

**A Cost Management Program for Transport Services**  
**- A Case Study**

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## **ABSTRACT**

Company A is a mining company with a transportation division that is responsible for all transport related activities. These activities include:

- the transportation of ore from the shafts to the plant by making use of diesel and electrical locomotives and hoppers;
- the transportation of employees to and from the workplace by making use of buses and kombi's;
- the transportation of ordered materials and goods to the different operating units by using trucks and light duty vehicles (ldv's);

All of these vehicles and locomotives, as well as the roads and railway lines on which they travel, have to be maintained. The cost of services and breakdowns as well as kilometres travelled, is captured onto the internal maintenance system and is available for further analysis.

Benchmarking, outsourcing and identifying cost drivers are some of the management accounting principles that can assist to manage and reduce costs in this department.

## **UITTREKSEL**

Maatskappy A is 'n mynmaatskappy met 'n vervoerafdeling wat alle vervoerverwante aktiwiteite hanteer. Hierdie aktiwiteite behels die volgende:

- Die vervoer van erts vanaf die skagte na die aanleg vir verdere verwerking. Die erts word vervoer deur gebruik te maak van diesel en elektriese lokomotiewe.
- Werknemers word vervoer tussen hul gemeenskaplike blyplekke en werksplekke deur middel van busse en kombi's.
- Materiaal en goedere wat deur die afsonderlike besigheidsareas bestel is word deur middel van trokke en bakkies afgelewer.

Al hierdie genoemde voertuie en lokomotiewe, asook die paaie en treinspore waarop beweeg word, moet instandgehou word. Die koste wat gepaardgaan met die diens van voertuie, onbeplande defekte asook die kilometers wat elke voertuig afgelê het, word in

die interne rekenaar dienssisteem ingevoer. Die inligting is dus beskikbaar vir verdere ontleding.

Verskeie bedryfs- en bestuursrekeningkundige beginsels, soos normering, uitkontraktering en die identifisering van kostedrywers kan ingespan word om koste te bestuur en selfs te verminder.

## **LIST OF ABBREVIATIONS**

<b>ABB</b>	-	<b>Activity based budgeting</b>
<b>ABC</b>	-	<b>Activity based costing</b>
<b>BPR</b>	-	<b>Business Process Reengineering</b>
<b>IOCM</b>	-	<b>Inter-organizational cost management</b>
<b>IRR</b>	-	<b>Internal rate of return</b>
<b>Km</b>	-	<b>Kilometre</b>
<b>L</b>	-	<b>Litre</b>
<b>LDV</b>	-	<b>Light duty vehicle ("bakkie")</b>
<b>NPV</b>	-	<b>Net Present Value</b>
<b>PI</b>	-	<b>Process Innovation</b>
<b>PM</b>	-	<b>Plant maintenance</b>
<b>PONC</b>	-	<b>Price of non-compliance</b>
<b>TQM</b>	-	<b>Total Quality Management</b>
<b>ZBB</b>	-	<b>Zero Based Budgeting</b>

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# **CHAPTER 1: AN INTRODUCTION INTO THE TRANSPORT ENVIRONMENT AND THE RESEARCH OBJECTIVES**

## **1.1 BACKGROUND AND INTRODUCTION**

Company A is a mining company that consists of ten operating shafts and an opencast mine which produces an average of 14 million tons per annum. All of these mined tons have to be transported to the plant for further processing by making use of the transport services department.

The transport services department is maintained as a separate operating unit and its main objectives are:

- To transport all reef and opencast product to the plants for further processing;
- To maintain a vehicle fleet ensuring safe and reliable movement of vehicles across and beyond the boundaries of the property and the safe delivery of employees to and from their working place.

This department can be divided into three sections: Rail transport, Road transport and the engineering workshops. The engineering workshop section is responsible for all the maintenance in the Road & Rail sections and includes the hopper shed, loco shed, garages, track maintenance, road repairs, boilermaker workshop and fitter workshop.

### **1.1.1 Rail Transport**

The Rail Transport section's detailed objective is the transportation of ore from the shafts and opencast mine to the plants as well as, to a lesser extent, the transportation of materials. There are 180 people employed at this section consisting of loco shunters, loco drivers, bin off-loaders and radio operators in the control rooms.

The locomotive fleet consists of five diesel locomotives as well as 14 electrical locomotives. Each diesel locomotive is able to pull ten hoppers containing an ore load of 600 tons per locomotive trip, as opposed to the electrical locomotives that can pull a



span of 12 hoppers containing an average of 720 tons per locomotive trip. The amount of locomotive trips being done on a daily basis averages sixty seven.

There are 150 hoppers in the hopper fleet. The whole fleet of hoppers is continuously rebuilt over a period of time to ensure that it retains its strength, because a hopper needs to carry up to 75 tons at a time.

## **Maintenance**

Each locomotive is scheduled to be serviced once a month to ensure that preventative maintenance is being conducted to minimize repair cost to components. The qualified technicians and electricians in the loco shed tend to the services, possible accident repairs and breakdowns.

The hoppers are maintained by the boilermakers, fitter-and-turners and artisan helpers in the hopper shed and scheduled monthly services are being conducted.

The maintenance of the railway lines are being done by track maintenance crews consisting of ten people each. Maintenance on the electrical overhead lines are being conducted by electricians and signalling technicians. Regular inspections are necessary to ensure that the standard of the railway overhead lines and tracks are on par with legislative standards.

### **1.1.2 Road Transport**

The company's road infrastructure consists of 60 kilometres of tar roads and 50 kilometres of gravel road to which proper maintenance is essential. This includes pothole repairs, placing of road signs and the painting of necessary lines and road marks. Three road maintenance crews, consisting of six people per crew, are responsible for the fulfilment of these maintenance requirements.

As previously stated, the main objective of this section is the transportation of employees across the property by making use of buses as well as the transportation of materials from the material stores to the operating units with trucks.

Other functions of road transport include:

- *Yellow equipment section:* This section includes a grader (picture1.2), back actor, mobilifts, front end loaders, articulated dump trucks and teleloggers (picture 1.1). The grader is used to maintain the roads; front end loaders and articulated dump trucks (ADT's – picture 1.3) move ore and front end loaders (picture 1.4) assist in loading the opencast ore onto the hoppers; teleloggers are used to unload ordered materials from the trucks.



**Picture 1.1: A telelogger moving materials on the shaft bank**



**Picture 1.2: A Grader**



**Picture 1.3: An articulated dump truck (ADT)**



**Picture 1.4: A front end loader loading ore into a hopper**

- *Forklifts:* These are mainly utilized by the main material store and in the plant to move batches of stock and other heavy items around (picture 1.5).



**Picture 1.5: A forklift**

- *Light duty vehicles (LDV)*: Used to transport employees when they are called out for urgent work, breakdowns or working overtime. Assisting with transportation of minor materials from the stores to the operating units. The ldv's can be subdivided into 1 tonner bakkies and half tonner bakkies.

**Vehicle fleet of Company A:**

Buses	42
Trucks	40
Light duty vehicles (LDV's)	80
Articulated dump trucks	12
Front end loaders	9
Forklifts	26
Tractors	17
Trailers	39
Kombi's	9
Ambulances	6
Mobilifts	6
Grader	1
Back actor	1

**Table 1.1**

The fleet of vehicles consumes an average of 35 000 litres of petrol at an average price of R5,20 per litre and 18 000 litres of diesel at an average price of R5,10 per litre. The total monthly kilometres travelled, average 523 000km and 1 786 hours on the yellow equipment.

**Vehicle Replacement**

It is of great importance to have a vehicle replacement policy in place, in order to ensure that vehicles are replaced on a regular basis to ensure conformation to safety standards and low maintenance cost.

## **Vehicle maintenance**

The maintenance on the total vehicle fleet is the responsibility of the two garages: One on the Western side of the mining operation and one on the Eastern side. Mechanics and their helpers carry out interval services on all of the vehicles, depending on either the frequency (months) or kilometres or hours. Auto-electrical work and panel beating are also part of the services provided by the garage.

The planning department handles the scheduling of all services and preventative maintenance by issuing notifications to the foremen in charge of the garages. Job cards are prepared for each job that is scheduled to be executed and the necessary vehicle spares, oil and other consumables are ordered according to the job card specifications. The motor mechanic will print the job card and carry out the service or specific repair. After completion of the service, the job card will be handed back to the planning department who will then close it.

Sometimes it is necessary to overhaul engines, differentials and gearboxes. Any warranties on spare parts, such as engines, gearboxes, starter motors are recorded onto the planning system and in event of failure on any of these parts, a warranty claim can be made against the supplier who will have to repair or replace the part at no cost to Company A.

### **1.1.3 Workshops**

There are two workshops that operate essentially as profit centres: a Boilermaker workshop and a Fitter workshop. These workshops receive work requests from outside sections (e.g. the plants or shafts) to manufacture or repair equipment.

The foreman of the particular workshop will prepare a quotation for the requested work, which has to be approved by the person requesting the job before it is executed. The total cost of the completed job, including the labour portion, overheads and material used, is then charged to the requisitioner's cost centre after the job was done to his satisfaction.

## **1.2 PROBLEM STATEMENT**

It is evident from the above that it is necessary to develop a cost management program for this department to ensure that it is operating at the lowest cost. A thorough investigation will be conducted into the maintenance and running cost of the fleet.

## **1.3 HYPOTHESIS**

A proper, in-depth analysis of the current transport services will indicate where a need for cost accounting systems exist, which can be implemented to ensure adequate cost control, analysis and evaluation.

## **1.4 RESEARCH OBJECTIVES**

### **1.4.1 Primary Objective**

The purpose of this study is to establish the significance of cost management in a service department which has the goal of adding value to the rest of the company.

Recommendations will be made regarding several relevant cost accounting topics and techniques that can be adopted / employed to ensure improvement on the current state of affairs.

### **1.4.2 Secondary Objectives**

Secondary objectives include the following:

1. To assess the current cost management systems and measure the department's performance to recommend improvements to current activities.
2. To improve on the existing activity-based management system in order to assist management with decision-making, budgeting, planning and controlling. It will be accomplished by standardising reports to provide accurate but relevant information on a timely basis.

## **1.5 RESEARCH FIELD**

The application of cost accounting techniques, with special reference to cost management and performance measurement will be evaluated at the transport services department of Company A.

## **1.6 METHOD OF INVESTIGATION**

The methods of investigation that will be used in this research are as follows:

### **1.6.1 Literature study**

A literature study will be conducted on the topic of several management accounting techniques, which will include text books and relevant articles from journals, magazines and the internet.

### **1.6.2 Empirical study**

Informal interviews will be held with the management team, the planning department and the foremen in charge of the different sections at this department.

Information will also be gathered through observing daily activities in the department and the correct application of relevant cost management techniques in the workplace.

## CHAPTER 2: COST AND QUALITY MANAGEMENT

### 2.1 INTRODUCTION

Cost and quality management is an essential tool that management accountants should use in order to assist production managers to improve current operations in a cost effective manner. Various aspects are discussed in this chapter.

### 2.2 DEFINING COST MANAGEMENT

Cost management focuses on cost reduction rather than cost containment. Whereas traditional cost control systems are routinely applied on a continuous basis, cost management tends to be applied on an ad hoc basis when an opportunity for cost reduction is identified (Drury, 2004:944).

From the above, the assumption can be made that Cost Management is sometimes confused with Cost Control. Drury (2004:944) defines *Cost management* as all of those actions that are taken by management to reduce costs by studying the cost drivers and suggesting improvements in processes. Actions taken can be prioritized based upon information extracted from the accounting or plant maintenance system or simply by reviewing the process. This will lead to process improvements and related cost reductions will follow as well as customer satisfaction. One should not seek to reduce cost at the expense of customer satisfaction because it might result in business losses.

*Cost control* denotes the comparison of actual results versus the budget, analyzing any variances that occur, and finally establishing a remedial action to prevent deviations from the set standard (Drury, 2004:944).

In a recent article published by La Grange and Strydom (2006:22), management accountants were defined as "multidisciplinary, dynamic, forward-thinking business advisors, who add value to the business process and who shouldn't just report on whether targets have been met". Although they are much involved as business partners, management accountants also act as the *financial conscience* of management.



Management accountants are market driven, as opposed to financial accountants who are regulation driven. As a result, management accountants are able to offer valuable information and advice to management in their search for opportunities.

*Inter-organizational cost management (IOCM)* is a concept that requires the recognition of transaction cost. By introducing IOCM, the organizations overall performance can be improved by managing its relationships with its external stakeholders such as suppliers and customers.

## 2.3 COST SYSTEMS

Managers use product cost for various reasons such as to value inventories and to assist in decision-making. By studying the different cost systems, an understanding can be gained of how unit costs are ordinarily computed.

### 2.3.1 Process Costing

A process costing system is used in those manufacturing situations where a single homogenous product is produced for long periods of time (Garrison *et al.* 2006:88). In this system, the cost object is masses of identical or similar units of a product or service. Examples of these homogenous products in the transport environment include filters and tyres.

The basic formula for process costing is (Garrison *et al.* 2006:88):

$$\text{Unit product cost} = \frac{\text{Total manufacturing cost}}{\text{Total units produced}}$$

### 2.3.2 Job Costing

Vigario (2001:17) defines job costing as the accumulation of all costs incurred in doing a job such as building a house or servicing a bus. The job order costing system is used in situations where many different products are produced each period. The costs will include direct, indirect and overhead costs. The overhead costs are allocated on a pre-determined basis. Garrison *et al.* (2006:89) defines this pre-determined overhead rate as

the rate used to charge overhead costs to jobs in production; this rate is established in advance for each period by using estimates of manufacturing overhead cost and production activity for the period.

$$\text{Pre-determined overhead rate} = \frac{\text{Estimated total manufacturing overhead cost}}{\text{Estimated total units in allocation base}}$$

Note that the pre-determined overhead rate is based on estimates rather than actuals, because the rate is determined before the period commences and is used to apply overhead cost to jobs throughout the period. The process of assigning overhead cost to jobs is called "overhead application" (Garrison *et al*, 2006:89).

In the job costing system, the cost object is an individual unit (such as a house), batch, or a lot of a distinct product or service called a *job* (Horngren *et al*, 2006:99). The product or service is often custom-made. This product is a cost pool that collects the cost of materials and activity to create it.

### 2.3.3 Activity based costing (ABC)

Vigario (2001:91) defines Activity Based Costing as a system of allocating production overheads to products manufactured in a manner that is more reasonable than the traditional method of using a single allocation base such as labour hours. ABC is an accounting technique that allows an organization to determine the actual costs incurred associated with each product and service produced by the organization.

On the website [12manage.com](http://12manage.com) and [valuebasedmanagement.net](http://valuebasedmanagement.net), ABC is defined as a costing model that identifies the cost pools, or activity centres, in an organization. It assigns costs to products and services (cost drivers), based on the number of events or transactions that are taking place in the process of providing a product or service. As a result, Activity Based Management can support managers to see how shareholder value can be maximized and how corporate performance can be improved. Historically, cost accounting models related the indirect costs on the basis of total volume.

A typical ABC cost system will consist of the following steps (iCentre website):

1. Determine the activities that relate to the overheads

2. Quantify the activity cost
3. Determine the cost drivers associated with the activity
4. Determine the cost driver rates by dividing the activity cost by the cost driver volume.
5. Apply the rates as determined in step 4 to a product.

According to Vigario (2001:95) ABC is in a sense very similar to zero based budgeting or zero based costing, because in all three instances, the idea is to re-think the cost structure of a product so that a better "cost" for the product is arrived at. It is important to know what the total cost of a product is in order to establish whether or not it adds value to the business unit in terms of profitability.

Valuebasedmanagement.net lists the typical **benefits** of ABC as the following:

- It identifies the most and least profitable customers, products and channels
- Determines the true contributors to- and detractors from- financial performance
- Track costs of activities and work processes
- Easily identify root causes of poor financial performance
- Achieve better positioning of products
- Equip managers with cost intelligence to simulate continuous improvement
- Accurately predict costs, profits and resources requirements associated with change in production volumes, organizational structure and costs of resources.

With the costing based on activities, the cost of serving a customer can be ascertained individually. By deducting the product cost and the cost to serve each customer, the customer's profitability can be determined (valuebasedmanagement.net).

The implementation of ABC can help to ensure that the employees understand the various costs involved, as per valuebasedmanagement.net. This will enable them to analyze the cost, and to identify the activities that add value and those who do not add value. Improvements can be implemented and the benefits can be realized. This is a continuous improvement process in terms of analyzing the cost in order to reduce or eliminate the non value added activities and to achieve an overall efficiency.

Time driven activity based costing is the newest approach to Activity Based Costing suggested by Arthur Kaplan and Steven Anderson. This approach is discussed on the website [valuebasedmanagement.net](http://valuebasedmanagement.net) and [12manage.com](http://12manage.com). It is a revised version of the ABC model that entails that managers estimate the resource requirements of each transaction, product, service or customer rather than to rely on time-consuming and costly employee surveys. This model is simpler since it requires only estimations of two parameters: How much it *costs per time unit of capacity* to supply the required resources to the business activities (total overhead expenditure of a business unit divided by the total number working hours of the employee) and an *estimation of how much time it takes to carry out a single unit* of each activity type (estimation done by manager).

This "time driven ABC" approach addresses the technical problems that are incurred by the employee surveys such as not considering idle or unused time, and it supports time equations which enables the ABC model to disclose the intricacy of operations in the real-world by showing how specific orders, customers and end activities characteristics cause processing times to vary.

#### 2.3.4 Kaizen costing

A major feature of Kaizen costing is that workers are given the responsibility to reduce cost and to improve processes. Basically a target cost reduction is determined which is then applied to the actual expenditure of the previous year. This figure will then be the target for the new financial year ([Valuebasedmanagement.net](http://Valuebasedmanagement.net)). Drury (2004:950) states that kaizen costing focuses on the production processes and cost reductions are derived primarily through the increased efficiency of the production process.

The Kaizen method consists of five basic elements ([valuebasedmanagement.net](http://valuebasedmanagement.net)):

- Teamwork
- Personal discipline
- Improved morale
- Quality circles
- Suggestions for improvement.

Out of this basis arise three key factors (valuebasedmanagement.net):

- The elimination of waste and inefficiency
- The Kaizen 5-S framework for good housekeeping:
  - Seiri* – tidiness
  - Seiton* – orderliness
  - Seiso* – cleanliness
  - Seiketsu* – standardized clean-up
  - Shitsuke* - discipline
- Standardization

Kaizen costing is of best use in situations where long term change is required. If the situation requires short term success and change, it is better to make use of the Business Process Reengineering concept which will be discussed later in this chapter.

## 2.4 COST OF QUALITY

### 2.4.1 Defining Total Quality Management (TQM)

Total Quality Management (TQM) is a management style founded on the bases of producing quality service as specified by the customer. It can be defined as quality-centered, customer-focused, fact-based, team-driven, senior management-led process to achieve an organization's strategic imperative through continuous process improvement (Dale *et al*, 1999:16).

The word "**total**" in TQM means that everyone in the business unit must be involved in the continuous improvement effort; the word "**quality**" refers to the concern for customer satisfaction; the word "**management**" represents the people and processes needed to achieve the set standard of quality (tkdtutor.com, 2006).

In the BPP textbook for CIMA studies, Business Strategies (2004:406), TQM is defined as an integrated and comprehensive system of planning and controlling all business functions so that products or services are produced which meet or exceed customer expectations. TQM is a philosophy of business behaviour, embracing principles such as employee involvement, continuous improvement at all levels and customer focus, as well

as being a collection of related techniques aimed at improving quality such as full documentation of activities, clear goal setting and performance measurement from the customer perspective.

Drury (2004:959) suggests four categories of cost of quality that should be reported:

**Prevention costs:** These are the cost incurred in the process of preventing the production of products that do not conform to specifications. Examples include the cost of preventative maintenance, quality planning and training as well as the additional cost of higher quality raw materials or other resources. Adequate training of the employees participating in the production process will ensure that they know exactly what to do and mistakes are eliminated.

**Appraisal costs:** These are the costs incurred in the process of insuring that products meet the set quality conformance standards. Examples include costs of conducting quality audits and field tests.

**Internal failure costs:** These are the costs incurred when resources and products fail to meet the set quality standards and will occur before the product is distributed to the customers. It includes the cost of scrap, repair, downtime as well as work stoppages due to defects.

**External failure costs:** These costs are incurred when products of inferior quality are delivered to customers and sent back by them to the suppliers. Examples include the cost of warranty claims received from clients, repairs to returned products, and cost of handling customer complaints as well as damages to the company's image.

#### **2.4.2 The main principles of TQM**

Dr. W. Edward Deming invented the Fourteen Points of Management that, according to both the websites [valuebasedmanagement.net](http://valuebasedmanagement.net) and [tkdtutor.com](http://tkdtutor.com), represents the essence of Total Quality Management (TQM):

**1. Create constancy of purpose for improvement of product and service.**

The organization's aim and purpose should be published and distributed by management to all employees, who should constantly demonstrate their commitment to the said statement.

**2. Adopt the new philosophy of quality**

Everyone in the company (from top management to the lowest employees) must accept the quality challenge, take charge of their responsibilities and take on the leadership required for change in accordance with the new philosophy.

**3. Cease the dependence on mass inspections to achieve quality**

The purpose of inspections is not just to find defects, but also to try and improve processes and reduce cost. However, if quality is built into the service from the start, the need for these mass inspections may become redundant.

**4. End the practice of awarding business on the basis of price tags alone**

Organizations should avoid awarding contracts based solely upon the lowest bid. The minimizing of total cost should be reviewed. A single supplier should be the sole supplier for any one product in order to eliminate cost overruns and provision of low quality products. The company should not be penny wise and pound foolish by saving money by purchasing inferior quality products.

**5. Identify problems and work continuously to improve the system of production and service**

TQM is a continuous process that doesn't have an end, unlike most programs that has a beginning, middle and end. The system of quality service should constantly be improved.

**6. Institute training**

Methods of formal training should be implemented especially for new employees. Provision of "on the job training" is not acceptable, because the old ways of doing things will be adopted by the new employees, who are being taught by people in the company who might resist change.

**7. Adopt and institute leadership**

Leadership is a learned skill and companies should train their managers to be good leaders.

**8. Drive out fear of the workplace**

Employees grow accustomed to do only what is necessary to get a good appraisal, not what is required for *quality*. They should not be afraid to suggest new ideas and the company should tolerate failures when employees are experimenting with those new ideas.

**9. Break down barriers between departments**

Teambuilding rather than competition among the different departments should be encouraged by upper management. The efforts of the teams should be to attain the goals and aims of the company as a whole.

**10. Eliminate slogans, exhortations, and targets for the workforce**

Management should refrain from using slogans and targets requesting zero defects and improved productivity without providing them with the means to achieve it.

**11. Eliminate numerical quotas**

Management should promote achieving *service quality* rather than quantity.

**12. Remove barriers that rob people of pride and workmanship**

Companies should abolish merit rating systems and should not blame employees for system problems or failures beyond their control. The line managers should rather assist them to seek appropriate solutions.

**13. Encourage education and self-improvement for everyone**

Promote continuous learning for everyone involved in the company. By establishing a possible career path for an employee, the necessary courses and possible individual development opportunities can be identified and pursued.

**14. Take action to accomplish the transformation**



Everyone in the company should be put to work in order to accomplish the transformation of generating best quality. An information centre should be established in order to keep the employees informed about the transformation process.

### **2.4.3 Discussing the advantages of TQM**

On the website tkdtutor.com it is stated that by eliminating errors and doing things right the first time round, time and resources will be saved.

TQM will result in higher productivity, increased morale, reduced cost and greater support from customers. These benefits may also lead to the improvement of the company's public image.

If implemented correctly, TQM may identify and eliminate costly processes and implement cost-saving measures. In public organizations these saved resources may be viewed as "profits".

### **2.4.4 Five Deadly Diseases**

The Tkdtutor.com website explains the five deadly diseases that should be eliminated from the organization before the implementation of TQM can be successful. If they are not eliminated, they might prevent the TQM transformation from happening as well as destroy the organization gradually over a period of time.

They are described as follows:

#### **1. Bottom-line management**

If an organization is only concerned with the bottom line and manages solely by-the-numbers, it is certainly doomed for failure. Management who relies heavily on numerical targets chooses the easy way out. They should know and get involved in the process, understand the issues and set examples for their subordinates to follow.

## **2. Evaluation using organized by-the-numbers performance appraisals**

Instead of using performance appraisals, managers should provide personal individual comments that will assist employees in identifying areas for personal improvement. If organized performance appraisals, such as merit ratings and annual reviews of performance, are used, it sometimes results in rankings, forced quotas and many grading categories that act to create competition. This leads to a breakdown in teamwork within the business unit.

## **3. Emphasis on short term gains**

If the employees were rewarded on short term gains in the past, the employees will tend to work towards those short term gains. Management must persuade the employees to believe that the company will give priority to long-term improvement over short term gains.

## **4. Lack of consistency of purpose**

If the company has a lack of consistency of purpose, employees might be unsure about their continued involvement in the organization. Long term plans that promise attention to quality should constantly be pursued.

## **5. Mobility of the workforce**

When employees are leaving the company on a constant basis, it indicates that there are serious problems within the organization. If the other four diseases are cured, it may help to eliminate this one. Management must ensure that all employees feel they are an integral part of the company. Lower than market related employee remuneration will also have a great negative impact on staff turnover.

### **2.4.5 Other important issues**

#### *Quality Framework*

Three quality factors must exist in the organization for TQM to be implemented and maintained successfully: The organization must have an established base level of service; it must have interaction and direct contact with its customers; it must have

proper service surroundings, such as the quality of its vehicles and buildings. After the quality framework has been established, the organization's focus can be determined.

#### *Organization Focus*

Before TQM can be implemented, the management must determine the company's common purpose (focus). This focus consists of three elements: the vision, mission statement and values of the organization. The vision is where the company wants to be in the future; the mission statement describes the organization's basic purpose and expected results; values guide the organization's conduct by generally establishing ground rules for how the company will operate. After its focus has been established, the company can start empowering its employees.

#### *Employee empowerment*

Employees are given a degree of control over the company's operation. When the workforce is empowered, they feel that they play an active part in the organization's decision-making process. They will begin to take pride and ownership in their work, which will lead to improvement in their job performance that will in turn lead to increased overall quality improvement.

#### *Participative Management*

Participative management entails utilizing the cumulative skills and expertise of employees to solve problematic issues and to improve quality of service. The emphasis falls on group effort and that all members of the organization should share authority, responsibility, accountability and decision-making.

## **2.5 BUSINESS PROCESS REENGINEERING (BPR)**

### **2.5.1 Defining BPR and Process Innovation**

"Business Process Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed" as defined in the BPP Business Strategy textbook (2004:368).

Drury (2004:956) explains that business process re-engineering involves examining the business processes and making substantial changes to how the organization or department currently operates. This business process consists of a pool of activities that are linked together in a co-coordinated manner to achieve a specific objective. The aim of business process re-engineering is to improve the key business processes in an organization by focusing on simplification, cost reduction, improved quality and enhanced customer satisfaction.

A distinguishing feature of business process re-engineering is that it involves radical and dramatic changes in processes by abandoning current practices and reinventing completely new methods of performing these processes.

### **Process innovation (PI)**

The theory of Process Innovation was introduced in 1993 by Davenport (BPP Business strategy, 2004:374). Process Innovation combines the adoption of a process view of the business with the application of innovation to key processes. What is new and distinctive about this combination is its enormous potential for helping any organization to achieve major reductions in either process cost or time, or major improvements in flexibility, service levels, or other business objectives.

PI is in a sense very similar to BPR, but the distinguishing factor of PI is that it focuses to a greater extent on the creation of new processes. PI is a more radical approach than BPR (BPP Business Strategy 2004:374).

BPP Business Strategy (2004:374) quotes Davenport's five steps of process innovation:

*Identify the business areas or processes suitable for innovation;*



*Identify the tools that can be used to innovate (change levers);*



*Develop statements of purpose for the process (process vision);*



*Understand existing processes and prepare for new systems and processes;*



### *Design and prototype new processes*

Although innovation leads to competitive advantage, it also causes additional cost and a lot of uncertainty.

#### **2.5.2 Principles of BPR**

Seven principles for BPR are discussed on the iCentre website:

1. Organize around outcomes, not tasks. Processes should be designed to achieve a desired outcome, rather than focusing on existing tasks.
2. Identify all the current processes in the organization and prioritize them in order of urgency for redesign.
3. Information processing should be integrated into the real work which produces the information. This will eliminate any differences between information gathering and information processing processes;
4. Geographically-dispersed resources should be treated as if they are centralized. The benefits of centralization can then be obtained;
5. Parallel activities should be linked in the workflow rather than just integrating its results. This would involve co-ordination and teamwork between employees working on different aspects of a single process.
6. Put the point of decision-making where the job is performed: The person doing the job should be allowed to be self-managing. The traditional distinction between workers and management can be abolished: decision aids such as expert systems can be provided where they are required.
7. Information should be captured once and at the source. Information can then be distributed electronically (e.g. via e-mail).

#### **2.5.3 When should BPR be used?**

It is recommended on the website [valuebasedmanagement.net](http://valuebasedmanagement.net) that certain factors should be taken into consideration when establishing when BPR should be used:

- Is the competition outperforming the company by factors?
- Are there many conflicts in the organization?

- Is there an extremely high frequency of meetings?
- Excessive use of non-structured communication? (Memo's, e-mails, etc.)
- Is a more continuous approach of incremental improvements not possible? (refer to *Kaizen*)

The iCentre website suggests that the following questions be asked in order to select a process that should be re-engineered:

- Is the process broken?
- Is it feasible that reengineering of this process will succeed?
- Does it have a high impact on the "agency's" strategic direction?
- Does it significantly impact customer satisfaction?
- Is it antiquated?
- Does it fall far below "Best-in-Class"?

#### **2.5.4 Steps to implement BPR**

Davenport, as quoted in the BPP Business Strategy textbook (2004:370), prescribed a five step approach to the Business Process Reengineering model:

##### **1. Develop the business vision and process objectives**

The BPR method is driven by a business vision which implies specific business objectives such as cost reduction, time reduction, output quality improvement, Total Quality Management and empowerment.

##### **2. Identify the business processes to be redesigned**

Most firms use an approach which focuses on the most important processes or those that conflict most with the business vision, called the "*high impact*" approach. Other firms make use of the "*exhaustive approach*" that attempts to identify all the processes within an organization and then prioritize them in order of redesign urgency.

##### **3. Understand and measure the existing processes**

In order to avoid the repetition of old mistakes and providing a baseline for future improvement, it is necessary to understand each aspect of the current process.

#### **4. Identify IT levers**

Awareness of IT capabilities can be put to good use when designing a process.

#### **5. Design and build a prototype of the new process**

The actual design should not be viewed as the end of the BPR process. Rather, it should be viewed as a prototype, with modifications following if the need exists. This prototype aligns the BPR approach with the quick delivery of promised results and the involvement and satisfaction of customers.

A 6<sup>th</sup> step can also be added according to the website [valuebasedmanagement.net](http://valuebasedmanagement.net):

#### **6. Adapt the organizational structure and governance model**

The organizational structure and governance model should be adapted towards the newly designed primary process.

### **2.5.5 Benefits of BPR**

The iCentre website lists the benefits of BPR as follows:

- Empowers employees
- Eliminates waste and obsolete or inefficient processes
- It often leads to significant reductions in cost and cycle times
- It assists the best organizations to remain at the top and the low-achievers to become effective competitors.

### **2.5.6 Problems with BPR**

There are some concerns that BPR has become misunderstood: It has been proven in an independent study of 100 European companies that BPR has become synonymous in managers' minds with narrow targets such as reductions in staff numbers and other cost-cutting measures (BPP Business Strategy, 2004: 371).

## **2.6 SUMMARY**

Cost management is an essential part of the daily focuses of the business unit's manager and his subordinates. If non-value added processes can be identified and

eliminated or reengineered, the total quality of service or products provided is improved. A higher quality product or service delivery will lead to a demand from customers for the specific commodity and the profitability of the business unit will increase.



## CHAPTER 3: BUDGETING

### 3.1 INTRODUCTION

Budgets in general are used to express the plans of the organization in monetary terms. The total budget of all the departments combined represents the blueprint of the company's strategy for the forthcoming period(s). In company A, the transport services department uses the plant maintenance budget, the production budget (tonnages of ore to be transported as well as kilometres to be travelled) and the general and administrative budget. All of these budgets are brought together to form the total departmental budget, which will then be incorporated into the master budget of Company A.

Irrespective of the organization's size or complexity, it should not proceed doing business without an overall plan, and, in practice, most large organizations prepare some form of master budget.

### 3.2 DEFINING BUDGETS

iCentre website defines a budget as an action plan that is quantified and that stretches over a specified period of time. It attempts to estimate the input quantities and cost together with the outputs and associated revenues.

The senior management accountant of Company A defines the budget as a plan expressed in monetary terms. It is prepared and approved prior to the budget period and may show income, expenditure and capital to be employed and also provides a basis for control and performance evaluation.

Budgets form a basis for quantifying company plans which fall into three categories (Barrett, 2005:32):

- *Operating plans* ~ directed at the investment and production objectives of the firm.

- *Administrative plans* ~ objectives of the development and maintenance of the company structure.
- *Strategic plans* ~ plans dealing with the long term company objectives in relation to competitors, company growth and philosophy.

### **3.3 PURPOSE OF BUDGETS**

The purpose of budgets is (BPP Business Strategy, 2004:384):

- To enforce proper planning – It compels the company to consider the expected demand for it's products and services as well as the required resources necessary to meet this demand;
- To co-ordinate business activities;
- To communicate ideas;
- To provide a framework for responsibility accounting;
- To motivate employees and management; and
- To evaluate performance – It provides a baseline figure against which actual results can be compared.

### **3.4 POSITIVE AND NEGATIVE ASPECTS OF BUDGETARY CONTROL**

Vigarío (2001:187) states a few positive aspects of budgeting:

- It forces management to plan.
- It provides resource information that can assist in decision making processes.
- Sets benchmarks for resource use that can be utilized in performance evaluation.
- Improves the process of communication and coordination.

BPP Business Strategy (2004:384) suggests a few negative aspects of budgets, namely:

- No incentive can be paid on actual achievements if the budget is unrealistic.
- A manager may include an additional percentage of money into his expenditure budget to ensure that he will meet the targeted figure.
- Managers sometimes strive to achieve the target, but do not focus on cost management in the sense of managing the cost driver efficiency and reduction of unit cost.
- A Manager may go on a "spending spree".

- Attention is drawn away from the longer term consequences.

### **3.5 STEPS IN DEVELOPING A BUDGET**

The iCentre website presents three primary inputs into a typical budget process:

- **Plans:** The budget should reflect all innovative plans and their expected results as prepared by management.
- **Performance:** Past and current performance should be evaluated and used when preparing the budget. Uncontrollable external changes (such as the fluctuating Brent crude oil price) should also be considered.
- **People:** The communication channel between the company's stakeholders should be well developed, because the higher the quality of information used and put into the budget process, the better the chances are for a realistic budget.

### **3.6 BUDGETARY CONTROL SYSTEMS**

Budgetary control is the establishment of budgets, linking the responsibilities of executives to the requirements of a policy, and the continuous comparison of actual versus budgeted results, either to secure the objectives of that policy or to provide a basis for its revision (BPP Business Strategy, 2004:383).

Budgetary control systems are used by various companies to enforce planning, coordinate activities and motivate employees, as well as to evaluate performance. Corrective action should be taken to control deviations.

#### **3.6.1 Zero based budgets**

Vigario (2001:198) defines zero-based budgeting as a procedure that requires every manager to justify in detail the level and nature of his budget relative to the functions required for the effective achievement of specified objectives. If a budget is submitted without the underlying proper motivations, it will be rejected. The budget allowance for that section will then be zero.

The general target in zero-based budgeting is to identify and define the functions required as well as the alternative levels of performance. This technique identifies and costs all alternatives, and implements them progressively into the company based on their priority level.

Advantages of Zero based budgets include the following (Vigario, 2001:199):

- It has the potential for developing a more vibrant and interactive management team.
- It involves widespread participation: Decentralization of budget formulation to the line managers (foremen in this particular department) has the advantage of tapping the expertise of those closest to a problem or opportunity.
- Participation of the line management generates a greater degree of commitment on their part.
- It certainly improves the planning function as it requires the company and operational objectives to be clearly defined. Inefficient or obsolete operations are identified and removed.
- Since zero based budgeting requires that detail proposals and alternatives be provided to the top decision makers, the knowledge and expertise of upper level managers can be applied appropriately.
- The compulsory formal review of departmental functions generates a systematic method of judging the adequacy of performance.
- It responds to changes in the environment (within the company or elsewhere).

There are, however, a few disadvantages to this concept (Vigario, 2001:200; BPP Business Strategy, 2004:386)

- There is a larger volume of paperwork due to the amount of motivations that has to be raised.
- The major difficulty is securing co-operation from employees at the inception stage.
- Due to a lack of necessary skills in the management team, the conversion to ZBB may have to be handled by a team of outside consultants, which could create problems and high consulting fees.
- Inadequate training of line management.
- Defining the minimum level or lowest practical level of operating.

- Identification of departments where the technique can be used.

### **3.6.2 Activity based budgets**

CIMA-insight magazine (Anon, 2005:41) defines activity based budgeting (ABB) as the use of operational, non-financial measures in the creation of the financial budget. For example kilometres travelled, litres of fuel consumed per kilometre. Key business drivers should be established. According to this magazine article, the budgeting cycle of a company proves to be 20 days faster for companies that are utilizing ABB than those who don't.

The BPP textbook for Business Strategy (2004:384) defines ABB as a method of budgeting based on an activity framework and utilizing cost driver data in the budget-setting and variance feedback processes. ABB focuses more on what the business unit actually does (e.g. transporting people) rather than on the resources it buys to do it.

ABB links strategic planning with the operational control and it endeavours to identify and eliminate non-value adding activities.

### **3.6.3 Continuous rolling budgets**

Businesses are increasingly making use of rolling budgets. A continuous rolling budget is a budget that is always available for a specified future period. A month, quarter or year is added to the period that had just ended (Homgren *et al*, 2006:184). This budgeting method entails the preparation of regular forecasts (typically quarterly) that always have the same time frame. This method forces a company to look beyond the end of the current fiscal year. One advantage of rolling budgets is the fact that it eliminates some of the problems created by budgets quickly becoming outdated. Businesses, however, does not need to go through the whole business plan process every quarter (iCentre website).

Advantages of having a continuous rolling budget includes that

- The company has a 12 month forecast into the future.
- Management are reviewed on a continuous basis.

- Budgets are more realistic and up to date.
- New goals are communicated quicker and are reflected in the budget (BPP Business Strategy, 2004:385).

### **3.7 KAIZEN BUDGETING**

The term *kaizen* is used by the Japanese for continuous improvement. Kaizen budgeting is a budgetary approach that explicitly incorporates continuous improvement during the budget period into the budget numbers (Horngren *et al*, 2006:195).

An example of this continuous improvement that is built into a budget is a 5% reduction in overtime hours allowed over a certain period. Another example is an improvement on the amount of labour hours utilized when servicing a specific vehicle type, such as a truck. More jobs can be finished in a certain amount of time during the day. According to Horngren *et al.* (2006:195) a reduction in the variable overhead rate is a direct result of the reduced labour hours because the direct labour hours is the driver of these costs.

### **3.8 A SERVICE DEPARTMENT AND ITS BUDGET**

A budget for a service department can be compiled in a number of ways (BPP Business Strategy, 2004:400):

- There might be a budgeted expenditure limit for the department (a percentage of the total company's budget).
- Efficiency targets can be set by making use of standard performing measures for the department and its functions. This is, however, only possible where the department carries out routine activities.
- Targets could be set for the quality of service the department provides.
- To perform a targeted quantity of work with a budgeted number of staff.

### **3.9 HUMAN ASPECTS OF BUDGETING**

Whether the long term or short term budget targets are met, depends entirely on the employees understanding the objectives of the company and acting in such a manner that targets are achieved.

Companies sometimes offer incentives or bonuses to employees for meeting the budgetary targets. The response of the workforce is vital to the achievement of the targets set.

Horngren *et al.* (2006:199) is of the opinion that top managers must convince their subordinates that the budget is a positive tool designed to help them choose and reach goals. They are not remedies for weak management talent, a faulty organization or a poor accounting system.

### **3.10 SUMMARY**

Budgets in general are used to express the plans of the organization in monetary terms. Any changes in the strategic plans or in the short term plans should be reflected in the compiled budget in order to reflect the way that the company is operating. Some of the advantages of preparing a budget include that it compels proper planning and provides performance criteria and promotes coordination and communication within the organization.

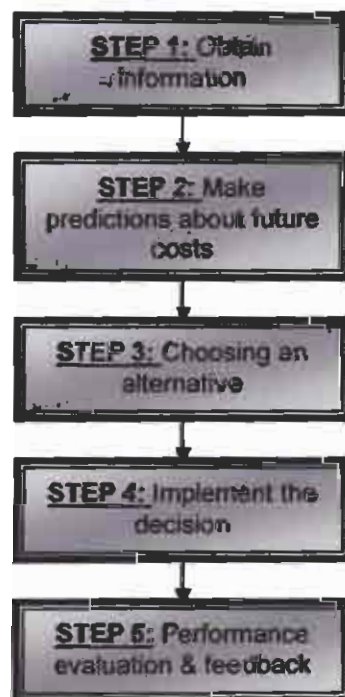
## CHAPTER 4: ASPECTS OF DECISION MAKING

### 4.1 INTRODUCTION

Decisions are made on a daily basis. Some decisions have a greater impact on life or the business than others. A very important aspect in making decisions is to derive the correct information in order to make informed decisions that will have a positive impact on the aspect of the organization in question.

### 4.2 THE DECISION MAKING PROCESS

The decision making process can best be explained by making use of flowchart 4.1 (Horngren *et al*, 2006:379):



**Flowchart 4.1**

The information gathering phase is a very important aspect and starting point of decision making. The information obtained should satisfy the following attributes:

It must be **relevant, accurate, timely, complete, concise** and **understandable**.



By making use of historical cost and occurrences as well as other relevant information, an estimate can be arrived at as to what the future cost will turn out to be that is effected by the information obtained in step 1.

The outcome of the predicted cost, will lead to the evaluation of different options that can be followed as the next course of action. The best option should be chosen.

The option chosen in step 3 can now be implemented by reorganizing the current operations.

In step 5, the performance of the option implemented in step 4 should be evaluated and feedback should be given as to if set financial targets were met that was supposed to be achieved by implementing the option (Horngren *et al*, 2006:379).

### **4.3 RELEVANT COST**

#### **4.3.1 Defining relevant cost**

The setting of standards or budgets requires the analysis of current or future costs and therefore requires the analysis of relevant cost. Vigario (2001:300) defines relevant cost as a future cash flow arising as a direct consequence of the specific decision under review.

Costs that are not relevant include

- past sunk cost (money already spent);
- future spending already committed by separate decisions;
- cost which are not of a cash nature (e.g. depreciation); and
- absorbed overheads (only cash overheads incurred are relevant to a decision).

The relevant cost of a unit of production is usually the variable cost of that unit plus (or minus) any change in the total expenditure on fixed cost (Vigario, 2001:300).

Horngren *et al*. (2006:380) narrows it down to two key aspects that relevant cost must comply to:

- the cost and revenues must occur in the future, and
- they must differ among the alternative courses of action.

#### **4.4 HIRE VERSUS PURCHASE**

One of the important decisions the transport services department of Company A often has to deal with is whether to hire a specific vehicle or to purchase it for a specific function.

The company or department has to evaluate both the qualitative and the quantitative matters: The quantitative matters dealing with cost and the qualitative matters including:

- reduction of dependence on outside supplier;
- technology changes ~ it will be better to hire a vehicle that can be exchanged for something new every once in a while than being stuck with "old technology" equipment that is not able to perform the higher standards required by business improvement.

Qualitative factors are outcomes that cannot be measured in numerical terms (Homgren *et al*, 2006:381). Quantitative measures are outcomes that are measured in numerical terms. Some of the quantitative factors can be expressed in financial terms, such as cost of direct materials and direct manufacturing labour. Others are non-financial: they can be expressed in numerical terms, but not in financial terms, such as amount of kilometres travelled for trips that are not production related and the amount of kilometres that a specific vehicle class can travel on one litre of fuel.

#### **4.5 EQUIPMENT REPLACEMENT DECISIONS**

There are financial decisions to be considered in every corner of an organizations' fleet management strategy. The biggest issue is not the purchase price of the vehicle, but its comparative cost over its lifespan. Ashley Martin, an industry analyst was quoted in an article by Gray (2006(5):25-28) saying: "You must always base your decision-making on whole life costs, not list prices".

Horngren et al. (2006:396) stated that emphasis should be put on the idea that all past cost and, in particular book value (that is the original cost minus accumulated depreciation) of the existing equipment are irrelevant.

**EXAMPLE 1:** Based on the operation of the Transport Services department of Company A, assume an old bus must be replaced by a new one. The first step will be to identify the bus in the fleet which has the worst key performance indicators, such as maintenance cost or running cost per kilometre and the kilometres achieved per one litre of fuel. Assume that Company A wants to replace a high fuel consuming bus with a newer model. The new vehicle will be more fuel efficient and less maintenance cost will have to be spent on it due to its age. Revenues of Company A will not be affected, because the bus is used to transport employees between the operating units. Summary data on the old bus currently in operation and its replacement is available:

	Old Bus currently in fleet	New Replacement Bus
Original cost	R350,000	R963,000
Useful life	10 years	10 years
Current Age	7 years	0 years
Remaining useful life	3 years	10 years
Accumulated depreciation*	R296,000	-
Book value	R54,000	-
Current disposal price (in cash)	R180,000	-
Terminal disposal price 3 years from now	0	R250,000
Annual operating cost	R130,000	R80,000

**Table 4.1** \* Depreciation is calculated by using the reduced balance method at 20%

In order to focus on the main concept of relevance, the time value of money is not considered here. The question now arises whether or not Company A should replace the bus with a new one.

The definition of relevance can be applied to four items mentioned in table 4.1:

1. *The book value of the old bus of R54,000.* This is irrelevant, because it is a historical cost (sunk cost). Nothing can change what has already happened.
2. *Current disposal price of old machine R180,000.* Relevant; this qualifies as an expected future benefit that differs between the alternatives.
3. *Gain or loss on disposal of the asset of R126,000.* Irrelevant, because it is just the algebraic difference between the book value (which is irrelevant) and the disposal price (which is relevant).
4. *Cost of new machine ~ R963,000.* Cost is relevant, because it is also an expected future cost that will differ between alternatives.

The cost comparison of replacing the old bus with the new one using the relevant items only, can be summarized as follows:

	Keep	Replace	Difference
Cash-operating cost	R130,000	R80,000	R50,000
Current disposal price of old bus	0	(R180,000)	R180,000
New machine, written off periodically as depreciation	0	R103,401	(R103,401)
<b>Total relevant costs</b>	<b>R130,000</b>	<b>R203,401</b>	<b>R126,599</b>

#### 4.6 OUTSOURCING VERSUS IN-SOURCING

Horngren *et al.* (2006:384) defines **outsourcing** as the process of purchasing goods and services from outside suppliers rather than producing the same goods or providing the same service within the company (**in-sourcing**).

For example, currently Company A has a road repairs crew consisting of seven members that tends to the maintenance and repairs that has to be done on the premises' roads. Two track maintenance crews consisting of ten members each is also responsible for the maintenance and repair work to be done on the railway tracks. Options should be investigated to outsource the maintenance work to BEE companies which might result in a cost saving to the company.

#### **4.7 SENSITIVITY ANALYSIS**

The official terminology in the BBP Business Strategy textbook (2004:333) defines Sensitivity Analysis as "a modelling and risk assessment procedure in which changes are made to significant variables in order to determine the effect of these changes on the planned outcome. Particular attention is then paid to the identified variables as being of special significance".

Sensitivity analysis is used during strategic planning processes and involves asking "what if?" questions. A number of different results will be produced if the values of the identified variables are changed (BBP Business Strategy, 2004:333). For example, the greatest part of the operational cost of the vehicle fleet is the cost of fuel (diesel or petrol). The price of these commodities is totally dependant on the price of Brent crude oil that indicated a lot of fluctuations over the past 12 months.

#### **4.8 SUMMARY**

Data is only valuable information if it changes the person that uses its planned course of action. The value of this information is presented in the difference between the value of the original course of action and the action taken after the information has been taken into consideration. When accounting measures form part of the information, the measuring unit must be relevant, stable, understandable, cost effective and precise.

## **CHAPTER 5: PERFORMANCE MEASUREMENT**

### **5.1 INTRODUCTION**

Measuring the performance of the organization and its employees is crucial for its successful existence and to identify areas that require improvement as well as the possible payment of incentives.

### **5.2 MEASURING PERFORMANCE**

Improvement needs to be measured in a way that it is clearly understood and to assist in managing the improvement process. The best way to measure improvement is to calculate what it costs if things are done the *incorrect* way. The Proudfoot Consulting firm (2001:5) calls this measurement the "Price of Non-Compliance (PONC)". According to them, the PONC activities include:

- Reprocessing
- Unplanned service (breakdowns)
- Excess inventory
- Complaint handling
- Downtime
- Rework
- Returns
- Staff turnover
- Excess work in progress
- Strikes
- Absenteeism (when people are not at work irrespective of the reason why)

PONC is the price of waste: wasted time, effort and materials. When calculating the price of non-compliance, one discovers how much money can be saved by meeting requirements the first time, every time. It is of impeccable importance to measure processes and improvements in order to get management's attention, prioritize identified problems in order to decide upon corrective actions, and to see how well did the department succeed in their efforts to improve.

The Centre for Business Performance at the Cranfield School of Management (as quoted by Kennerly *et al.* (2006(2):32)) conducted research and showed that companies generally implement performance management systems (PMS) in order to:

- Monitor productivity
- Communicate strategy
- Reduce costs
- Review their business strategy
- Support their reward systems
- Control operations.

These studies have also indicated that organizations with integrated and balanced PMS's perform better than those without one.

### **5.3 WHAT SHOULD BE MEASURED?**

In order to prevent a company from having a surfeit of performance measures, Brooks (2006(5):37) suggested that at least measures for the following elements should be included in a "diary of measures":

- Financial performance: broken up into revenue and cost components per business unit;
- Financial condition, divided into assets, liabilities and equity components also per business unit;
- Physical quantities of inputs and outputs;
- The physical condition of property, plant and other assets;
- Operating statistics such as hours worked plant and vehicle utilization, temperatures and tyre pressures.
- And measurable elements of the workforce.

### **5.4 PERFORMANCE MANAGEMENT (PM)**

Performance management is a strategic management approach for monitoring how a business is performing.

#### **5.4.1 Advantages and disadvantages of performance management**

The main advantages and disadvantages of Corporate Performance Management are highlighted by Kennerly *et al.* (2006(2):33) in their article on performance management.

**Advantages:**

- It focuses the employees' attention on what is important to the organization;
- It drives improvements to the business and encourages employees to focus on continuous improvement;
- Improves customer satisfaction;
- It improves productivity;
- Increases employee satisfaction;
- And it improves the company image.

**Disadvantages:**

- Performance management consumes excessive management time;
- It adds to bureaucracy with too many measures;
- Overcomplicated measures confuse it's users;
- The real priorities of the company is over-shadowed by these measures;
- It forces managers to refresh their performance review methods on a continuous basis.

**5.4.2 Performance measurement in a services department**

The performance of a service department is more difficult to measure due to the fact that there is no physical product to assess. Services have three characteristics: it is intangible, they are consumed at the same time it is provided and it cannot be stored. Two methods of setting a standard measure of performance in such a department are (BBP Business Strategy, 2004:401):

- Standard cost per unit of activity; and
- Standard quantity of output per unit of resource consumed.

The only prerequisite for these methods to be used are that there has to be a measurable quantity, volume or activity in the department.



Activity in a transport department could be measured in tons or kilometres (for example in Company A the tons of ore delivered to the plant and kilometres travelled) and standards could be established for:

- Cost per ton per kilometer
- Kilometres travelled per litre of fuel consumed; and
- Drivers' hours per ton per kilometre.

In measuring production performance, it is necessary to distinguish between fixed and variable cost, between controllable and uncontrollable cost, between directly attributable costs and shared general overheads. It is important that these distinctions also be made for the services department. The department may incur costs that are variable with the volume of activity happening in the department. These costs should be identified and be reflected on a report consisting of the actual performance versus a flexed budget. A flexed budget is reflected by multiplying the planned variable rate by the actual volume of activity that happened. Also the department's directly attributable fixed cost should be identified, because these are running cost that could be saved if the department should close down.

## **5.5 BENCHMARKING**

"In order to identify the best way of performing activities and business processes, organizations are turning their attention to benchmarking which involves comparing key activities with world class best practices. Benchmarking attempts to identify an activity that needs to be improved and finding a non-rival organization that is considered to represent world class best practice for the activity." (Drury, 2004:965).

### **5.5.1 Defining benchmarking**

"A benchmark is a standard of performance" (iCentre website).

The website [valuebasedmanagement.net](http://valuebasedmanagement.net) defines benchmarking as a systematic comparison of organizational processes and performance to create new standards or to improve existing processes. Benchmarking models are used to determine how well a

business unit, division, organization or corporation is performing compared with other similar organizations. A benchmark is often used to improve communication, professionalizing the organization or processes or for mere budgeting reasons. Traditionally, the performance of specific measures or identified processes was compared with previous measures from the same organization at different times. This could be a good indication of the rate of improvement within the organization. However, it could be that although the organization is improving, the competition is improving even faster.

The Benchmarking Exchange website (TBE) publishes three definitions of benchmarking in three ways:

- *"Benchmarking is a tool to help you improve your business processes";*
- *"Benchmarking is the process of identifying, understanding, and adapting outstanding practices from organizations anywhere in the world to help your organization improve its performance"; and*
- *Benchmarking is a highly respected practice in the business world. It is an activity that looks outward to find best practice and high performance and then measures actual business operations against those goals".*

Benchmarking is often referred to as **Best Practices, Exemplary Practices or Business Excellence.**

Some business processes are commonly found in all industries, such as the finance function and the human relations function. Whether it is a mine or a bank, people need to be managed and accounts need to be authorized and paid. These processes can be benchmarked very effectively. TBE calls it "getting out of the box".

### **5.5.2 Types of benchmarking**

The Valuebasedmanagement.net website recognizes four types of benchmarking methods:

- **Internal:** benchmarking within a corporation (between business units)
- **Competitive:** benchmark performance or processes with competitors
- **Functional:** benchmark similar processes within an industry
- **Generic:** comparing operations between unrelated industries.

12manage.com adds another type namely **collaborative benchmarking:** benchmarking carried out collaboratively by groups of companies (e.g. subsidiaries of a multinational in different countries or an industry organization).

### 5.5.3 The benchmarking process

Benchmarking is a tough process that needs a lot of commitment within the organization in order to succeed. More than once a benchmarking project will come to an abrupt end due to allegations by staff that the company identified to measure against is different from the company being benchmarked, or in some cases sensitivity towards competition prevents the free flow of information that is necessary for the process to succeed. However comparing performances and processes with "best in class" is essential and should ideally be done on a continuous basis. By the time that the measured company's standards are on par, the competition might be a further few steps ahead (valuebasedmanagement.net).

According to the website valuebasedmanagement.net, benchmarking models involves the following steps:

- Defining the scope
- Choose benchmark partner(s)
- Determine measurement methods, units, indicators and data collection methods
- Data collection
- Analysis of the discrepancies
- Present the results and discuss the implications/improvement areas and goals
- Make improvement plans or new procedures
- Monitor progress a plan ongoing benchmarking.

#### **5.5.4 Cost of benchmarking**

The benchmarking process itself also incurs cost during its execution. Three main types of benchmarking cost is highlighted on the website 12manage.com:

- **Visit costs** – this includes hotel rooms, travelling expenses, meals, token gifts and labour time lost;
- **Time costs** – members of the benchmarking team will be investing time in researching problems, finding exceptional companies to study, visits to these companies and the implementation of the process or identified improvements. This will take them away from their regular tasks for a part of each day so additional staff might be required.
- **Benchmarking database cost** - Organizations that put benchmarking into place in their daily procedures, might find it useful to create and maintain a database with standards of best practices and the companies associated with each best practice.

#### **5.5.5 Benefits and limitations of benchmarking**

The benefits of benchmarking are listed on valuebasedmanagement.net as well as in BBP Business Strategy (2004:233):

- Benchmarking improves communication and the sharing of information can trigger innovation;
- It professionalizes the organization or processes;
- Used when evaluating the possibility of outsourcing;
- Can be used when building improvement into the annual budget;
- To establish the company's position audit: Benchmarking can assess a firm's existing position and provide a basis for establishing standards of performance.

Some of the limitations of benchmarking include the following (valuebasedmanagement.net):

- Benchmarking is a tough process that needs a lot of commitment to succeed.
- The process is time-consuming and there are several costs involved (see 5.4.4)
- The company or business unit is not always comparable in strategy, size, model, culture.

- Will the benchmarked practice really improve the success of the target company?  
Are these organizations comparable in strategy, size, model, culture?

## **5.6 THE BALANCED SCORECARD**

### **5.6.1 Defining the balanced scorecard**

Another way of measuring performance is by making use of the Balanced Scorecard. The balanced scorecard translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for implementing its strategy. The balanced scorecard focuses on achieving financial objectives and it also highlights the non-financial objectives that an organization must achieve in order to meet its financial objectives (Drury, 2004:1001). The information provided in the balanced scorecard may include both financial and non-financial elements and will include topics such as profitability, customer satisfaction, internal efficiency and innovation (BPP Business Strategy, 2004:397)

Garrison *et al.* (2006:449) states that a balanced scorecard consists of an integrated set of performance measures that are derived from and supports the company's strategy throughout the organisation.

### **5.6.2 The four perspectives of the balanced scorecard**

The balanced scorecard measures a company's performance from four key perspectives (Horngren *et al.*, 2006:459):

- financial,
- customer,
- internal business processes,
- learning and growth.

**Financial perspective:** the profitability of the strategy is evaluated.

**Customer perspective:** the target market segments are identified and the company's success in these segments is measured.

**Internal business processes perspective:** This perspective focuses on internal operations that further both the customer perspective by creating value for customers and the financial perspective by increasing shareholder wealth.

**Learning and growth perspective:** the capabilities in which the organization must excel in order to achieve superior internal processes that creates value for the customers and shareholders.

### **5.6.3 Pitfalls when implementing a balanced scorecard**

Homgren *et al.* (2006:463) identified pitfalls which can be encountered when implementing a balanced scorecard:

- Don't assume the cause-and-effect linkages to be precise. A critical challenge is to identify the strength and speed of the casual linkages among the non-financial and financial measures.
- Don't seek improvements across all of the measures all of the time.
- Don't use only objective measures in the scorecard (Objective measures include operating income from cost leadership, market share and manufacturing yield). It should also include subjective measures such as customer and employee satisfaction ratings.
- Don't fail to consider both costs and benefits of initiatives such as spending on information technology and research and development before including these objectives in the scorecard.
- Don't ignore non-financial measures when evaluating managers and employees.

## **5.7 SUMMARY**

Performance measurement is concerned about communicating the financial and non-financial goals and objectives of the company to all the employees and stakeholders of the organization. Various techniques, with special reference to the balanced scorecard and benchmarking were discussed in this chapter that will assist managers to establish whether the business unit or department's objectives have been met.

## **CHAPTER 6: METHOD OF RESEARCH**

### **6.1 FIELD OF RESEARCH**

The application of cost accounting techniques, with special reference to cost management and performance measurement will be evaluated at the transport services department of Company A.

### **6.2 METHOD OF INVESTIGATION**

The methods of investigation used in this research were as follows:

#### **6.2.1 Literature study**

A literature study was conducted on the topic of several management accounting techniques. Sources include a wide range of internet and magazine articles to ensure that the literature study is relevant to current situations and is supported by academic sources from text books.

#### **6.2.2 Empirical study**

A structured interview was held with the senior plant management officer, the planning department and the foremen in charge of the different sections at this department.

Information was also gathered through observing daily activities in the department and the correct application of relevant cost management techniques in the workplace.

### **6.3 DESCRIPTION OF INTERVIEWS**

Interviews were held with the following persons:

- The senior plant maintenance (PM) officer: A structured interview was held in order to ensure that the information extracted from the plant maintenance system

is used in the correct context. The information provided by the PM officer was used in the empirical study.

- The foremen in the different sections: in order to draw conclusions after the empirical study was conducted.
- The transport manager: Informal conversations were held with the manager of the department regarding various issues, but more specifically about his view on performance measurement.

The information provided by the interviewed people were taken into account when extracting the data and analysing it in order to make recommendations.

#### **6.4 DESCRIPTION OF RECORDS USED**

The financial records of the transport department were analysed.

Company A makes use of the SAP system for their financial records. The maintenance module of SAP is used to a greater extent at this specific department.

The transport department makes use of the Micro-alert system to manage fuel transactions. Once a vehicle is purchased, it is registered onto the maintenance system and a fuel barcode is issued for that specific vehicle which entitles the driver of the vehicle to refill the vehicle at a fuel pump on the premises of Company A. After the vehicle is refilled with fuel, the pump attendant will scan the barcode and the transaction is recorded onto the Micro-alert system. The vehicle's kilometre or hour reading is also logged onto this system.

At the end of each day, all the transactions that were recorded on the fuel system interfaces to the costing system on SAP. It is then possible to trace the kilometre reading, fuel consumption as well as the fuel cost relating to each vehicle.

The plant maintenance system will flag the PM officers once a vehicle is due for a service. Even these transactions are recorded onto the system. This makes it possible to



establish how much money the company spends on its maintenance per vehicle or vehicle type.

Other data is also stored on this system, such as breakdowns or accidents. A "breakdown" can be defined as urgent work that needs to be conducted as soon as possible due to possible production losses. Work done on ambulances are always treated as breakdowns, due to the fact that peoples' lives might be at stake while the ambulance stands for a service or repair.

The information captured onto the system also enables the pm officers to draw interesting reports, such as "amount of breakdowns versus planned work".

## **6.5 SUMMARY**

This study was conducted on the basis of extracting information from the system currently in use at the transportation department of Company A and by using a questionnaire in order to gain an understanding of the operations under scrutiny.

## **ADDENDUM: QUESTIONNAIRE**

**QUESTIONNAIRE USED TO CONDUCT A FORMAL INTERVIEW**

**PERSON BEING INTERVIEWED:** Senior plant maintenance officer

**QUESTIONS:**

1. What is your position in this department?
2. How many years of experience to you have in the field of plant maintenance?
3. What are your responsibilities?
4. What system do you use in order to record your maintenance requirements?
5. Do all the work that the workshops conduct, get recorded onto this system?
6. Is it possible to view fuel transactions relating to specific vehicles over a certain period?
7. Do you keep logbooks for each vehicle to record their kilometres, or hours, travelled?
8. How much "planned work" do you do as opposed to "breakdown" work?
9. What is the process flow from when a maintenance requirement arises until it is solved and carried out?
10. What, in your opinion, are the main benefits from using a plant maintenance system?

## **CHAPTER 7: EMPIRICAL RESEARCH DONE AT THE TRANSPORT SERVICES DEPARTMENT**

The information relating to the internal operations of Company A and used in these calculations was sourced from the plant maintenance system as well as accounting records of Company A. Due to the sensitive nature of the information, only total figures were used and no detail was provided in these calculations. The information that relates to external activities, were sourced from magazines and from consultations with potential external service providers.

The information is accurate and changes in the operations will have no fundamental effect on the data used.

### **7.1 Investigating the possibility of outsourcing the transportation of employees**

The total fleet of 47 buses is currently employed to transport mine employees between their work place and the hostels on a daily basis. Based on the amount of shifts worked in a twenty four hour day as well as the amount of people, an estimated quantity of 80 trips is being done by these buses.

There are several costs involved in this transportation process, such as diesel, maintenance cost, tyre cost, labour cost of drivers and supervisors as well as the added risk of damage to the vehicles. 60 Bus drivers are currently employed by Company A.

It is necessary to investigate the possibility of outsourcing this transport service provided by the bus operators, because it might result in a reduction of total cost and risk to Company A. The M Bus Service company is a company that specializes in renting buses out. They conduct all the maintenance on the buses. Company A will however be held responsible for malicious damage to these vehicles as well as for the fuel to run the buses. The fuel expenses are an irrelevant cost, because Company A will be responsible for payment irrespective of the outcome of the exercise.

Data considered:

**Company A:**

- Annual maintenance cost of bus operations: **R 23,159,215;**
- The above amount excludes property damages;
- The above amount includes additional non-production trips such as sport trips and transporting people in an event of funeral;
- The stated amount includes all the drivers' and supervisors' labour cost.
- Amount of buses: 39 (33 will be utilized at any given moment. The rest will be serviced at the garage)
- Buses are operational on 330 days per annum.

**Total cost of bus operations per bus per day to Company A: R1,799**

**Outsourcing the bus operations to M Bus Service:**

- The buses will be hired for 330 days of the year;
- Only 33 buses will be needed (M Bus Service is responsible for the servicing of these vehicles and has to provide 33 buses at any given time.);
- No additional trips are done by the sourced company. Additional buses have to be hired in to cover these trips;
- Labour cost of 4 supervisors to oversee the outsourced function: R400,000 per annum.
- Rental cost per bus per day: **R2,600**

**Total cost of bus operations if outsourced to M Bus Service per bus per day: R2,600**

If the supervisor's salaries are added to this calculation, it would add a further R1,282 per day to the calculation.

The in-house operated buses of Company A run at a lower rate per day than what it would be if it is outsourced. It is recommended that Company A continues to maintain its own fleet of buses.

The labour cost of the Severance packages will have to be paid out to existing bus drivers which might also lead to a negative attitude towards Company A.

## **7.2 Investigating the possibility of outsourcing the Road Repairs Crew**

The main purpose of the road repairs crews is to maintain the roads up to a certain standard. This includes pothole repairs, repainting of lines on the road where it faded, erection of speed humps, putting up traffic signs and cutting of grass near the shoulders of the road. To measure the performance of these crews is not an easy task, because all of these tasks are done when they become necessary.

Company E is a BEE (Black Economic Empowerment) company that specializes in the maintenance and upkeep of roads. If they repair the roads, it is estimated that their material cost will be the same as those of Company A. Company E, however, charges a 10% handling fee on all materials used. They will be employing 6 people (including a supervisor).

Cost comparison based on annual figures. (Company A vs. Company E):

### **Company A**

Labour cost:	R1,000,000 (12 employees)
Materials cost:	R 360,000
Overheads:	R 16,000
Maintenance cost to LDV, 2 trailers and 2 cab star vehicles	<u>R 48,000</u>
<b>Total Annual cost</b>	<b><u>R1,424,000</u></b>
<b>Cost per month</b>	<b>R 118,667</b>

### **Company E**

Labour cost (included foreman from Company A to oversee)	R 320,000
Materials cost:	R 360,000
Handling fee (10%)	R 36,000
Overheads	R 60,000
Ldv (wet rate – fuel cost is for Company E's account)	<u>R 60,000</u>
<b>Total Annual cost</b>	<b><u>R 836,000</u></b>
<b>Cost per month</b>	<b>R 70,000</b>

There will be a cost benefit to Company A if the road repairs function is outsourced to Company E. One other alternative is to take a close look at the actual labour

requirements of this function. If Company A decides that only 6 employees is adequate to carry out the function and keeping up the road standards, the monthly cost to Company A will be reduced by R60,000. No overtime or bonus payments are taken into account in the calculations.

One important cost aspect that needs to be considered is the retrenchment packages that have to be paid out to the employees that are laid off if Company A decides to outsource the road repairs function.

### 7.3 Hire versus purchase

The possibility of hiring forklifts in stead of purchasing and maintaining them is also an area that needs to be investigated in order to ensure that Company A uses the cheapest option.

The majority of the work is done by making use of the 4 ton rough terrain forklift. The price of hiring such as a forklift will be R5,446 per month. The current purchase price of the same forklift is R304,000.

If the forklift is hired, it will be hired on a dry contract, which means that Company A will be responsible for the fuel cost. The cost of fuel is thus irrelevant in this exercise. Forklifts are written off over a period of 10 years. Company A uses a cost of capital of 15% which represents a risk adjusted rate.

The exercise will be carried out by making use of the NPV and IRR calculations:

Information available:

Forklift:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
	R	R	R	R	R	R
Saving on rental cost		65,352	65,352	65,352	65,352	65,352
Tyres		-	(5,900)	(5,900)	(5,900)	(5,900)
Maintenance / repair cost		-	(25,000)	(25,000)	(25,000)	(25,000)
Fuel cost		-	-	-	-	-
Increase in working cost		-	(30,900)	(30,900)	(30,900)	(30,900)

### Net Present Value (NPV) & Internal Rate of Return (IRR) calculation:

	Year	Capital Expenditure R	Saving in rental cost R	Increase in working cost R	Net Cashflow R	Tax @ 30 % R	Net Cashflow after Tax R
2006	0	-244,000			-244,000	73,200	-170,800
2007	1		65,352	-30,900	34,452	-10,336	24,116
2008	2		65,352	-30,900	34,452	-10,336	24,116
2009	3		65,352	-1,000	64,352	-19,306	45,046
2010	4		65,352	-1,000	64,352	-19,306	45,046
2011	5		65,352	-1,000	64,352	-19,306	45,046
2012	6		65,352	-1,000	64,352	-19,306	45,046
2013	7		65,352	-1,000	64,352	-19,306	45,046
2014	8		65,352	-1,000	64,352	-19,306	45,046
2015	9		65,352	-1,000	64,352	-19,306	45,046
2016	10		65,352	-1,000	64,352	-19,306	45,046
<b>TOTAL</b>		<b>-244,000</b>	<b>653,520</b>	<b>-69,800</b>	<b>339,720</b>	<b>-101,916</b>	<b>237,804</b>

NPV @ 15%                      R18,479

IRR                                      17.83%

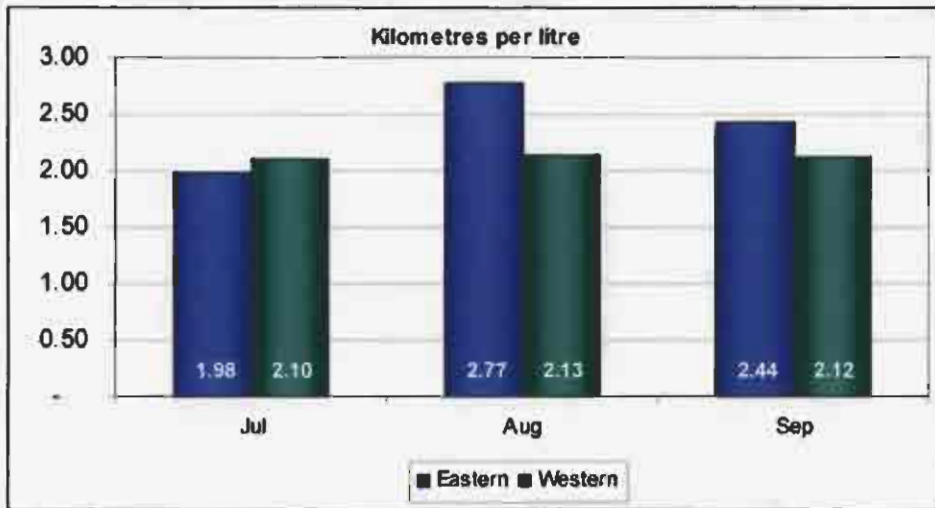
#### 7.4 Benchmarking maintenance cost: Eastern versus Western buses maintenance

All the required information was extracted from the plant maintenance system of Company A for the period July to September 2006. The senior planning officer of the transport service department was also consulted in order to ensure that the data is utilized in the correct context.

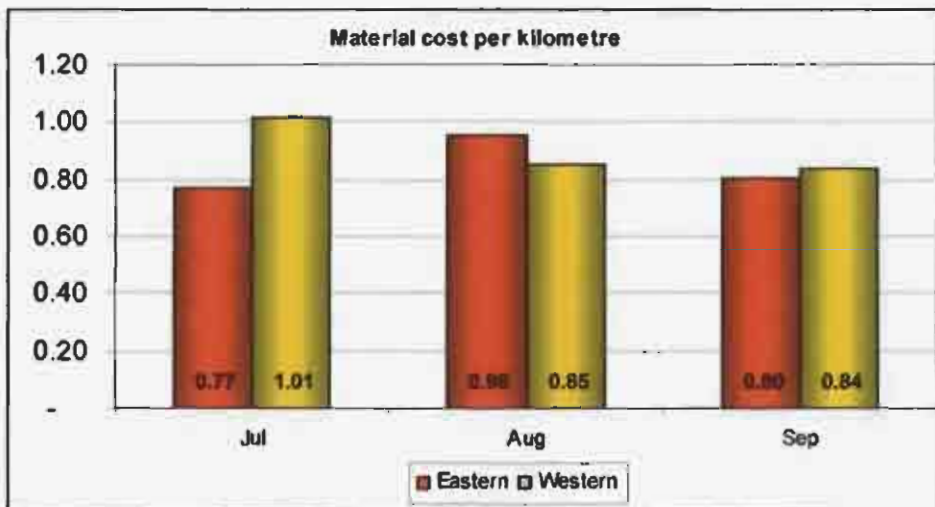
	Eastern	Western
Total cost of services	R155,865	R101,396
Cost of additional repairs	R 51,955	R 33,797
Cost of tyres replaced	R 45,421	R 62,520
Total cost of fuel	R865,329	R567,872
Kilometres travelled	299,625 km	221,590 km
Number of buses	22 buses	20 buses

The fuel efficiency of the two groups of buses can now be calculated, as well as the material cost per kilometre:





**Graph 6.1: Kilometres consumed per one litre of fuel**



**Graph 6.2: Material cost per kilometre travelled**

On average the Western bus group reveals a better fuel efficiency than the Eastern bus group. However, the materials cost per kilometre of the Western bus group is higher than those of the Eastern group.

All of the items that were purchased for conducting the services were investigated in order to establish why the maintenance cost of the Western bus group is so much higher. More brake drums were replaced during the services on the western buses, mainly due to the higher amount of speed humps and stop streets on the western side of the mine.

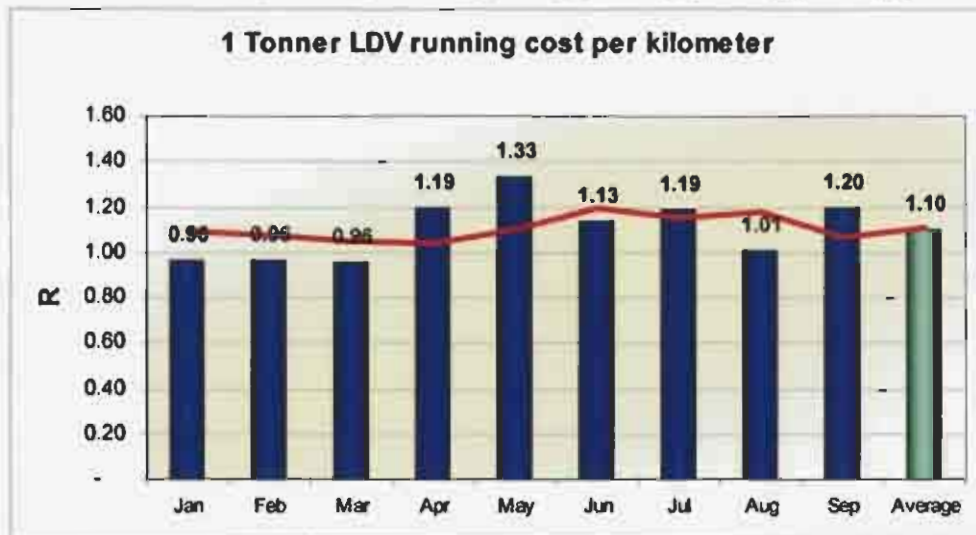
## 7.5 Benchmarking the running cost of vehicles

It is possible to benchmark the LDV's and the kombi's against the running cost rates of the Automobile Association (AA). This is the best benchmark rate to use in order to establish whether the vehicles are performing at an optimum efficiency level.

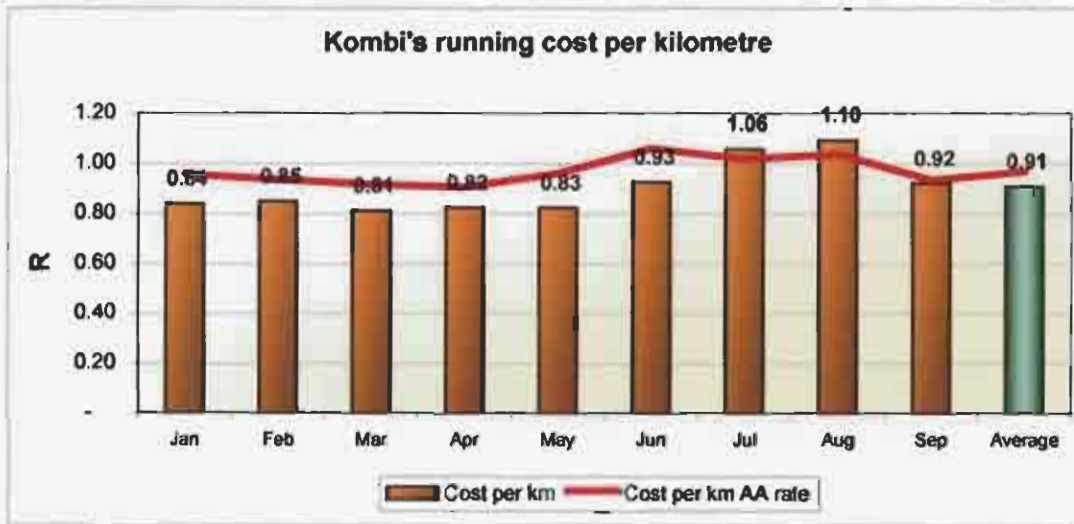
The first step in the process will be to define the term "running cost". The Proudfoot Consulting firm (2001:14) defines the running cost of a vehicle as the sum of all fuel cost, tyre cost, and cost of services as well as repairs to the vehicles. The running cost excludes malicious damage to vehicles.

Data was extracted from the available accounting system and the plant maintenance system of company A for the period January to September 2006.

<u>1 Tonner LDV's</u>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
Cost of services & repair	23,266	70,294	26,125	58,088	59,554	29,278	48,355	53,204	83,258	
Fuel cost	108,986	108,482	103,296	101,197	132,825	149,935	145,563	141,739	125,920	
Tyre cost	3,583	4,358	11,766	10,470	9,472	7,391	8,062	13,579	6,811	
<b>Total cost</b>	<b>135,835</b>	<b>183,134</b>	<b>141,187</b>	<b>169,755</b>	<b>201,851</b>	<b>186,604</b>	<b>201,980</b>	<b>208,522</b>	<b>215,989</b>	
Kilometers	140,924	190,578	147,310	142,096	151,493	164,749	170,238	206,916	180,679	
Fuel cost per litre	5.47	5.28	5.09	5.00	5.51	6.46	6.06	6.26	5.25	
Calculating AA rate (excluding VAT):										
Fuel Factor x fuel cost	0.58	0.56	0.54	0.53	0.58	0.69	0.64	0.66	0.56	
Maintenance cost	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	
Tyre cost	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	
<b>1 Tonner LDV's</b>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Average
Cost per km	0.96	0.96	0.96	1.19	1.33	1.13	1.19	1.01	1.20	1.10
AA rate	1.09	1.07	1.05	1.04	1.10	1.20	1.16	1.18	1.07	1.11



<b>Kombi's</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	
Cost of services & repair	8,426	13,365	3,627	6,152	6,848	19,942	2,712	7,369	6,648	
Fuel cost	109,921	148,651	114,902	110,835	118,165	128,504	30,213	25,786	21,697	
Tyre cost	-	-	1,213	-	-	4,215	6,057	1,223	-	
<b>Total cost</b>	<b>118,347</b>	<b>162,016</b>	<b>119,742</b>	<b>116,987</b>	<b>125,013</b>	<b>152,661</b>	<b>38,982</b>	<b>34,378</b>	<b>28,345</b>	
<b>Kilometers</b>	<b>140,924</b>	<b>190,578</b>	<b>147,310</b>	<b>142,096</b>	<b>151,493</b>	<b>164,749</b>	<b>36,818</b>	<b>31,375</b>	<b>30,756</b>	
Fuel cost per litre	5.47	5.28	5.09	5.00	5.51	6.46	6.06	6.26	5.25	
<b>Calculating AA rate (excluding VAT):</b>										
Fuel Factor x fuel cost	0.57	0.55	0.53	0.52	0.58	0.68	0.64	0.66	0.55	
Maintenance cost	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	
Tyre cost	0.18	0.18	0.18	0.18	0.18	0.18	0.16	0.18	0.18	
<b>Kombi's</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Average</b>
Cost per km	0.84	0.85	0.81	0.82	0.83	0.93	1.06	1.10	0.92	0.91
AA rate	0.96	0.94	0.92	0.91	0.96	1.06	1.02	1.04	0.93	0.97



## **7.6 Vehicle Replacement**

The purpose of vehicle replacement is to upgrade the vehicle fleet in order to meet business needs in a cost effective manner by reducing maintenance cost by the replacement of vehicles that have exceeded their expected operational life span.

The Transport department of Company A has an amount of R5,500,000 available to purchase new vehicles for the coming financial year. A number of vehicles have already been identified to be replaced such as buses, front end loaders, teleloggers and kombi's.

The following information is available:

The weighted average cost of capital used by Company A to evaluate their projects is 15%.

- Vehicles identified to be replaced will be sold on an auction.
- The "cost to repair" is the estimated amount that will be necessary in order to repair the vehicles to an acceptable standard. The "cost to repair" is based on the mechanics in the garage's observations and estimations.
- The maintenance cost is the estimated annual amount that has to be spent on the vehicles. The maintenance cost will increase by 10% per annum due to annual deterioration of the vehicles.

Vehicle Type	Registration	Age Years	Estimated annual maintenance cost	Cost to repair	Possible Income from auction
			R	R	R
<b>Buses</b>	1 CLM813NW	24	32,790	137,500	40,000
	2 BBH273NW	21	24,020	112,000	60,000
	3 CNN717NW	21	52,233	108,750	60,000
	4 DGV186NW	21	25,126	128,500	60,000
	5 CJB121NW	20	46,680	192,150	62,000
	6 CJB100NW	20	20,113	122,100	62,000
	7 BBH276NW	16	26,969	388,900	65,000
	8 DGV202NW	16	30,464	181,580	65,000
	9 CMY361NW	16	17,923	150,000	65,000
	10 DFS429NW	11	48,897	122,550	85,000
			<b>325,216</b>	<b>1,644,030</b>	<b>624,000</b>
<b>Combi's</b>	1 DLL168NW	3	17,546	27,930	40,000
	2 DCV583NW	4	12,190	27,110	30,000
	3 DKZ710NW	3	9,513	27,240	40,000
	4 BJL731NW	5	16,478	28,910	16,000
			<b>55,727</b>	<b>111,190</b>	<b>126,000</b>
<b>Teleloggers</b>	1 TEL033-2GS	18	12,451	250,000	50,000
	2 TEL032-12GS	11	88,909	236,900	75,000
			<b>101,360</b>	<b>486,900</b>	<b>125,000</b>
<b>Front end loaders</b>	1 TEL017GS	12	33,598	304,000	120,000
	2 CHZ413NW	12	51,432	296,630	120,000
			<b>85,029</b>	<b>600,630</b>	<b>240,000</b>
<b>TOTAL</b>			<b>567,332</b>	<b>2,842,750</b>	<b>1,115,000</b>

**Maintenance Cost:**

Assuming maintenance cost will increase by 10% per annum due to deterioration in the equipment standard:

<b>Year 1</b>	567,332
<b>Year 2</b>	624,065
<b>Year 3</b>	686,471
<b>Year 4</b>	755,118
<b>Year 5</b>	830,630

**Net Present Value (NPV) & Internal Rate of Return (IRR) Calculation:**

Year	Capital Expenditure R	Saving on cost to repair R	Maintenance Cost Saving R	Net Cashflow R	Tax @ 30 % R	Net Cashflow after Tax R	
2006	0	-5,500,000		-5,500,000	1,650,000	-3,850,000	
2007	1	1,115,000	2,842,750	587,332	4,525,082	-1,357,525	3,167,557
2008	2			624,065	624,065	-187,219	436,845
2009	3			686,471	686,471	-205,941	480,530
2010	4			755,118	755,118	-228,536	528,583
2011	5			830,630	830,630	-249,189	581,441
2012	6						
<b>TOTAL</b>		<b>-4,385,000</b>	<b>2,842,750</b>	<b>3,463,617</b>	<b>1,921,367</b>	<b>-576,410</b>	<b>1,344,957</b>
<b>NPV @ 15%</b>		<b><u>R123,452</u></b>					
<b>IRR</b>		<b><u>17.42%</u></b>					

**7.7 The Balanced Scorecard**

The performance of the Transport Services Manager as head of the section should be measured on a bi-annual basis in order to evaluate his abilities to manage and his dedication towards the success of the business as a whole. In conjunction with the Manager, a balanced scorecard was drawn up in order to facilitate him in measuring his actual performance against set targets.

**FINANCIAL PERSPECTIVE:**

Key Performance Areas	Objectives	Measures
Departmental Cost	Contain costs within the 2006 Business Plan in respect of Working Costs & Capital Costs	Business Plan as well as forecasted figures.
<b>Initiatives</b>	<ul style="list-style-type: none"> <li>To strive towards a 5% saving on a year on year basis.</li> <li>Introduction of new technology to ensure that the correct equipment is purchased and maintained.</li> </ul>	

### CUSTOMER PERSPECTIVE:

Key Performance Areas	Objectives	Measures
<p>Customer service management</p> <p>Business plan tons transferred to plant</p> <p>Safe delivery of employees to and from working place</p> <p>An acceptable availability of a roadworthy fleet</p> <p>Maintaining the road infrastructure to ensure safe travelling of employees to and from work</p>	<ul style="list-style-type: none"> <li>To empty reef and opencast product on a weekly / monthly basis.</li> <li>To ensure employees are delivered and collected from the workplace in a safe manner and on time.</li> <li>To ensure the vehicle fleet is available and roadworthy so as to ensure that Company A's Business plan is met.</li> <li>To ensure that maintenance of Road and Rail is of a high standard.</li> </ul>	<ul style="list-style-type: none"> <li>Daily, weekly &amp; monthly tonnage reports.</li> <li>Daily trip logs feedback from different Departments &amp; HR personnel.</li> <li>Daily and monthly plant maintenance reports.</li> </ul>
<b>Initiatives</b>		
<ul style="list-style-type: none"> <li>Proper trip planning and instruction.</li> <li>Advanced driver training.</li> <li>Advanced Engineering training.</li> <li>Correct use of new technology.</li> </ul>		

### INTERNAL PROCESS PERSPECTIVE:

Key Performance Areas	Objectives	Measures
<p>Safety Management</p> <p>Business planning</p> <p>Plant Maintenance</p> <p>Communication</p>	<ul style="list-style-type: none"> <li>Shifts lost due to injured employees.</li> <li>Ensuring Business plan forecast is met on monthly basis.</li> <li>Ensure that all vehicles are maintained in accordance with standard procedures</li> <li>Ensure that all Transport employees are informed of all new developments within Company A and within the Transport Department.</li> </ul>	<ul style="list-style-type: none"> <li>Daily, weekly &amp; monthly safety statistics.</li> <li>Weekly, monthly Business Plan reports.</li> <li>Plant maintenance reports</li> <li>Communication Department audits.</li> </ul>

<b>Initiatives</b>
<ul style="list-style-type: none"> <li>• Proper accident/incident investigations to determine correct remedial action.</li> <li>• Proper policy implementation, promotion and support.</li> <li>• To promote merit award systems within the Transport Department.</li> <li>• To ensure that employees understand the importance of Planned Maintenance.</li> <li>• Ensure briefing system works and the distribution of internal newsletter.</li> <li>• Ensure implementation and monitoring of the process.</li> </ul>

**LEARNING, INNOVATION AND GROWTH PERSPECTIVE:**

<b>Key Performance Areas</b>	<b>Objectives</b>	<b>Measures</b>
<b>Individual:</b> Improvement of Management skills  <b>Departmental:</b> To ensure that the Transport employees are educated to a standard that is required by Company A	As per Career Path  As per Career Path	Training and development history  Monthly training reports
<b>Initiatives</b>  Attend technical meeting to improve general knowledge of problem and new ideas around the property.  Ensure that the selection of employees for the specific type of job is correct.		

## **CHAPTER 8: FINDINGS AND RECOMMENDATIONS**

### **8.1 INTRODUCTION**

The application of cost accounting techniques, with special reference to cost management and performance measurement were evaluated at the transport services department of Company A.

### **8.2 FINDINGS**

It is evident that the transport services department currently operates successfully. There are however a few areas that needs to be improved.

- The first investigation that was carried out proved that the current bus operations involving the transportation of employees are the lowest cost option.
- The road repairs section needs attention. The rates at which they currently operate are not market related at all.
- The net present value of the hire versus purchase exercise is positive at R18,479 and the internal rate of return on the investment is 17,83% which is 2,83% higher than the required rate of return on capital projects.
- The busses operating at the Western side of the mine runs at a higher material cost per kilometre than those running at the Eastern side.
- The light duty vehicles (ldv's) are operating at a higher rate than the recommended AA rate.
- The kombi's are operating at a lower rate than the recommended AA rate.



- The vehicle replacement project is a feasible project. It has a positive net present value of R123,452 and an internal rate of return of 17.42% which is 2.42% higher than the required rate of return on capital investments.

### **8.3 RECOMMENDATIONS**

Based on the findings above, a few recommendations can be made in order to improve the current operating cost of the transport services department of Company A.

#### **Outsourcing the Bus operations**

Company A should keep operating the transportation of employees in-house, because it is more cost efficient and management will have a handle on the drivers.

#### **Outsourcing the Road Repairs function**

It is recommended that the outsourcing of the road repairs section is seriously considered. Company A will incur long term cost benefits from such a major step. It will also be beneficial to employ the expertise of the company that is being sourced.

#### **Forklifts: Hire versus purchase**

It is evident from the calculations done that forklifts should be purchased rather than hired.

#### **Benchmarking the difference in operating cost between the two Garages**

The two foremen of the two garages should swap workplaces and responsibilities for a trial period of a month. The same exercise should then be conducted to see if a change in the management doesn't perhaps make a difference to the high maintenance cost on the buses.

### **Measuring running cost of Idv's and kombi's**

The 1 tonner Idv's are currently operating at a much higher rate than the recommended running cost rate of the Automobile Association. There are two possible reasons for this occurrence:

One being that the drivers are not caring for the vehicles like they should, or that the vehicles are being over-maintained.

The repair cost to the Idv's was not as high as the service cost. This means that the Idv's are over maintained. It is recommended that the service schedules of these vehicles are reconsidered and extended to have longer intervals between services.

The kombi's operate at a rate lower than that of the recommended AA rate. From the data the assumption can be made that the kombi's are not utilized in the past three months as they used to be. The kilometres that were travelled the last few months were significantly lower than in the months January to June.

### **Vehicle Replacement**

The identified vehicles need to be replaced due to their old age and the high cost of repairing them to a workable standard that will meet legislative standards. The maintenance cost of these vehicles will also increase by a real rate of 10% per annum due to increased maintenance caused by old age.

Company A will have a great financial benefit when this project is implemented.

### **Balanced Scorecard**

The Manager of the transport services department will make use of the implemented scorecard in order to facilitate him and his supervisor in order to measure his performance. All of the previous recommendations will also be incorporated into this scorecard to enable him to ensure that the operation run at an even lower cost.

#### **8.4 SUMMARY**

Certain areas of the transport services department were highlighted that needs to be improved.

However, all of these sections were viewed and assessed independently from each other. Further studies need to be conducted into the feasibility of each of the recommendations before it can be executed, to ensure that Company A is not in a worse position after the implementation of these improvements. Some overhead costs will remain intact and will also have to be considered if the recommendations are to be carried out.

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