Costa, 1996, 1997). With business being driven to maximize outputs, an idle machine is considered lost opportunities and profits. We all know that concern for the health and well-being of workers ranks a very distant second to employer desires for increased profits.

There are literally dozens of ways to structure shifts. In general they can focus on including or excluding night work; they can include or exclude weekend work or parts thereof; they can vary concerning flexibility of working times (e.g. rotating, permanent, split shifts) or the regularity or irregularity of the shift cycle (Costa, 2003). Other reasons for the increased shift work can be two-fold and closely linked as follows: the increased need for temporal flexibility of the organisation, as well as the economic necessities.

Temporal flexibility is seen as one of the milestones of labour flexibility on which most organisations are currently focused (Costa, 2003).

In this context, shift work is a widely used tool enabling the organization to be active around the clock in response to increasingly flexible market demands.

Human beings have certain habits where the activity and wakefulness are concentrated during the day, and rest and sleep are at night. Due to these habits, workers carry out their activities during the day and reserving the night for sleep. However, millions of workers invert their biological rhythm of activity and rest in order to do their job; they are called shift and night workers. An extensive body of research shows that shift work causes potentially adverse physical and emotional health effects (Costa, 2003; Knutsson, 2003, Knutsson et al., 2004). The detrimental effects of shift and night work are not experienced to the same degree by all workers, although a large percentage suffer sleep problems, fatigue, tiredness, performance decrements, and psychological disturbances, as well as cardiovascular and gastrointestinal complications, among others (Costa, 1996, 2003; Pati et al., 2001). Sleep disturbances are mainly due to a disruption of circadian rhythms as some sleep components, such as the duration and sleep architecture, are controlled by the biological clock (Dijk and Czeisler, 1995). Consequently, shift- and night-workers are susceptible to difficulties in sleeping deeply and for an adequate period of time (A˚ kerstedt, 1998; Ingre et al., 2004; Nakata et al., 2004; Portela et al., 2004; Santos et al., 2004). Shift work can also in many cases disrupt community activities, social and religious practices, (Mott et al., 1965; Monk and Wagner, 1989).

2.2 DEFINITIONS

The study will look at different applications and definitions of shift work in industry. The term shift work has been used in different ways in the scientific literature. A narrow definition of shift work is a work schedule in which a worker replaces another on the same job within a 24 hour period. While there are no set and agreed upon terms used to define shift work, the writer will use some basic definitions for the purpose of the study.

It is important to note the different approaches that can be used in continuous production. The following shift patterns are used by Cadbury South Africa:

- Day shift – the most common shift for workers with the hours being between 6 am and 6pm.
- Afternoon Shift – the hours being from 10h00 pm to 06h00 am.
- Fixed Rotating Shift – a work schedule where the time of work is always the same, but the days worked changes. First evening or night shift. This is used in continuous operations.
- Rotating Shift – a work schedule where the shift time changes, usually on a weekly basis and the days worked also change. This is used in continuous operations.
- Compressed Work Week – a compressed work week is when workers work 40 hours per week but in less then five days and usually for ten or twelve hours per day.
- Normal Work Week – a normal work schedule is usually considered five days a week and eight hours per day. In the rest of the industrialized world the work week gets shorter and not longer.

There is one other shift schedule that allows employers to operate continuously without having to face rotating shifts. In this case plants will work eight hour shifts, the same shift every day but the days worked change. People on these shifts work five days a week but everyone takes turns working the weekends. These shifts schedules eliminate the bad effects of rotating and the bad effects of twelve hours, but workers loose many of their weekends off. With this arrangement, shift differentials and overtime pay for weekend work must be retained. Twelve-hour shifts improve communication (Baker, Heiler and Ferguson 2003), and increase morale and reduce absence through sickness (Smith et al. 1998).

2.3 LEGAL FRAMEWORK

Labour legislation requires increased attention since it tends to increase and to place greater burdens on organisations to comply. This is because exposure to particular typses and tasks of work remains a persitant problem and a continuing risk to worker's health and safety. Legislation is often enacted in such a way to give officials a right of entry and inspection to ensure that legal requirements are adhered to. In many developing countries, such legislation is often flouted. This may be due to apathy on behalf of the responsible body and maybe realising that such inspection is not in the best short-term interest of the nation, or related resource problems.

According to the Basic conditions of Employment Act, regulation of working time does not apply to:

- Senior managerial employees;
- Employees engaged as sales staff who travel to the premises of customers and who regulate their own hours of work;
- And employees who work less then 24 hours a month for an employer.

2.3.1 Regulation of working time

It is up to every employer to regulate the working time of each employee. Employers must do this in accordance with the provisions of any Act governing occupational health and safety. The health and safety of employees must be secured. The employees must regulate the working time with due regard to the Code of Good practice on the Regulation of Working Time issued under section 87 (1) (a) and with due regard to the family responsibility of employees.

2.3.2 Night work

Night work in the BCEA means work performed after 18h00 and before 06h00 the next day. The Act stipulates certain points out when it comes to night work.

Employees must be compensated by payment of shift allowance and transportation must be made available between employee's place of residence and the workplace at the beginning and end of the shift. The Act further requires

that in the event of night work on a regular basis, the employer to inform the employee in writing or verbally in a language that the employee can understand. The employee should know any healthy and safety hazards associated with the work and that it is the right of the employee to undergo medical examination in terms of paragraph (b) of this Act. The employer may transfer an employee to suitable day work if the employee suffers from a health condition caused by night work, if it is practically possible for the employer to do so. The regularity of work patterns should be designed in such a way that shift schedules are effective and productive.

2.4 IMPACT ON PRODUCTIVITY

Shiftwork contributes to increased absenteeism, especially among younger employees and those who have been doing shiftwork for only a short period. While older workers become tired more easily and less motivated, younger workers tend to experience higher rates of absenteeism. Employees who have been in the workplace longer are likely to have higher turnover.

According to previous studies conducted by Vernon et al, results showed that pauses of 10 minutes in the morning and afternoon could increase production by 5-12 percent.

The big question is how does one improve the productivity of a workforce? Increased productivity stems from an integrated approach to the management of human capital and the related risks with a focus on the health, wealth and happiness of employees. Previous studies conducted on absenteeism in South Africa confirms that it is reaching staggeringly high levels, and could be costing the country's economy as much as R12 billion per year. Most of the companies included in the study have some form of shift work.

Recent studies conducted on absenteeism by AIC Insurance shows very high results , and should therefore not be surprising if you consider all of the costs

associated with absenteeism, including both indirect and direct costs. Research conducted by Integrated Human Capital shows that in the average company approximately 4, 5 percent of the workforce is absent on any given day. In certain companies this figure is as high as 18 percent.

These kinds of figures represent considerable losses to any company and what is most disturbing is that it is not clear if most South African companies do nothing about this problem. In the absence of any evidence to address this problem can lead to the general assumption of a widespread acceptance that not much can be done about absenteeism, and in this case caused by shift work. Considering that absenteeism is on the increase, the great losses incurred by our companies and the fact that much can in fact be done to tackle the problem, we cannot afford the luxury of such views any longer.

According to the United States Chamber of Commerce's 2003 Employee Benefits Study as quoted by Skirwe (2004) absence-related costs amount to 12 percent of total compensation cost. Previous studies suggests that performance of night-shift staff is inferior to that of day-shift staff in most contexts where research has been conducted (Tilley *et al.,* 1982), more specifically, efficiency declines towards the end of a week on night shift, implying a progressive sleep deprivation (Vidacek *et al.,* 1986). Much of this research is conducted in manufacturing industries.

2.5 ATTITUDE TOWARDS THE JOB

Certain behavioral factors have been shown to be associated with shift work.
Previous studies demonstrate that smoking is more prevalent in shift than in day workers (Bøggild and Knutsson, 1999). Smoking can be seen as a medium of staying awake on the night shift. On the other hand, smoking might help the shiftworker to perform well during night work.

Therefore, the shift worker is less likely to be motivated to stop smoking. It is therefore evident that work hours have an impact on behavior.

Shiftwork affects employee health, family and social lives, personal and workplace relationships, and communication skills.
As stated in 2.4, older workers become tired more easily and less motivated.
Shiftwork, if not well-managed, results in occupational stress that leads to performance errors which are typically manifested in increased production rejects, reduced product quality and increased workplace accidents (Wedderburn 1996; Tepas, Paley and Popkin 1997; Smith and Wedderburn 1998; UE 2003). Shift workers may neglect rest and sleep in order to be with friends or families. The disruption to family and social lives and fatigue can result in job dissatisfaction (Wedderburn 1996; Baker, Fletcher and Dawson 2000; Caporale 2005).

2.6 IMPACT ON SOCIAL LIFE

The study also focuses on the impact on social life. In order to develop any current future views or studies on this, the researcher will make reference to previous studies on this matter. Previous studies have conducted studies on onshore and offshore shift workers. They compared the results and found that both onshore and offshore scored less favorable on questions concerning time spend with themselves and with their partners, family, friends, social relationship and children.
Working on Saturdays and Sundays can exclude the involvement in sporting events or religious activities. Shift work can thus lead to social marginalisation.
Permanent night nurses recorded more favourable responses than their rotating shift colleagues in respect of, good for family life, more friendly atmosphere at night, quickly over and more independent. Rotating shift nurses scored higher when rating night work, on gives me indigestion, tiring, disturbs my sleep, makes me irritable, restricts my social life, boring, lonely and upsets my appetite.

Shift work can be considered as a source of persistent fatigue, and cause difficulties in maintaining the usual relationships at both the family and the social levels. There are, however, consequent negative influences of shift work on worker's marital relations, care of children, social and family contacts (Wedderburn, 1967).

2.7 CONCLUSION

The pressing demands for higher volumes of production, from manufacturing industries have lead to the introduction of shiftwork in the early 1970's. The shift structure should be designed to not only benefit the business but also the very shiftworker responsible for delivering on such production demands. The legal framework of South Africa gives certain guidelines like payment for shiftwork, restperiods in between, and transport provisions for nightwork. These labour laws don't neseaarry prescribe the shift structure or pattern, as long if it remains within the legal framework dealt with in this chapter. The reason for shifts makes absolute sense but the challenge is to deal with problems associated with shiftwork.

The next chapter will focus on the impact of shiftwork on the employer.

CHAPTER 3

IMPACT OF SHIFTWORK ON EMPLOYEES

3.1 INTRODUCTION

The study will focus on previous work done on the impact of shift work on the employer's health, the impact on the family life and the Psychological Effects. Absenteeism can be a direct result of health problems associated to conditions of shiftwork. The study will specifically test this sub-problem in the questionnaire. Working shifts allow the employee to see his or her family between normal to abnormal hours. While the rest of the family sleeps, the shiftworker must work and the other way around. Disturbance to the biological clock or circadian rhythms can interfere with the sleep, digestion, body temperature and blood pressure.

3.2 THE IMPACT ON THE EMPLOYER'S HEALTH

3.2.1 Health

A shift worker, especially those who work during nights, must function on a schedule that is not natural. The constant changes can upset the circadian rhythm, also called the 24 hour body cycle, can cause sleep deprivation and disorders of the gastrointestinal and cardiovascular systems, and can make existing disorders worse. Scientific studies throughout the world have shown that shift work by its nature is a very major factor in the health and safety of workers.

Today, little to no evidence exists to show that shift work affects longevity (A˚ kerstedt et al., 2004). Studies conducted by Chronobiology International Vol. 21, No. 6, pp. 1049–1053, 2004 suggested that shift work is associated with increased mortality risk. Several previous studies have found higher rates of sickness absences in shift as compared to day workers (Ohayon et al., 2002; Morikawa et al., 2001,).

When rotating work shifts occurs, the body never gets used to working one time period. Researchers have compared current shift workers with day workers in the same work environment who have never worked shifts and have found shift workers to be significantly less healthy than day workers (Wallace 2003).

Shift work has potentially adverse effects on health, particularly on sleep.
Shift work is associated with a number of negative effects, including disturbed sleep and gastrointestinal disorders, but the increased risk of cardiovascular disease is a particular cause for concern (Knutsson, 2004,). The same studies revealed that with respect to variables representing sleepiness, nodding off at work was more common among the shift workers. This is in agreement with polysomnography studies of night workers (Lockley et al., 2004;).
Night and shift work causes workers to eat at different clock times than day workers (Pasqua and Moreno (2004), Waterhouse et al. (2003)). During night shift, an individual is likely to consume more than one meal or snack.

Food timing and frequency of meals, as well as the quantity of food ingested, also seem to be dependent on cultural and social factors and on habits established by each individual concerning the food he/she consumes, rather than on physiological aspects alone (Waterhouse et al., 2004).
According to Waterhouse et al. (2003) night workers have an altered food intake compared to day workers, evident by a strong snacking behavior during the nocturnal hours of work. Shift workers have an increased risk of developing health problems, some of which might be the consequence of poor eating habits (Holmback et al., 2002;). Circadian rhythm time-dependent differences in the postprandial responses to food intake may also be related to the risk of metabolic diseases in shift and night workers (Al-Naimi et al., 2004; Morgan et al., 2003).
Pairs of twins exposed to shift work reported somewhat deteriorated sleep quality and health problems after retirement (Ingre & A ° kerstedt, 2004). The more severe sleep problems are recognized in the diagnostic category, termed Shift

Work Sleep Disorder in the International Classification of Sleep Disorders (American Academy of Sleep Medicine, 2005).

An extensive body of research shows that shift work causes potentially adverse physical and emotional health effects (Costa, 2003; Knutsson, 2003, Knutsson et al., 2004). The detrimental effects of shift and night work are not experienced to the same degree by all workers, although a large percentage suffer sleep problems, fatigue, tiredness, performance decrements, and psychological disturbances, as well as cardiovascular and gastrointestinal complications, among others (Costa, 1996, 2003; Pati et al., 2001).

3.2.2 Safety

Safety can also be added to the health risk of the Shift Worker.

In many industrial situations, the priority risk is not constant across the day and night. With many industries, longer and safer runs are kept for the night shift. The work-pace may be slower, and there are often fewer workers present. This means that accident or injury rates often cannot be compared across the shifts, as fewer incidents might be expected on the night shift. In an unpublished study of injury rates in an engineering company, where the a priori risk of injuries appeared to be constant, it was discovered that substantially fewer injuries were reported on the night than day shift.

It was established that the clinic was closed at night, and first-aid cover was provided by the male security guards at the gatehouse situated at the distant entrance to the work site. It seems highly probable that this dissuaded many members of the work force from reporting less serious injuries on the night shift. Indeed, one nurse employed at the occupational health clinic also commented that the number of injuries reported during the day varied substantially depending on which nurse was on duty.

Increased automation and the decline of many heavy industries in industrialized countries has resulted in a change in the jobs of many shift workers, from a predominantly manual nature to a more supervisory one. In most instances, shift workers now control the machinery that performs the work, rather than performing the work itself. On the other hand, it may often also result in far greater potential safety or environmental consequences due to human error.

3.3 THE IMPACT ON FAMILY LIFE

The main role conflict a shift worker will experience is that between the roles of work and those of the family. Married employees with children are likely to be affected the most in terms of family life and marriage.
Research into work-life balance and stress has established that conflict between home and family leads to negative job related attitudes, including reduced job satisfaction, increased tardiness, absenteeism, sickness, turnover and reduced performance levels (Friedman and Greenhaus, 2000,).

Previous studies has shown that compared with people who work straight days, shiftworkers reported more interference to their family lives, especially the time available to spend with spouses and children. This fact is very important since the amount and quality of social interaction is related to physical and mental health. Individuals who cannot establish regular routines in their daily activities have difficulties planning for family responsibilities and coping with physical and mental fatigue as effectively as non-shiftworkers. It is difficult for the shift worker to participate in clubs, sports and other organised activities because they are too used to the normal day schedule.

Absenteeism, work accidents, fatigue and factors influencing health, disruption of social and family life, are certainly enhanced by local factors linked to low social support, in terms of lack of basic services and long and uncomfortable commuting hours (Prunier-Pulmaire and Gadbois 2000).

In a study conducted by Giovanni Costa, Associate Professor of Occupational Medicine in the Department of Medicine and Public Health at the University of Verona, Italy, shiftwork can act as a further stress factor or a trigger, as it matches conflicts between endogenous rhythms and social synchronizers with demanding working conditions and interferences in family and social life.

Shiftwork can be regarded as a double-edged sword in terms of its impacts on workers' family and social lives. Shiftwork which is based solely on organizational requirements and does not acknowledge the personal, domestic and social needs of its employees, may result in difficulties in scheduling childcare and attending school functions with children. It is therefore that normal family life, social life and community involvement will be disrupted (UE 2003). The different shift patterns of irregular work schedules are referred to as unsocial hours, which are linked to weekend work, evening and night work and morning shifts. Previous studies show that many shift workers suffer from additional stress caused by missing out on important parts of their social and family life and may not have sufficient time to recover from work in order to fulfill other needs (Baker et al. 2000). In some instances spouses may work completely different shifts, and creating a situation where couples who are employed spend less time together.

Unmarried shift workers miss out on the social life that most day workers have (UE 2003). The dislocation of family and social life may result in pressures on relationships, domestic work loads and community activities (Baker et al. 2000). Some studies have found that shiftwork can increase the time spent with family and friends and allows more time for other recreational pursuits (Caporale 2005). These studies has found that if one of the couple works regular hours, one can look after the children in the evening and overnight when the other one is working.

The same studies also found that shorter blocks of shifts, in particular fewer successive night shifts, increased blocks of free time and more weekends off, and increased leisure time are attractive alternatives to the normal shift schedule (Williamson and Mitchell 1997; NOHS 2005).

The most serious family disturbance is that many people who work evenings and nights are less able to spend time with their children especially small children who go to bed early. Further difficulties are experienced when the shift worker have to spend time with their spouses for the wife or husband who works during the day is often awake at the times when the shift worker must sleep. Spouses who then wish to spend time with their partners, who work shifts, have to alter their patterns of sleep, mealtime and recreation to accommodate the shift worker's schedule. The time that the shift worker spend with their families may prove less satisfying than it could be because the workers fatigue from sleep or lack of sleep can prevent normal social activity.

Many wives of shift workers have also reported being frightened staying home alone at night without a man available to protect them. The same studies also indicated that sexual activities are also sometimes disrupted by shift work.

3.4 THE PSYCHOLOGICAL EFFECTS

Shift working can be a potential psychosocial stressor. Results from previous studies showed that anxiety and depression indices also point to the likelihood of an adverse effect on mental health from shiftwork (Bu¨ltmann et el., 2001)

The question of whether shift work causes psychiatric mortality or shift workers have pre-existent psychiatric problems is not entirely resolved. The same study also indicated that there seems to be increased neuroticism with increasing years of shift work, but neuroticism in itself does not predict health related shift problems.

Most human physical functions follow a daily rhythm or a 24-hour cycle. These cycles are called circadian rhythms. The word circadian comes from the Latin

"circa dies" which means "about a day." Sleeping, waking, digestion, secretion of adrenalin, body temperature, blood pressure, pulse and other important aspects of body functions and human behaviour are regulated by this 24-hour cycle. These rhythmical processes are coordinated to allow for high activity during the day and low activity at night. Normally, the body uses cues from its processes and from the environment such as clock time, social activities, the light/dark cycle, and meal times to keep the various rhythms on track. An example is that the body temperature of a person is highest during the afternoon and early evening (6:00 p.m.) and lowest in the early morning (4:00 a.m. or just before sunrise). However, if the person is working at night, the body temperature does not have as much variation during a 24-hour period as it would normally.

The temperature rhythm and other body rhythms get out of sync and therefore these rhythms also get out of phase with the person's activity pattern. This disorientation can lead to feelings of fatigue and disorientation. These feelings are often described by a term "Jet lag". Some rhythms adapt in two to three days while others change only after longer periods.

People adapt to new schedules at different rates and so do the different rhythms. The total reversal of circadian rhythms may never occur because on off days, most people go back to a normal day schedule. Frequent changes in schedule and disruption to circadian rhythms can lead to chronic fatigue and other health problems.

3.5 CONCLUSION

This chapter has dealt with the impact of shift work on the employee' Health, Family Life and Psychological Effects. The research into previous studies has shown that shiftwork have potential effects on health, particular on sleep. The results from previous studies have revealed that conflict between home and family leads to negative job-related attitudes.

The studies further revealed that compared to people who work straight days, shiftworkers have more interference to their family lives. The results further show that working shifts does interfere with the biological clock of the human.

The next chapter will deal with the research design.

CHAPTER 4

THE HISTORY OF CADBURY

4.1 INTRODUCTION

The study will be conducted in the Port Elizabeth factory of Cadbury South Africa. This chapter will take a look at the history of Cadbury, its strategy, employment involvement, its values, and related operational points. The objective of this chapter is to give the reader enough insight into the place where the study is conducted.

4.2 BRIEF HISTORY OF CADBURY SOUTH AFRICA

Cadbury is the world's largest confectionery company. With origins stretching back almost 200 years today Cadbury products which includes brands such as Cadbury Trident, Halls, Green & Blacks. The Natural Confectionary Company, Crème Egg, Eclairs, Flake, Dentyne, Clorets, Hollywood, Stimorol and Bubbaloo are enjoyed in almost every country around the world.

Our Vision is to be the best biggest and the best confectionary company in the world.
Our core purpose is to create brands people love. Our chocolate, gum and candy brands are much loved favourites, bringing moments of pleasure to millions of people every day. We invent, make, market and sell delicious treats for people to eat and share. Our products are fun, and people smile, but we take the business of creating them very seriously.

4.2.1 A few facts and figures

- Three kinds of confectioneries are made and sell: chocolate, gum and candy
- Cadbury operates in over 60 countries
- John Cadbury opened for business in 1824 - making us nearly 200 years young
- The company works with around 35,000 direct and indirect suppliers

- Employs around 50,000 people across the globe
- Every day millions of people around the world enjoy our brands

4.1.2 Strategy

Cadbury believe that the business still has significant untapped potential – both in terms of top line growth and returns. By exploiting the strength of the leadership positions to continue to grow the market share and significantly increase the margins and returns, the aim is to achieve the vision of becoming the biggest and best confectionery company in the world.

The Vision into Action (VIA) plan for 2008 to 2011 aligns the energies and efforts of the teams around the world behind a number of priorities which will make the most impact on the revenue and margin performance.

In order to generate superior returns for the shareowners, the VIA will deliver six financial targets. These are set out in the financial performance scorecard below:

- Organic revenue growth of 4% - 6% every year
- Total confectionery share gain
- Mid-teens trading margins by 2011
- Strong dividend growth
- An efficient balance sheet Growth in Return on Invested Capital (ROIC)

To achieve these financial goals, Cadbury have a growth and efficiency strategy which aligns behind the focus on fewer, faster, bigger and better. This focus is being applied to all aspects of the business.

Cadbury currently is a very good place to be, to work and to supply the world with innovation and great products.

4.3 EMPLOYEE INVOLVEMENT

The most underutilised resource of many companies is the knowledge and skill of employees. This resource can be made a company objective and can become a benefit to the employees and the organization and also to the benefit of the customers of the company's products and services.

Among the many examples of approaches to achieve this objective are factory and office jobs designed to use employees minds as well as hands, production operations established for team manufacturing to permit flexibility and significant employee involvement in selecting the most efficient production procedure to fit situations as they develop, and electronic data processing and other devices which maximize the utilization of employee skill through the automation of routine support tasks.

The underlining principle of such approaches is that work becomes more challenging and interesting for employees as their knowledge and skills are improved and when they are increasingly able to influence decisions affecting their jobs. One of the most important of the different approaches is specific programs to enhance greatly employee participation in actions for improvement of operations. Many plants and companies have long recognized and emphasized the importance and value of widespread and genuine employee involvement as a basic characteristic of their operating practice.

The value and significance of such employee participation have been assisted by conceptual and theoretical developments of the social science, which have come to identify those patterns of human behaviour to foster both productive job contributions and human job satisfaction.

The industrial sociologist Eltom Mayo was among the pioneers who recognized that if industrial productivity is to be enhanced, many disintegrated social factors involved in the twentieth century industrialization would require far more effective employee involvement in plant actions than had earlier been the case. These behavioral science developments provide several contributions of successful foundations for fostering employee commitment to quality. One of the examples is the very powerful motivational principle of psychology, and that is the group of which the individual is a part that can be thought of as the ground of which the individual stands in an industrial organization.

As seen on the Cadbury website, there are ten principles of participation, Cadbury (2009).

These principles have emerged from the developments, both in companies and out of behavioral science. These principles are very important guidelines for the establishment of employee involvement programs that contribute to quality commitment in total quality control.

1. Successful employee involvement programs require genuine not superficial management involvement.
2. Employee contributions and ideas must receive serious consideration and be placed into operation whenever the recommendations are sound and relevant for the program to have real value.
3. A principle requirement and one of the real tests of effective programs is that they have long term continuity in contributing to plant and company operations.
4. Involvement programs are fully as important for office employees as for factory employees.

5. Program organization must be kept clear and simple. One of the great weaknesses of some involvement programs has been their over organization, with a superstructure which soon falls of its own weight.
6. As a corolly to 5, successful involvement programs require very careful initial preparation.
7. Involvement sessions, to be effective must be purposeful from the point of view of the participants.
8. The substance of the involvement sessions as well as the overall program itself must be kept fresh, relevant to current plant issues, and up to date.
9. The leadership of the involvement sessions should be from and orientated to line operations in the plant and company so as to assure direct operating participation, rather than only from staff.
10. Of the most vital importance, in the achievement of customer quality satisfaction, involvement programs are an important ingredient to, but not a substitute for the company wide and plant wide total quality control programs.

Experience clearly demonstrates that involvement programs will be genuinely meaningful only when they are developed within the plant and company total quality control program and established at the time in which they can be effective.

Different participative approaches to quality commitment

Three commonly used forms are:

- Quality circles
- Quality of working life
- Other key approaches

4.3.1 Quality circle

The quality circle is one of the most widespread forms of employee group participation.

It normally consist of a group of employees usually from one area of plant and company activity and usually small in number which meets periodically, often one hour per week. The purpose can include pinpointing, examining and analyzed and to solve problems, often of quality but also of production, safety, work relations, cost, plant housekeeping and others. The purpose is further to enhance the communication between employees and management, Cadbury (2009).

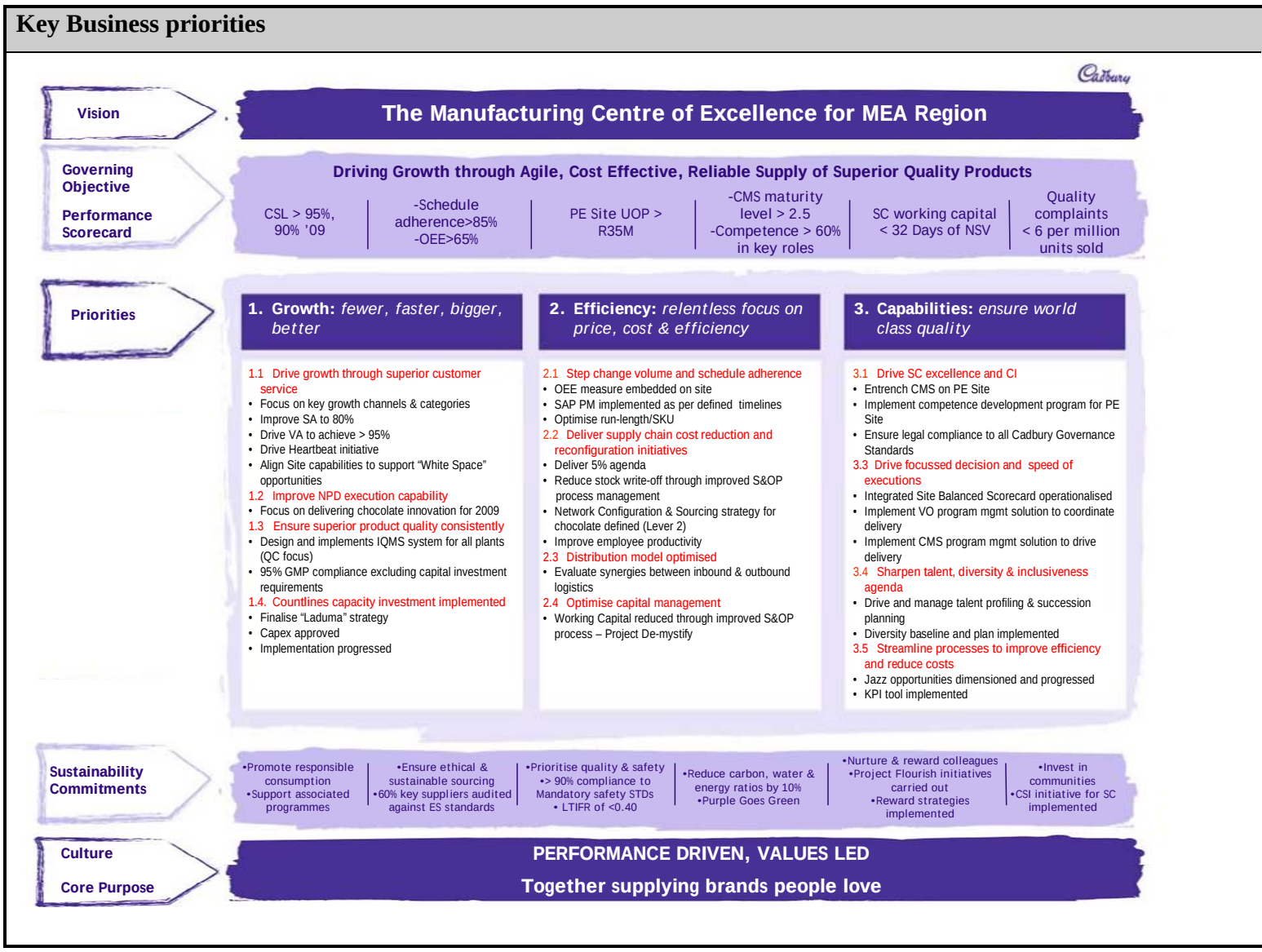
Each group will have an administrator and a facilitator. The facilitator makes sure that the relevant training is given to the group. The quality circle will be guided by a steering committee, which provides overall direction. A principle characteristic of quality circles is that they are normally structured to direct their attention to plant and company problems in an organized way.

4.3.2 Quality of working life

One of the more recent and widely recognized forms of program has itself come to be described as the quality of working life and is based upon the principle that a commitment to quality results most naturally where workers are closely involved in the decisions which directly affect their work. Some forms of QWL includes: workers may be called upon design their own assembly lines or work stations; production teams may be responsible for selecting and training new team members without direct management supervision. Whatever the specific activities, the QWL approach assumes the perspective of the individual worker as regards his or her skills, potential and feelings about the job, and promotes meaningful recognition for the worker as an individual, Cadbury (2009).

4.4 MANUFACTURING VIA AND 2009 OBJECTIVES

Figure 4.1 The Middle East and Africa Vision in Action



Source: http//www.cadbury.com

4.5 PORT ELIZABETH SITE OVERVIEW

Figure 4.2 Port Elizabeth Factory Overview

Site Overview

The site comprises various buildings ranging from old multilevel buildings, dating from 1938, to a modern single level Chocolate Crumb Making and Moulding facility built in 1997

Year Plant Built	1938
Floor space	37,744m²
Types of products	Moulded, Sugar, Countlines, Assortments, Industrial
No of lines	22
Total volume (2007)	31 810 tons (+19% vs 2006)
Headcount	1300

Cadbury South Africa 3

Source: Cadbury Induction Programme

4.6 SITE TECHNOLOGY

Table 4.1 Port Elizabeth Technology Diversity

PE Technology Diversity

PE is a multi-technology site and the most complex site in AME

Chocolate Technologies:

Chocolate Panning

Chocolate Moulding
- Solid & Inclusions
- Centre Filled (Shell)

One Shot Depositing

Chocolate Countlines
- Wafer
- Sheeter
- Flake
- Crunchie
- Sweetie Pie
- Assortment

Industrial
- Moulding
- Coatings
- Catering

Sugar Technologies:

Sugar Panning Chews

Feedstock Technologies:

Milk Powder
Crumb & Chocolate
Wafer sheet

Wrapping Technologies:

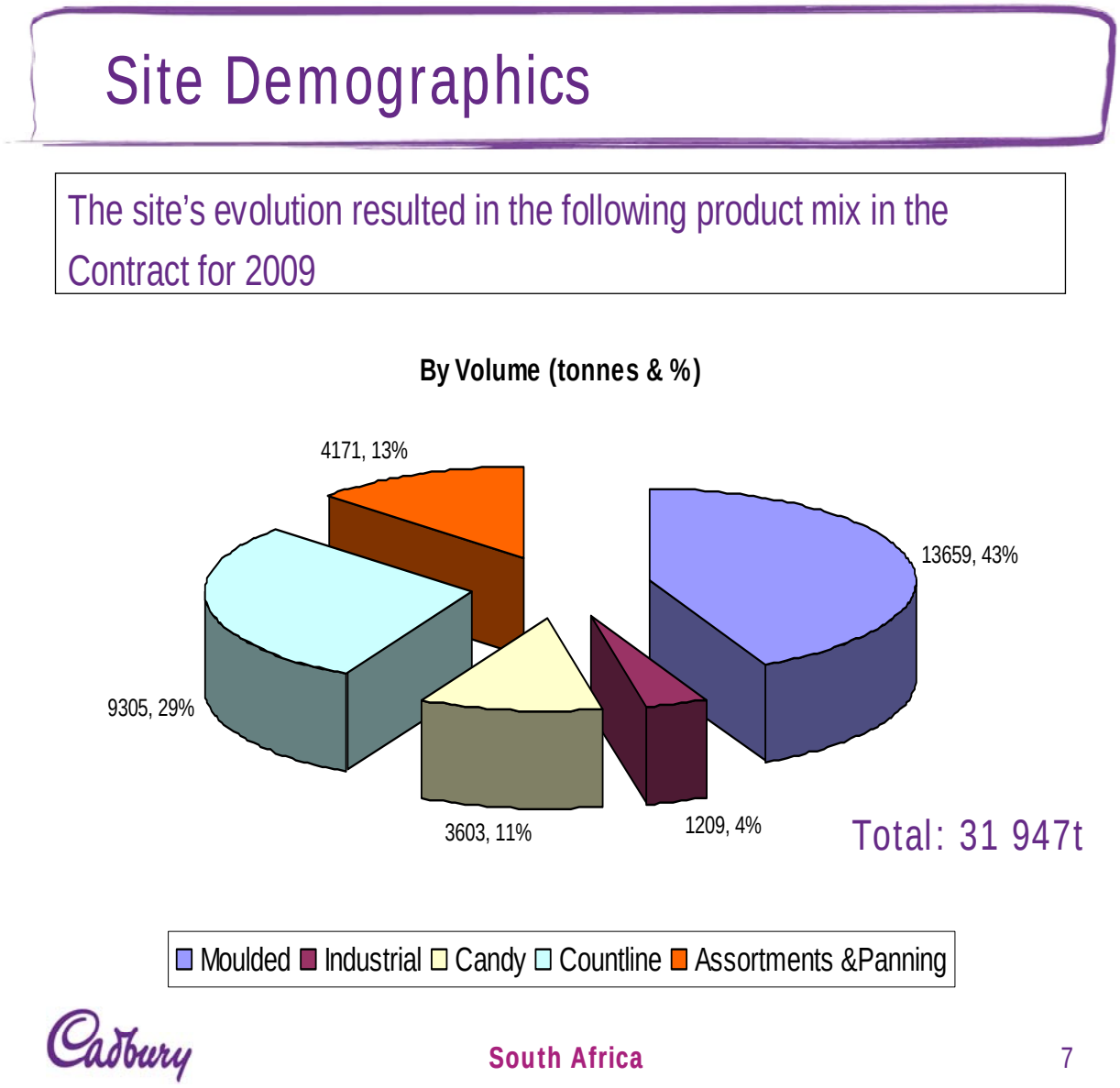
- Flow Wrap
- Pillow pack
- Bagging
- Bunchwrap

Cadbury South Africa 4

Source: Cadbury Induction Programme

4.7 SITE DEMOGRAPHICS

Figure: 4.3 Port Elizabeth Factory Demographics



Source: Port Elizabeth Contract Document, 2009

4.8 PEOPLE EMPLOYED BY CADBURY

Cadbury currently employs 288 seasonal workers of which 279 of them are hourly paid and nine are salaried. Also, 803 people are permanently employed of which 194 are salaried and 609 are hourly paid.

4.9 SHIFT SYSTEM

The factory is sub-divided into three
main factories. Based on operational requirements, each of these factories might run different shift patterns.

4.9.1 The Countlines factory runs the following shift patterns:

- Straight shift (06h00 till 15h30)
- 2 shift pattern (8hrs per shift, 06h00-14h00 and 14h00-22h00)
- 3 shift pattern (8hours per shift, 06h00-14h00, 14h00-22h00 and 22h00-06h00)

4.9.2 The Chocolate Making factory runs the following shifts:

- 3 shift pattern
- 4 shift pattern (6 days on and 2 days off, also 8 hour shifts)

4.9.3 The Candy and Assortments factory runs the following shifts:

- Straight shift pattern
- 2 shift pattern
- 3 shift pattern

It is important to note that all support functions are working the same shifts as per the production lines. Support functions can include quality, engineering and laboratory support. The shift patterns may vary as the demand increases or decreases. The temporally employed workers give the needed flexibility as seasonal workers. In the event of not having that flexibility, other alternatives may include short weeks when demand is very low.

4.10 MAIN FUNCTIONS

Cadbury is known world wide for its chocolate. Therefore, they focus on what they can do best and that is to make chocolate. The Cadbury chocolate has got a unique taste and is regarded as superior to its competitors. The business focuses on its core and outsources activities like services or utilities to external companies who specializes in managing utilities.

4.11 PRODUCTS

Cadbury produces about 132 different stock keeping units which include different sizes, and different products. The product sizes can vary from 15 grams to 300 grams. Section 4.5 outlines the different technologies with the possible products. Most of the products are for the local market and a very small percentage is for the export market.

4.12 OWNERS WORK

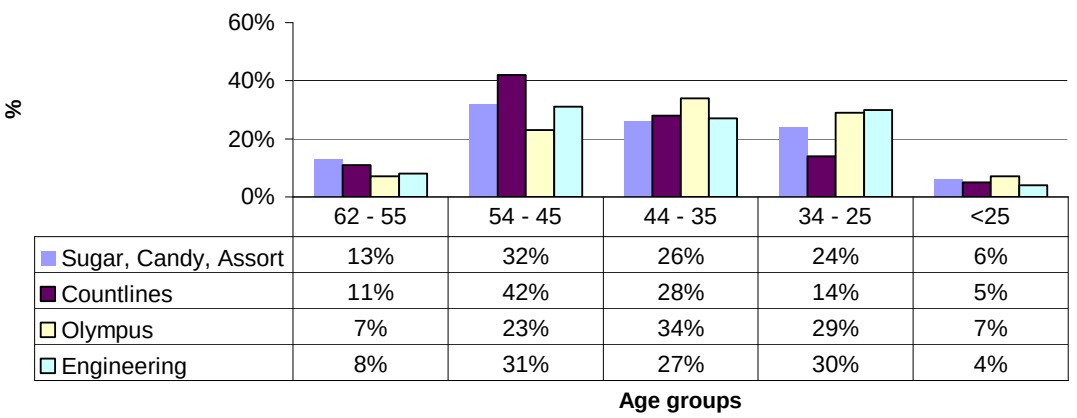
Different technologies require different interventions from people. Technologies ranges from very old equipment which is very labour intensive, to very high technology which requires very little manual interventions. Based on trade secrecy, the exact specific technologies will not be revealed. It is safe to indicate that most shift workers are exposed to medium to high labour intensive activities or work.

4.13 AGE PROFILE

The table below gives the reader a view of the different ages groups employed by Cadbury. It also indicate the areas where contingency plans need to be put in place to retain skills and knowledge. The age group 45 till 54 has the highest percentages and requires action plans to mitigate the impact of losing most of the people in this group when they retired all together. The Countlines factory has the biggest challenge with the highest percentage in this age group.

The Candy and Assortment factory has the biggest percentage in the last age group from 55 to 62.

Table 4.2 Cadbury Port Elizabeth Age Profile



	62 - 55	54 - 45	44 - 35	34 - 25	<25
Sugar, Candy, Assort	13%	32%	26%	24%	6%
Countlines	11%	42%	28%	14%	5%
Olympus	7%	23%	34%	29%	7%
Engineering	8%	31%	27%	30%	4%

Age groups

Source: Cadbury SA, Employment Equity Report to the department of Labour, 2008

4.14 WORKFORCE PROFILE AND CORE SUPPORT FUNCTIONS

4.14.1Workforce Profile

The following tables give the reader an overview of the total number of employees employed by Cadbury, including employees with disabilities, in each of the different occupational levels.

Note: A=Africans, C=Coloureds, I=Indians and W=Whites

Table 4.3 People employed by Cadbury PE in the different occupational levels

Occupational Levels	Male				Female				Foreign Nationals		Total
	A	C	I	W	A	C	I	W	Male	Female	
Top management				3				2	2	2	9
Senior management	1		1	17		1	1	8	1	1	31
Professionally qualified and experienced specialists and mid-management	10	11	8	40	11		3	21	2		106
Skilled technical and academically qualified workers, junior management, supervisors, foremen, and superintendents	51	44	13	61	24	23	9	44	1		270
Semi-skilled and discretionary decision making	345	108	4	5	134	324	8	35			963
Unskilled and defined decision making					4						4
TOTAL PERMANENT	407	163	26	126	173	348	21	110	6	3	1383
Temporary employees											
GRAND TOTAL	407	163	26	126	173	348	21	110	6	3	1383

Source: Cadbury SA, Employment Equity Report to the department of Labour, 2008

4.14.2 Core Operation Functions and Support Functions by Occupational Level

A job could either be a Core operation function or a Support function. Core operation Function positions are those that directly relate to the core business of an organisation and may lead to revenue generation e.g. sales production. Support Function positions provide infrastructure and other enabling conditions for revenue generation e.g. human resources corporate services.

Table 4.4 indicates the total number of employees, including people with disabilities, which are involved in Core Operation Function positions at each level in the organization. This table further offers the reader further insight to the Core Operation Functions.

Note: A=Africans, C=Coloureds, I=Indians and W=Whites.

Table 4.4 Core functions

Occupational Levels	Male				Female				Foreign Nationals		Total
	A	C	I	W	A	C	I	W	Male	Female	
Top management				3				1	1	1	6
Senior management	1		1	14		1		5	1	1	24
Professionally qualified and experienced specialists and mid-management	8	7	7	36	6		1	16	2		83
Skilled technical and academically qualified workers, junior management, supervisors, foremen, and superintendents	49	43	12	57	22	21	6	32	1		243
Semi-skilled and discretionary decision making	337	106	4	4	122	302	2	15			892
Unskilled and defined decision making											
TOTAL PERMANENT	395	156	24	114	150	324	9	69	5	2	1248
Temporary employees											
GRAND TOTAL	395	156	24	114	150	324	9	69	5	2	1248

Source: Cadbury SA, Employment Equity Report to the department of Labour, 2008

4.14.3 Support Functions

Table 4.5 includes the number of people employed in the Support Functions. Note: A=Africans, C=Coloureds, I=Indians and W=Whites

Table 4.5 Employees in Support Functions

Occupational Levels	Male				Female				Foreign Nationals		Total
	A	C	I	W	A	C	I	W	Male	Female	
Top management								1	1	1	3
Senior management				3			1	3			7
Professionally qualified and experienced specialists and mid-management	2	4	1	4	5	0	2	5			23
Skilled technical and academically qualified workers, junior management, supervisors, foremen, and superintendents	2	1	1	4	2	2	3	12			27
Semi-skilled and discretionary decision making	8	2		1	12	22	6	20			71
Unskilled and defined decision making					4						4
TOTAL PERMANENT	12	7	2	12	23	24	12	41	1	1	135
Temporary employees											
GRAND TOTAL	12	7	2	12	23	24	12	41	1	1	135

Source: Cadbury SA, Employment Equity Report to the department of Labour, 2008

4.15 PEOPLE CAPABILITY

Cadbury is very serious about the development of its employees. The following table indicates the various training within the different Occupational Levels.

Table 4.6 Total Employees trained in 2008

Occupational Levels	Male				Female				Total
	A	C	I	W	A	C	I	W	
Top management									
Senior management									
Professionally qualified and experienced specialists and mid-management	1			2	2			3	8
Skilled technical and academically qualified workers, junior management, supervisors, foremen, and superintendents	33	16	9	10	12	9		13	102
Semi-skilled and discretionary decision making	330	110	5	26	137	313	5	19	945
Unskilled and defined decision making									
TOTAL PERMANENT	364	126	14	38	151	322	5	35	1055
Temporary employees									
GRAND TOTAL	364	126	14	38	151	322	5	35	1055

Source: Cadbury SA, Employment Equity Report to the department of Labour, 2008

4.16 CONCLUSION

This chapter has dealt with the company where the researcher will conduct the study. The chapter also offered an in-depth insight into the workings of Cadbury Port Elizabeth as factors of success. The chapter started off with the history of Cadbury and specific details of the Port Elizabeth operations. This chapter offers the reader more then just stating where the research study will be conducted and amongst the global achievements, the challenges experienced related to shiftwork, and the prompted reason for this research study. The researcher is a member of the Cadbury Port Elizabeth leadership team.

The next chapter will deal with the research design.

CHAPTER 5

RESEARCH DESIGN

5.1 INTRODUCTION

According to Leedy and Ormrod (2001), “Research is a viable approach to a problem only when there is data to support it” (p. 94).

Research methodology, also known as the research paradigm, is the way you think about research, how you collect and analyses the data and the way in which you writes the dissertation. Two types of paradigms have been identified, namely the qualitative and quantitative paradigms.

Qualitative paradigm is concerned with qualities and non-numerical characteristics while a quantitative paradigm is all about data that is collected in a numerical form. A phenomenological paradigm tends to produce a qualitative data and a positivistic paradigm tends to produce a quantitative data (Collis & Hussey, 2003).

The main advantage of a quantitative approach to data collection is the relative ease and speed which the date can be collected. In this paradigm it is possible to use large samples while in a qualitative paradigm sample size may be small. For example a case study may consist of one respondent. A qualitative data collection method can be expensive and time consuming, although it can be argued that qualitative data provide a more real basis for interpretation and analysis.

The research project will follow a quantitative paradigm because of the nature of the problem statement which requires the researcher to measure the relationship between shift work, employee social life and productivity.

The framework for the empirical study was provided from chapter 2 till chapter 4. The focus of this chapter is on the research instruments which were central to the gathering of data for this study. It includes a discussion on the research concerning the measuring instruments, and the reasons for selecting a questionnaire as a quantitative instrument. The chapter also outlines how the sample was determined and how the questionnaires were distributed.

5.2 THE PURPOSE OF RESEARCH

The purpose of research can be summarised by many statements. According to Collis and Hussey (2003: 2), the purpose of research can be summarised by any combination of one or more of the following statements:

- “To review and synthesize existing knowledge”;
- “To investigate some existing situation or problem”;
- “To provide solutions to a problem”;
- “To explore and analyse more general issues”;
- “To construct or create a new procedure or system”;
- “To generate new knowledge”.

5.3 TYPES OF RESEARCH

According to Collis and Hussey (2003, 10), there are ten different types of research, which can be classified according to: Purpose, Process, Logic, and Outcome.

5.3.1 Purpose

The purpose of the research is why it is being conducted. The types of research classified according to purpose include the following: Exploratory, Descriptive, Analytical, and Predictive research (Collis and Hussey, 2003: 10 - 12).

5.3.1.1 Exploratory Research

This type of research is typically applied to solve problems when there are limited, or no previous studies available, which can provide information relevant to a particular issue or problem (Collis and Hussey, 2003: 10). Exploratory research is not used to prove or disprove hypotheses, nor is it used to provide conclusive answers to current issues or problems. Instead, its primary focus is on gaining insights and familiarity with the subject area for more rigorous investigation at a later stage, through the identification of patterns, ideas and hypotheses (Collis and Hussey, 2003: 10). The techniques used in exploratory research are flexible, and may include case studies, observation, and historical analysis (Collis and Hussey, 2003: 11). The data generated from these techniques is usually broad, and may consist of both qualitative and quantitative data (Collis and Hussey, 2003: 11). Exploratory research can also be used to determine whether or not any existing theories or concepts can be adapted and/or applied to the problem at hand, or whether or not, any new theories must be developed (Collis and Hussey, 2003: 11).

5.3.1.2 Descriptive Research

This type of research is typically associated with describing, identifying, and obtaining information related to the characteristics of different phenomena, issues or problems as they exist (Collis and Hussey, 2003: 11). In essence this type of research goes one step further than exploratory research as it is undertaken to provide answers to “what” is occurring, rather than just gaining insight into the occurrence (Collis and Hussey, 2003: 11). The data collected during this type of research is often, but not always, quantitative data, which are analysed and summarised using statistical techniques (Collis and Hussey, 2003: 11).

5.3.1.3 Analytical Research

Analytical research continues from descriptive research, and is often also referred to as explanatory research. This type of research is typically undertaken

to describe “Why” or “How” a particular phenomenon, problem, or issue is occurring (Collis and Hussey, 2003: 11). The primary focus for this research is concerned with the identification and controlling of critical variables related to the observed phenomena, in order to recognise, identify, and measure the causal relationships between these variables and the phenomena, so that the characteristics of the phenomena, problems, or issues can be better explained (Collis and Hussey, 2003: 11).

5.3.1.4 Predictive Research

The primary focus of predictive research is to anticipate the likelihood of a particular phenomenon, problem, or issue occurring in a different situation or context, based on specific critical variables and the causal relationships between these variables and specific phenomena, which most likely have been identified through previous analytical research (Collis and Hussey, 2003: 12). According to Collis and Hussey (2003: 12) “predictive research provides ‘How’, ‘Why’ and ‘Where’ answers to current events and also to similar events in the future”. They also claim that this particular research methodology is useful in providing answers to “What if?” or scenario planning type questions.

5.3.2 Process

The process essentially refers to the way in which the data is collected and analysed. The types of research classified according to the process are Quantitative and Qualitative research (Collis and Hussey, 2003: 10, 13).

5.3.2.1 Quantitative Research

In quantitative research, numerical data is collected through objectively measuring variables or particular aspects of a problem or issue. The data obtained from quantitative research is then analysed by applying statistical tests and techniques (Collis and Hussey, 2003: 13). According to Leedy and Ormrod

(2005: 94) quantitative research is most often used to “answer questions about relationships among measured variables with the purpose of explaining, predicting, and controlling phenomena”. This approach is also referred to as the “traditional”, “experimental”, or “positivist” approach (Leedy and Ormrod, 2005: 94).

5. 3.2.2 Qualitative Research

Qualitative research, as opposed to quantitative research, is more subjective in nature. It is mostly undertaken to describe, understand, examine, and reflect on perceptions relating to the nature of phenomena, and to gain insight into social and human activities, from the participant’s point of view (Collis and Hussey, 2003: 13; Leedy and Ormrod, 2005: 94).

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Leedy and Ormrod (2005: 133) claim that all qualitative approaches have the following two things in common:

- All qualitative approaches focus on phenomena, as they exist in a “natural setting”; and
- All qualitative approaches involve studying the phenomena in all their complexity.

According to Leedy and Ormrod (2005: 134 – 135) it is appropriate to use qualitative research for one or more of the following purposes:

- Description – to reveal the nature or characteristics of “certain situations, settings, processes, relationships, systems, or people”;

- Interpretation – to gain insights into particular phenomena, to develop new concepts or theoretical perspectives, and/or to identify problems that exist within phenomena;
- Verification – to test the validity of assumptions, claims, theories, or generalisations in real contexts;
- Evaluation – to determine the effectiveness of particular policies, practices, and innovations.

In the past qualitative studies have been frowned upon by the more scientific academic disciplines, because of their subjective nature. However, according to Leedy and Ormrod (2005: 133), this approach has most recently gained wide acceptance as legitimate academic research. The qualitative approach can also be referred to as the “interpretative”, “constructivist”, or “post-positivist” approach (Leedy and Ormrod, 2005: 94).

5.3.3 Logic

The logic of the research refers to whether the research being conducted, moves from the general to the specific, or vice versa. The types of research classified according to the logic are Deductive and Inductive research (Collis and Hussey, 2003: 10, 15).

5.3.3.1 Deductive Research

Deductive research is a type of research which moves from the general to the specific and one that is based on deductive logic (Collis and Hussey, 2003: 15).

When using deductive logic it is important to ensure that the premises on which the logic is based is sound, since a false or inaccurate premise may ultimately lead to false conclusions

5.3.3.2 Inductive Research

Inductive research is the reverse of deductive research, and tends to move from the specific to the more general (Collis and Hussey, 2003: 15). According to Leedy and Ormrod (2005: 32) inductive logic begins with an observation, rather than a pre-established general assumption. More generalised inferences are then induced from these particular observations (Collis and Hussey, 2003: 15).

5.3.4 Outcome

The outcome describes whether the research will solve a specific problem, or alternatively make a general contribution to existing knowledge. The types of research classified to the outcome are applied and basic research (Collis and Hussey, 2003: 10, 13 –15).

5.3.4.1 Basic Research

Basic research is also often referred to as fundamental or pure research, and is primarily conducted to improve the understanding of more general issues without the need for immediate application (Collis and Hussey, 2003: 13 –15).

5.3.4.2 Applied Research

Applied research is research that is designed to apply its findings to solving a specific and existing problem (Collis and Hussey, 2003: 13).

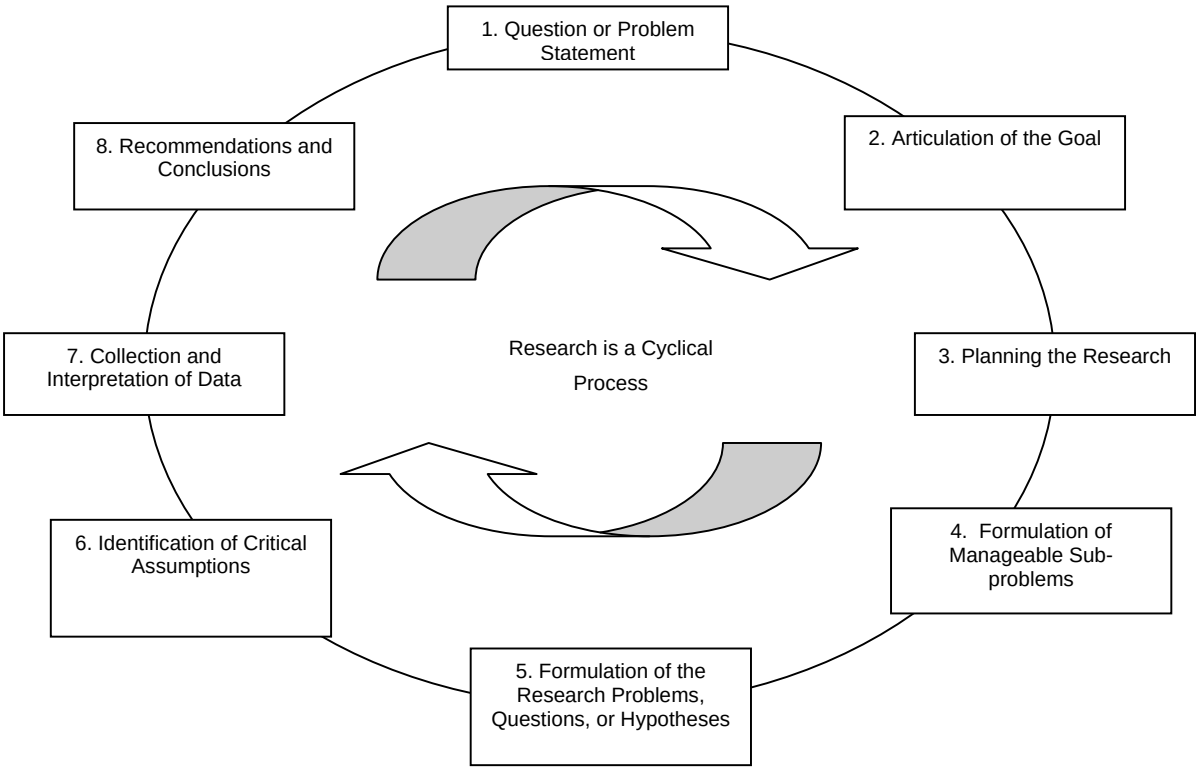
5.4 THE RESEARCH PROCESS

According to Leedy and Ormrod (2005: 3) the research process is cyclical, or rather it is helical. The research process starts when an answer, which is not readily available, is required to a question that has been posed (Leedy and Ormrod, 2005: 3).

It is important for the research to be effective, and Leedy and Ormrod (2005: 3) maintain that it is crucial that the ultimate goal of the research be articulated in a clear, unambiguous, precise, and grammatically correct statement.

The general process of conducting research is illustrated in Figure 5.1

Figure 5.1 The Research Process



Source: Adapted from the characteristics of research described by Leedy and Ormrod (2005: 2–6).

5.5 RESEARCH DESIGN

The research design is the general strategy that a researcher will follow to solve the research problem, in that it provides the overall structure for the chosen procedures (Leedy and Ormrod, 2005: 85).

The research will be conducted at Cadbury South Africa, its biggest factory in Port Elizabeth. This factory is responsible to service the rest of the country with the brands people love. To collect data for this investigation, a quantitative method will be used. The sample will be drawn from the manufacturing departments which will include operators, maintenance, quality and shift managers. A questionnaire will be used on this representative sample and semi-structured interviews will be conducted.

5.6 POPULATION AND SAMPLE SELECTION

The target population of this study comprised of shifts workers (operators, engineering, quality, and shift managers) of all races who have been with the company for more than 5 years. Anonymity and confidentiality will be strictly guaranteed. Follow-ups will be conducted to ensure a good response rate.

According to Scott and Morrison (2006:219) sampling refers to the activities involved in selecting a subset of persons or things from a larger population, also known as a sampling frame. Methods used to select the sample will determine the nature and validity of the findings that are generated form the study of that sample. According to Patten (2004), the quality of the sample affects the quality of the research generalisations. Nesbary (2000), suggests the larger the sample size, the greater the probability the sample will reflect the general population. However, sample size alone does not constitute the ability to generalize.
Patten (2004), states that obtaining an unbiased sample is the main criterion when evaluating the adequacy of a sample.

Patten also identifies an unbiased sample as one in which every member of a population has an equal opportunity of being selected in the sample. Therefore, random sampling was used in this study to help ensure an unbiased sample population.

The research is focusing on shiftworkers in the production department and to test the variables on them. Christensen (2001: 198) defines representative sampling as the sample where participants have the same characteristics as the people in the population.

For the purpose of the study, a sample of 100 shift workers will be drawn from the shift workers in the production department. Semi structured interviews will be conducted on the sample population. A structured questionnaire will be distributed to the about 100 shift workers currently employed by Cadbury South Africa.

5.7 METHODOLOGY

The research methods must be appropriate to the objectives of the study. The method used must answer these two main questions;

- How was the data collected or generated?
- How was it analyzed?

It assists the reader as to how the researcher obtained the results. It is important to know how the data was obtained because the method can affect the results.

The researcher wanted to find out from shiftworkers of the population their view on all the variables. Collis and Hussey (2003: 5 3) identifies a continuum comprising two main research paradigms, namely the positivistic paradigm which signifies quantitative research method and the phenomenological paradigm which signifies the qualitative method.

The positivistic approach attempts to explain social phenomena by establishing a relation between variables which are information converted into numbers. The phenomenological paradigm suggests that social reality lies within the unit of research, and that the act of investigating the reality has an effect on that reality.

5.7.1 Positivistic paradigm

Historically the positivistic paradigm (quantitative research) in the social sciences is based on the approach used in the natural sciences, such as biology, botany and physics. The positivistic approach seeks the facts or causes of social phenomena, with little regard to the subjective state of the individual. Thus logical reasoning is applied to the research so that precision, objectivity, and rigour replace hunches, experiences, and intuition as the means of investigating research problems. Positivism is founded on the same way as studies conducted in the natural sciences. It is based on the assumption that social reality is independent of us and exists regardless of whether we are aware of it (Collis & Hussey, 2003: 84).

Suter (1998:87) describes quantitative research as studies that test specific hypotheses, usually stated in advance, and that incorporate measures which can be analysed statistically. This type of research, the author states, uses tables or charts to display findings which can be generalised beyond the sample to a wider population. The researcher is distant in a sense, and guards against bias and other influences which may skew the results.

The primary characteristic of positivistic research is that it is a descriptive type of research where the goal is to attempt to provide an accurate description or picture of a particular situation or phenomenon. This approach attempts to identify variables that exist in a given situation and, at times to describe the relationship that exists between variables (Collis & Hussey, 2003: 86).

Wilkinson and Birmingham (2003: 45) state that the semi-structured interview allows the interviewer and participant more flexibility. The interviewer directs the interview more closely. More questions are pre-determined though there is sufficient flexibility to allow the participant an opportunity to shape the flow of information.

5.7.2 Design of the Questionnaires

The researcher may make use of four different types of questions to be included in the questionnaire, each with a purpose. Baker (1998: 173-174) list them as closed-ended questions, open-ended questions, contingency questions and matrix questions. Matrix questions can give the respondent the opportunity to answer sets of questions with similar questions. For the purposes of the study, structured questionnaires will be distributed to the hundred shiftworkers from the Cadbury Port Elizabeth factory. This forms part of the quantitative method of data collection.

Muijs (2004:45) points out that it is important for researchers to take heed not only of the way questionnaires are designed, but also of how questions are worded as these aspects will affect the answers participants give. The purpose of the questionnaire used in this research was to obtain information on whether shift work has an impact on productivity and the life of the shift worker.

The questionnaire comprises a four-point scale and the respondents were instructed during the administration of the questionnaires by the researcher to mark the most suitable answer. The scale ranges from 0 to 4 as follows:

1 Strongly disagree
2. Disagree
3. Agree
4. Strongly agree

The research questions can be seen from Annexure 1.

5.8 ETHICAL ISSUES

According to McNamara (1994), there are five ethical concerns to be considered when conducting survey research. These guidelines are listed as follows:

- To deal with voluntary participation,
- To cause no harm to respondents,
- Anonymity and confidentiality,
- To identify the purpose and the sponsor,
- The analysis and reporting.

5.8.1 Semi-structured Interviews

For the purposes of this study, semi-structured interviews will be conducted with the hundred shift workers from the Cadbury Port Elizabeth factory. This forms part of the quantitative method of data collection for this study.

Scott and Usher (2000:109) found that in a semi-structured interview, participants are encouraged to set the agenda of the interview, though the presence of an interviewer and other forms of control exerted by them means that the participant never has full control of the setting. The role of the interviewer is to set up the interview, to be involved in the negotiation of the venue, to formulate the purpose and agenda at the initial stages and asks questions, prompts answers and elicits reformulations of responses. The participants are then to provide the answers. Thus, gender, race, class and other types of power relations are conveyed by the researcher and form an essential backdrop to the answers that participants provide (Scott & Usher, 2000:109).

5.9 VALIDITY AND RELIABILITY

Two distinct aspects need to be considered under a quantitative research instrument namely validity and reliability.

5.9.1 Validity

An instrument is valid if it measures what it is intended to measure and accurately achieves the purpose for which it was designed (Patten, 2004; Wallen & Fraenkel, 2001).

According to Patten (2004), no test instrument is perfectly valid. Patten (2004) further identifies three principles to improve content validity namely;

- use a broad sample of content rather than a narrow one
- emphasize important material and to
- write questions to measure the appropriate skill.

Validity is a measure of the how well the research design captures the variable under inquiry. Thinking back to how variables are operationalised, validity then concerns the degree to which the variables in question purport to measure a given phenomenon (Feng, 2006: 12).

5.9.2 Reliability

Reliability is a measure of the repeatability and stability. With the question of reliability, the concern is whether the results will be consistent under similar conditions (Feng, 2006: 12). Hollaway and Jefferson (2000: 79) further state that reliability refers to the consistency and repeatability of results.

Denscombe (2002: 101) states that reliability relates to the methods of data collection and the concern that they should be consistent and not distort the findings. Generally it entails an evaluation of the methods and techniques used to collect data. It refers to the ability of a research process to provide results that do not vary from occasion to occasion and that do not vary according to the particular undertaking the research.

The study used semi-structured interviews to support the reliability of the study.

5.10 CONCLUSION

In this chapter, the researcher has sets out the process of research with its methods for data collection and enquiry. A quantitative approach was used to test the variables of shiftwork.

In the following chapter, the results obtained from the questionnaire are presented and discussed to determine the extent to which respondents agree or disagree about the impact of shiftwork on the employee.

CHAPTER 6

DATA ANALYSIS AND INTERPRETATION

6.1 INTRODUCTION

In the previous chapter the researcher discussed and outlined the methodology followed within this research study. The goals of the research objectives were presented. The chapter also discussed the research population and sample; the respective reliability and validity of the methodology; the process of data collection, capturing and analysis. This chapter presents and discusses the results of the correlation analysis of the research and the assessment of the reliability of the research data.

Denzin and Lincoln (2003:9-11) states that qualitative research, as a set of interpretive activities, privileges no single methodological practice over another. They further explain that qualitative research, as a set of practices, embraces within its own multiple disciplinary histories, constant tensions and contradictions over the project itself, including its methods and the forms its findings and interpretations take.

The data collection for this study took place in October 2009 and was carried out by the researcher. The management of Cadbury SA has welcomed the research for it might ultimately benefit the business. The research was done with no disruptions of any department or facility.

A total of 100 questionnaires were given out to shift workers representing all functions in the manufacturing department. Questions related to attitude towards the work, family life, social life, productivity, physical health, psychological effects and shift work are responsible for the final outcomes of the study.

This chapter will focus on the interpretation and analysis of the data for this study.

6.2 RESPONSE TO THE QUESTIONAIRE

A total of 100 questionnaires have been distributed to shiftworkers in the Port Elizabeth factory of Cadbury South Africa. Respondents ranges from production operators, shift managers and support functions which include engineering and quality. Only 63 questionnaires has been completed and returned to the researcher. The response rate is lower then what the researcher has expected and can be regarded as a disappointing response rate, which is 63 percent.

Although the production operators are the majority of the total shiftworkers in Cadbury, the researcher wanted to determine the impact of shiftwork across all functions, which include junior management. The questionnaire consisted of subsections and as follows:

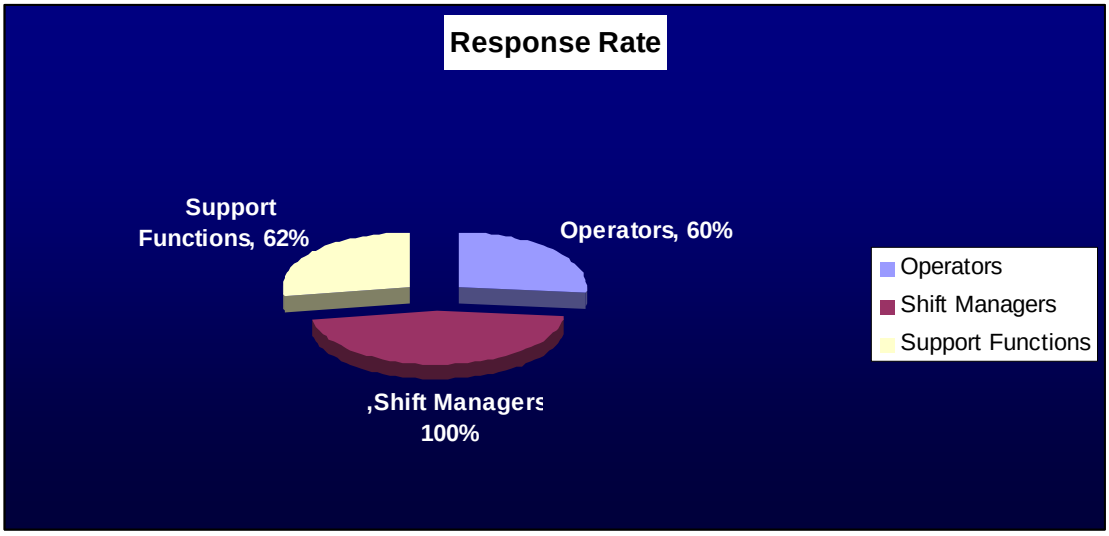
- Question one to question five deals with Attitude towards the work
- Question six to question ten deals with Family Life,
- Question 11 to question 15 deals with Social Life,
- Question 16 to question 20 deals with Productivity,
- Question 21 to question 25 deals with Physical health,
- Question 26 to question 30 deals with Psychological Effects, and
- Question 31 to question 34 deals with Shiftwork.

As shown in Table 6.1, a total of 100 questionnaires were handed out to a sample of Cadbury South Africa shift workers, including operators, shift managers and support functions. Only 63 questionnaires were returned by the participants who represent a response rate of 63 percent. The response rate is reflected in Table 6.1. Also see table 6.1 for the response rate.

Table 6.1 Response rates from the structured questionnaire

	OPERATORS	SHIFT MANAGERS	SUPPORT FUNCTIONS	TOTAL
Population	869	45	86	1000
Sample	86	6	8	100
Responses	52	6	5	60
% returned	60%	100%	62%	63%

Fig 6.1 Response rates from the structured questionnaire



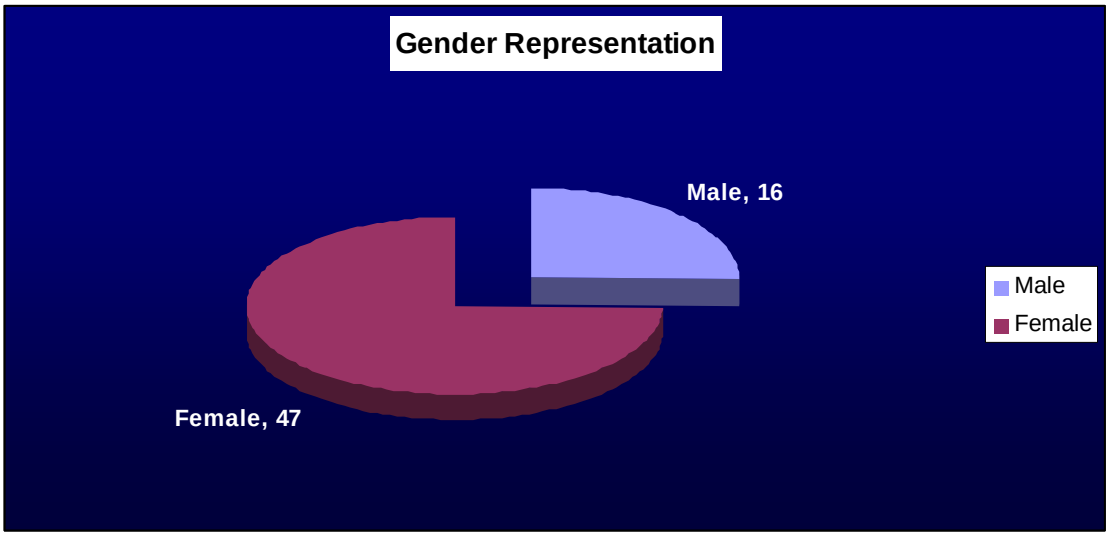
6.3 DEMOGRAFIC DATA

Statistics from the study revealed that 75 percent of the participants were female and 25 percent were males. Table 6.2 shows the gender representation of the study. The gender representation is also demonstrated in figure 6.2.

Table 6.2 Gender Representation

GENDER		
	Responses	Percentage
Sample	63	
Male	16	25 %
Female	47	75 %

Figure 6.2 Gender Representation



6.4 ANALYSING AND INTERPRETING THE DATA

According to Schoenbach, (2004: 461), there are several major objectives to be considered when analyzing data for research. The following includes such objectives:

- Evaluate and enhance the data quality

- Describe the study population and its relationship to some presumed source
- Assess potential for bias for example; no-response, refusal, attrition and comparison groups.
- Estimate measures of frequency and extent like prevalence, incidence, means, and medians.
- Estimate the measures of strength of association or effect
- Assess the degree of uncertainty from random noise
- Control and examine effects of other relevant factors
- Seek further insight into the relationships observed or not observed
- Evaluate impact or importance

6.4.1 Analysis of the questionnaire

In this study, tables and pie-charts were used. The study will analyze the data to test the hypothesis, and will deal with each hypothesis on its own.

The researcher will now present the data analysis of this research.

6.5 DATA ANALYSIS

Once data were collected, it was necessary to employ statistical techniques to analyse the information, as this study is quantitative in nature.

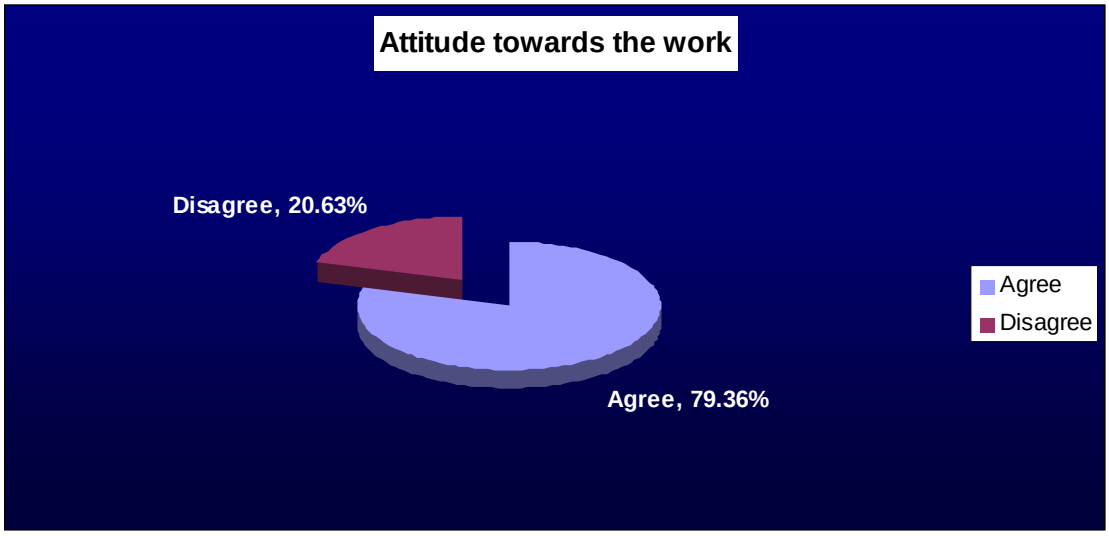
6.5.1 The impact of shiftwork on the Attitude of employees towards their work

Table 6.3 reflects the responses of participants with regard to the questions asked about their attitude towards their work. Overall 20.63 percent of the respondents in this category feel that shiftwork does not impact their attitude towards their work. 79.36 percent of all the participants in this category feel that shiftwork do impact their attitude towards their work.

Table 6.3 Attitude towards the work

Strongly Disagree	Disagree	Agree	Strongly Agree
4.76	15.87	46.03	33.33
20.63 %		79.36%	

Figure 6.3 Attitude towards the work



6.5.2 The Impact of shiftwork on Family Life

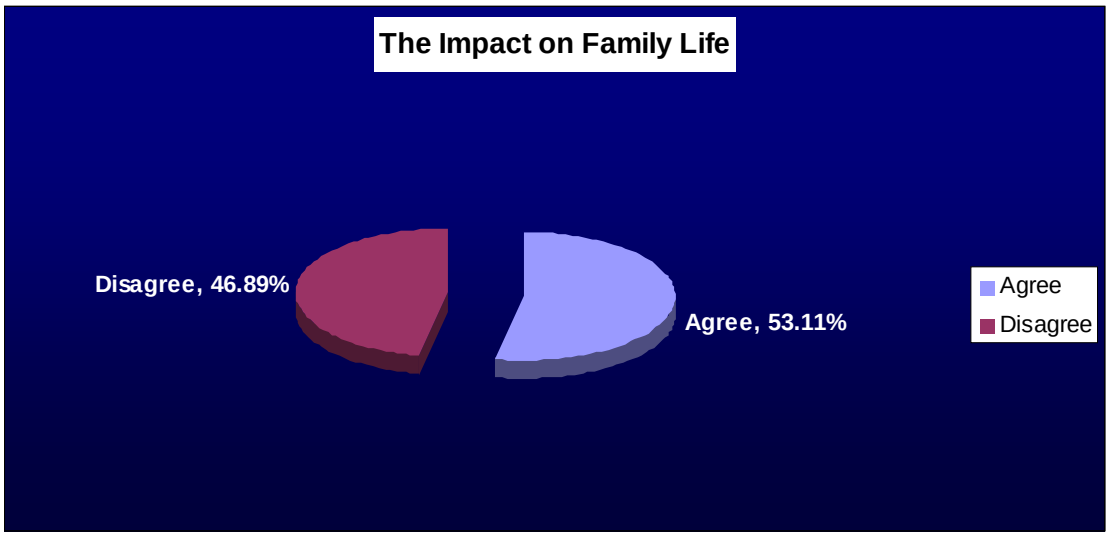
The statistics from the study shows that 46.89 percent of the respondents in this category disagrees that shiftwork impacts their family life. On the other hand, the study shows that 53.11 percent of the respondents feel that shiftwork does impact their family lives. Table 6.4 below indicates the feedback on this category, which deals with the impact of shiftwork on family life.

Table 6.4 The impact on family life

Strongly Disagree	Disagree	Agree	Strongly Agree
14.1	32.79	40	13.11
46.89 %		53.11 %	

Figure 6.4 below further demonstrates the responses on the impact of shiftwork on family life.

Figure 6.4 The impact on Family Life.



6.5.3 The Impact of shiftwork on Social Life

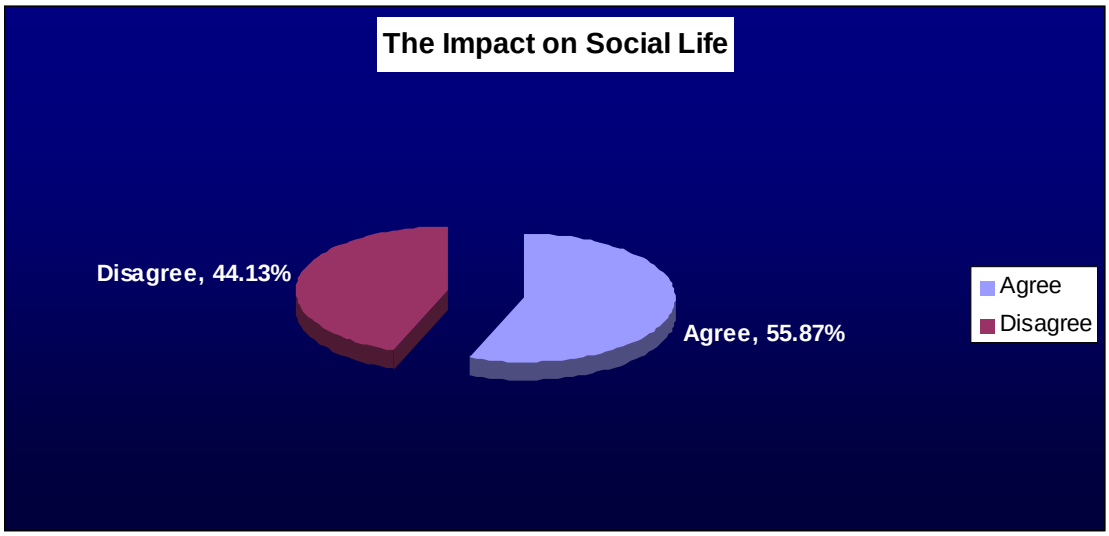
The study revealed that 44.13 percent of the respondents in this category disagrees that shiftwork has an impact on their Social Life. 55.87 percent of the respondents do feel that shiftwork do have a impact on their social life. Table 6.5 below indicates the results of the study in this category.

Table 6.5 The Impact of shitwork on Social Life

Strongly Disagree	Disagree	Agree	Strongly Agree
15.56	28.57	45.71	10.16
44.13 %		55.87 %	

Figure 6.5 below is also an illustration of the impact of shiftwork on the Social Life of employees.

Figure 6.5 The Impact of shiftwork on Social Life



6.5.4 The impact of shiftwork on Productivity

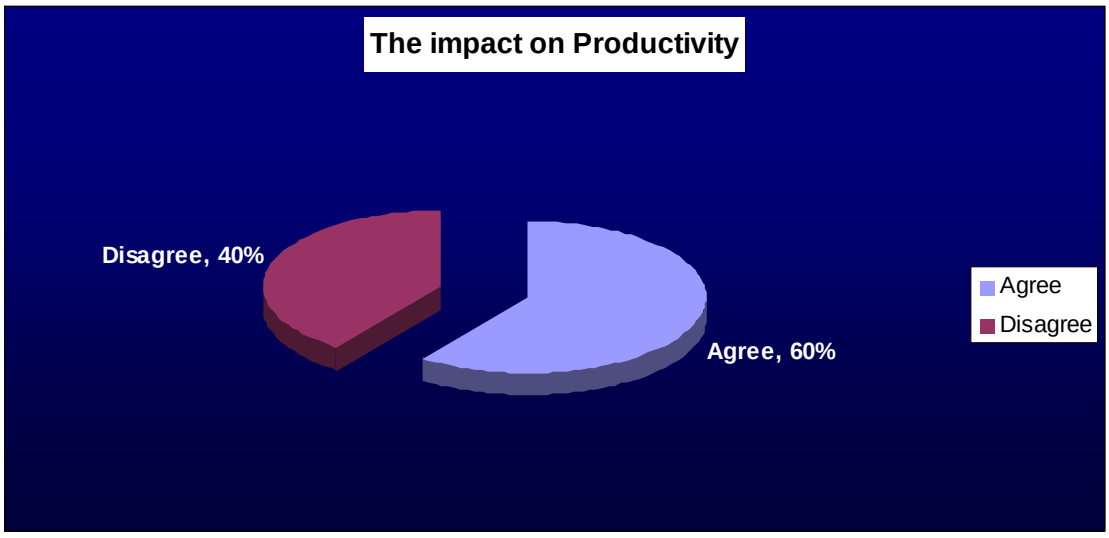
The study reveals that 40 percent of the respondents in this category do not believe that shiftwork have an impact on their productivity. However, 60 percent of the respondents do belief that shiftwork have an impact on their productivity. Table 6.6 below indicates the responses in this category.

Table 6.6 The impact of shiftwork on Productivity

Strongly Disagree	Disagree	Agree	Strongly Agree
19.05	20.95	36.83	23.17
40 %		60 %	

Figure 6.6 below also indicates the responses in this category.

Figure 6.6 The impact of shiftwork on Productivity



6.5.5 The impact of shiftwork on the Physical Health of the shiftworker

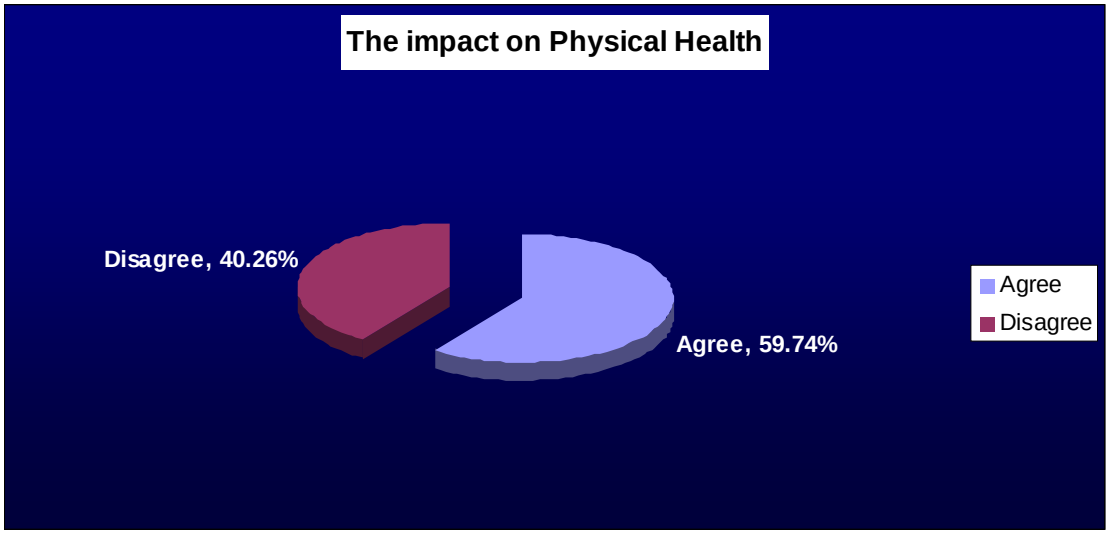
The statistics from the study reveals that 40.26 percent of the respondents in this category disagree that shiftwork have an impact on their physical health. 59.74 percent of the respondents, however, feels that shiftwork do affect their Physical Health. Table 6.7 below illustrates the impact on Physical Health.

Table 6.7 The impact of shiftwork on Physical Health

Strongly Disagree	Disagree	Agree	Strongly Agree
12.66	27.6	43.83	15.91
40.26 %		59.74 %	

Figure 6.7 below also illustrates the the impact of shiftwork on the Physical Health of the shiftworker.

Figure 6.7 The impact of shiftwork on Physical Health



6.5.6 The Psychological Effects on shiftworkers due to shiftwork

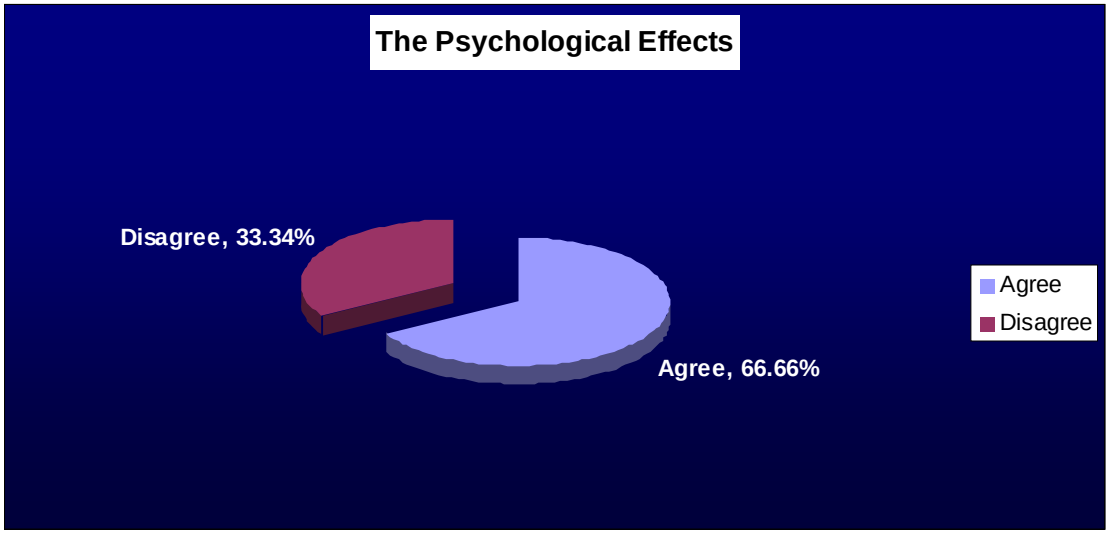
One third of the respondents feel that shiftwork causes no Psychological Effects on them. Two thirds of the respondents do agree that shiftwork have a Psychological Effect on them. Table 6.8 below illustrates the Psychological Effects on shiftworkers due to shiftwork.

Table 6.8 The Psychological Effect on shiftworkers

Strongly Disagree	Disagree	Agree	Strongly Agree
6.54	26.8	50.98	15.68
33.34 %		66.66 %	

Figure 6.8 also illustrates the Psychological Effects on shiftworkers due to shiftwork.

Figure 6.8 The Psychological Effects on the shiftworker



6.5.7 Shift Work

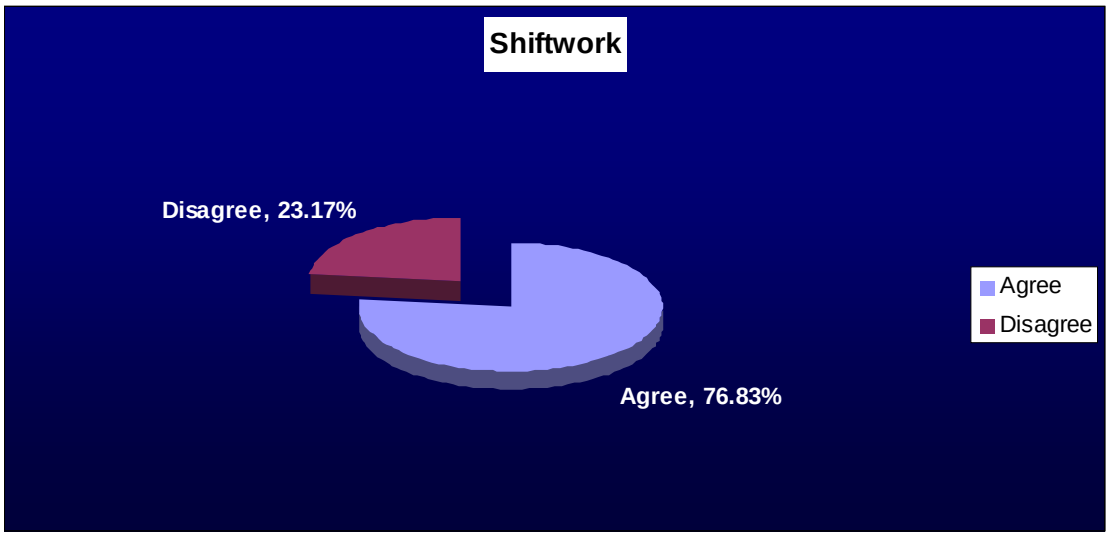
The statistics of this study has revealed that 23.17 percent of the respondents are shiftworkers but necessary work nightshift, work weekends or work on a rotating shift pattern. The study also reveals that 76.83 of the respondents are shiftworkers and do work night shifts, their shifts do include weekends and their shift pattern is based on rotating shift pattern. Table 6.9 below illustrates the feedback on shift work.

Table 6.9 Shift Work

Strongly Disagree	Disagree	Agree	Strongly Agree
6.5	16.67	53.66	23.17
23.17 %		76.83 %	

Figure 6.9 below also illustrates Shift Work.

Figure 6.9 Shift Work



6.6 CONCLUSION

In this chapter, the statistical analysis and interpretation of the results from the empirical study were presented and discussed. The quantitative research findings were summarised, integrated and reflected upon.

The overall feedback from the study reveals that shiftwork do have a negative impact on shiftworkers. This result is evident in all the categories tested in this study.

The study then confirms that shiftwork do have an impact on the:

- The attitude towards the work,
- The family life,
- The social life,
- Productivity,
- Physical health of the shiftworker and having
- Psychological effects on the shiftworker.

In chapter seven the conclusions and recommendations, based on the findings of the empirical study will be presented and discussed.

CHAPTER 7

RESULTS, RECOMMENDATIONS AND CONCLUSIONS

7.1 INTRODUCTION

The purpose of this chapter is to present a summarised report of this study with specific reference to the extent to which the main problem and its associated sub problems has been addressed. The constraints and the challenges of the study are indicated and final conclusions drawn. Recommendations are presented and future research related to this topic is suggested.

7.2 SUMMARY OF THE STUDY

For the purpose of drawing all the components of this study together, the main problem and the sub-problems are re-stated in order to present the actions that had been taken in respect of each.

The main problem in this study was presented as:

The impact of shift work on productivity.

The purpose of this study was to conduct a literature study on the impact of shiftwork on productivity. On the other hand, it entailed an empirical study to assess respondents' perceptions with regards to the impact of shiftwork on various aspects of the life of the shiftworker.

In analysing the main problem, the following six sub-problems were identified:

Sub-problem 1

Does shiftwork affect the shiftworker's attitude towards the work?

This sub-problem was addressed in chapter two by means of a literature study. The empirical study conducted suggested that shiftwork do have a collective impact on the worker's attitude towards the work.

Sub-problem 2

Does shiftwork have an impact on the family life of the worker in the Cadbury Port Elizabeth factory?

This sub –problem was addressed in chapter two by means of a literature study. The empirical study conducted suggested that shiftwork do affect the family life of the shiftworker.

Sub-problem 3

Does shiftwork affect the social life of the shiftworker? This sub-problem was addressed in chapter two by means of a literature study. The literature study revealed that rotating shiftworkers had more social issues than permanent night workers.

Sub-problem 4

Does shiftwork affect the productivity of the shiftworker? This sub-problem was addressed by means of a literature study. The literature study revealed that productivity reduces during night shifts and normally towards the end of the week.

Sub-problem 5

Does shiftwork affect the physical health of the shiftworker? The literature study revealed that shift workers are less healthier then day workers in the same environment.

This sub-problem was addressed by means of an empirical study with a questionnaire as the data collecting tool.

Sub-problem 6

Does shiftwork have psychological effects on the shiftworker? This sub-problem was addressed in chapter three by means of a literature study. The literature review revealed that frequent changes in schedule and disruption to circadian rhythms can lead to chronic fatigue and other health problems.

7.3 RESULTS

The majority of the respondents indicated that shiftwork do affect their lives based on the six sub-problems used in the questionnaire.

The following conclusions were reached based on the results of the empirical study in Chapter 6:

- The majority of the respondents indicated that shiftwork affects their attitude towards the work. Examples, though not tested for in this study by the researcher, can be smoking during night-shifts to keep them "occupied", skipping of certain requirements of the job.
- The majority of the respondents indicated that shiftwork affects their family life. The results of this sub-problem were very close, in fact the closest of all the sub-problems. 46.89 of the respondents disagree and 53.11 indicated that shiftwok does affect their family life.
- The majority of the respondents indicated that shiftwork affect their social life.
- The majority of the respondents agree that shiftwork affect their productivity. The researcher has experienced first hand the impact of shiftwork on productivity as a shift-manager three years ago. Those experiences revealed a decrease in productivity in the first day of every new shift-cycle and the last day of the same cycle.
- The majority of the respondents indicated that their physical health deteriorate because of shiftwork. This can be concerning for any business with a continuous operation. It mostly will lead to increased absenteeism, and further more increase cost of production.
- The majority of the respondents indicated that they do develop psychological effects because of shiftwork.

The results from the study can be very helpful for the researcher as a senior manager of the Cadbury Port Elizabeth factory. This will enable the employer to approach and handle shiftwork-related behaviours differently.

Observations and learnings by the researcher has shown that as much as shiftwork have “negative” effects on shiftworkers, they enjoy the associated benefits like shift allowances, and overtime. The opinion of the researcher is that the shiftworkers would be more “unhappy” should shiftwork be completely discontinued.

7.4 RECOMMENDATIONS

Research is a process that results in the generation of scientific knowledge by means of various objective methods and procedures (Welman & Kruger, 2005, p2). De Vos, et al., (2002, p50) also consider problem-solving to be one of the key outcomes of the research process. The objective of this study was to analyse the impact of shiftwork on productivity in the Cadbury Port Elizabeth factory.

The following recommendations emerged from the literature as well as the empirical study:

- The first recommendation to Cadbury Port Elizabeth would be to conduct feedback sessions with shiftworkers to better understand the challenges they are facing as shiftworkers. It can be called climate surveys for shiftworkers. The results, together with the results of this study can be used to develop assistance programmes for the affected employees.
- Cadbury should review all shift patterns, compare it with similar or the same industries and share learnings and knowledge of best working shift patterns. Learnings from other industries can include shiftworker’s perceptions of different shift patterns. The hours per shift should be carefully selected between eight hours and twelve hours.
- Facilities should be considered for night shift workers who’s attitude towards their work is affected, to engage with their families at least once per night work in the form of a phone call. It will cost some money, and would require proper controls, but the results can be tested and might improve morale, and change the behaviour.

- The time office should alert when an employee is working continually excessive overtime and spend less time with the family. This can assist those whose family life is affected by shiftwork.
- Cadbury should consider having work-related functions like carnavals, sport days and family days where shiftworkers can be encourage to bring their families with. This will assist those shiftworkers whose social lives are affected by shiftwork. This will assist to create a balance in the shiftworker's life.
- Absenteeism is normally one of the biggest contributors of decrease in productivity. Regular health checks, at least every three months can be conducted. Currently, this is an annual event and the frequency can be increased. This too will cost money, but it should be compared to the current losses due to low productivity levels and increased production cost due to absenteeism. These health days can include massages, and basic medical checks like blood pressure and cholesterol.

7.5 PROBLEMS AND LIMITATIONS

The administration of the questionnaire yielded an unsatisfactory response in that Only 63 of the 100 questionnaires were completed and returned to the researcher. Although not tested, the opinion of the researcher is that it might be difficult for the operator shiftworkers to still do their work and completing the questionnaire. The further opinion of the researcher is that the operators were not interested to complete the questionnaire after hours at home. Some questionnaires had been completed after prompts from the researcher.

7.5.1 The sampling

No limitations were experienced during the questionnaire in terms of access to the factory and conducting the questionnaires. The research questionnaire was issued to respondents from managerial, employee and support function ranks by means of a convenience random sampling method.

The same approach applied to the employee respondents. The research sample can be considered as being representative of the shiftwork population.

7.6 OPPORTUNITIES FOR FURTHER STUDIES

The research is not a full or complete representation of the Cadbury South Africa factory. The results from a much broader study might differ to this study conducted by the researcher. Future studies can be introduced to other Cadbury factories and the results can be compared to the Port Elizabeth findings. This study has not exhausted all shifts –related problems, and the researcher believes that future studies can test the recommendations made in this study and compare the then results with the current. The opinion of the researcher is that valuable lessons can be learned and probably published as learnings for industries with a continuous demand process, requiring shiftwork.

7.7 CONCLUSIONS

Most businesses do not understand the real impact of shift-related problems on their business. It often leads to productivity problems and the real cost of productivity losses are often not determined or calculated. In the absence of any proper information, in this case research studies, managers are unable to properly deal with matters arising from shiftwork. As economic pressure increases, and businesses are forced to be more competitive, the impacts that shiftwork have on the employee and the employer as revealed in this study, can be very challenging for any business.

The shift-related impacts will not vanish automatically and without any intervention from the employer, in this case Cadbury Port Elizabeth, improvement in productivity will not happy. It remains the choice of the employer to embark on the recommendations, depending where the business see themselves. Current productivity levels might be skew due to increased overtime to deliver on production plans.

In most cases, not all “extra” hours worked are included in the productivity calculations. In most cases large organisations evolve and increase in size and fail to invest in matters sees as not important. The researcher is of the opinion that the findings of this study can assist the company with problems related to shift work.

ANNEXURE 1

PROPOSED MEASURING INSTRUMENTS

The questionnaire comprises a 4 point scale and the respondents will be instructed during the administration of the questionnaires by the researcher to mark the most suitable answer. The scale ranges from 0 to 4 as follows:

1. Strongly agree
2. Agree
3. Strongly disagree
4. Disagree

This method is also known as the Likert scale.

1. Attitude towards work
    a. As a shift worker, I have a positive attitude towards my job
    b. I do contribute towards good performance of my shift
    c. I do have control over work periods
    d. As a shift worker, I can still work overtime as well
    e. I have no problem working abnormal hours

2. Family Life
    a. I can still manage my family as a shift worker
    b. My husband/wife have no real problems with me working shifts or abnormal hours
    c. My children don't complaint about never seeing me
    d. I have not seen any deteriorating of my children's discipline
    e. I have enough time to attend to my family matters as a shift worker

3. Social life
    a. I have enough time to take my family out on leisure activities
    b. I do see my relatives and friends regularly
    c. I can remember the last social gathering
    d. My life as a shift worker is nicely balanced
    e. I still appreciate weekends as a shift worker

4. Productivity
    a. I always give my best at work
    b. My other colleagues are putting the interest of the company at heart first
    c. We always or almost always reach our production targets

d. My manager never complains about high absenteeism and extra cost to produce
e. We do not have to cover with overtime when somebody is not at work

5. Physical Health
    a. I do not have sleep problems
    b. My appetite is still good, and have no digestion problems
    c. I am very healthy
    d. I do not get sick very often
    e. My body adopts easily to the changes of shifts

6. Psychological effects
    a. My emotional health is well controlled as a shift worker
    b. I can cope with my shift work and have no problem with anxiety
    c. I sometimes very tense during my shift
    d. I feel guilty that I cannot fulfill my roles of a father/mother, or husbandwife at home
    e. I am proud of my job and not ashamed to be a shift worker

7. Shift work
    a. My shift is 8 hours or 12 hours long
    b. My shift includes working night shift
    c. I only work a normal week without weekends or with weekends.
    d. I work a 3 shift pattern, a 4 shift pattern or a straight shift

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