MOTIVATION OF SCIENTISTS IN A KNOWLEDGE ORGANISATION FOCUSING ON REWARDS

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DECLARATION

I declare that this research is my own, unaided work. It is submitted in partial fulfilment of the requirements of the degree of Masters of Business Administration of the University of Wales, Cardiff. It has not been submitted before for any degree or examination in any other University.

Padayachy

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EXECUTIVE SUMMARY

The aim of this research study was to understand the needs of knowledge workers and to determine if the current reward system is appropriate to promote the objectives of a knowledge intensive organisation. The objectives of this study were to identify factors that motivate and satisfy knowledge workers, to determine if monetary or non-monetary reward is of greater value, to establish the benefits and shortcomings of the existing reward system in the organisation and to recommend changes to the reward system within a knowledge organisation.

CSIR's competitive advantage is based on a knowledge intensive organisation which includes factors like innovation, technology, research and development through the competencies and capabilities of their scientists. In order for CSIR to retain and utilise its intellectual capital optimally, management needs to understand scientists in context of a knowledge organisation. Rewards, recognition and performance management plays a central role in the retention and utilisation of these knowledge workers.

A detailed literature review regarding knowledge worker behaviour, knowledge organisations, performance management, motivation and rewards is presented in this research. The literature was used to develop a questionnaire and validate the findings of this research. The research design followed a descriptive approach. A questionnaire was formulated in order to obtain data from the scientists. 80 Scientists were contacted to participate in this study from three business units of the CSIR. The questionnaire covered demographic data, job satisfaction, value of monetary and non-monetary reward, shortcomings of the existing reward system and recommendations leading to the improvement of the reward system.

The research findings are presented and summarised. 58% of the scientists responded to the questionnaire. Majority of the scientists involved in this research are from Bio/Chemtek and fall into the 30-39 age group. They are predominantly male and of the white group. Majority of the scientists have a PhD qualification with 3-10 years of work experience.

From the research findings, it is clear that the scientists obtain satisfaction from their jobs. Satisfaction is mainly derived from the research and innovation component of the work. Monetary reward is evaluated to be of greater value than non-monetary reward, including salary increases, bonuses for outstanding publications and patents, profit sharing, and merit bonuses. Non-monetary reward is also considered to be important and these include career advancement opportunities, additional technical support (equipment, funding, net-working) and studies (graduate, postgraduate).

The scientists have shown that both monetary and non-monetary rewards are beneficial components of the existing reward system. It is clear that the shortcomings of the reward system, is that the system is not effectively communicated, the scientists feel that as part of the monetary rewards, good performance is not recognised by management and that there is no recognition for innovation. The scientists suggested significant improvements to the system such as increases in monetary rewards, profit sharing systems, technical rewards based on innovation, team bonuses and clear goals during the performance management process. It is clear from the research findings that the reward system needs improvement.

Recommendations to improve the reward system were made using the research findings. The literature study was used to validate the research findings where possible. The researcher recommended that an innovative strategy needs to be implemented within the context of a knowledge organisation. An award programme which will recognise innovations is recommended. Management needs to address the manner in which performance management is performed especially, training and development of employees in the performance management process. Team bonuses, the leadership of knowledge workers and a communication strategy is recommended. An increase in the value of monetary reward for scientists and a conducive working environment are also recommended.

In conclusion, performance management, knowledge management and rewards can not be viewed as isolated elements. They all play an integral role in producing an effective reward system in a knowledge organisation. Management needs to consider the recommended changes in a holistic manner to improve the system thus enabling the retention of its intellectual capital.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

As a uniquely South African organisation, the Council for Scientific and Industrial Research (CSIR) is committed to innovation. The CSIR supports sustainable development and economic growth in the context of national priorities and global challenges. The organisation creates value for clients, partners and stakeholders by providing technology solutions, information, establishing ventures and licensing intellectual property. (www:a)

CSIR's strategy is to accelerate the organisation to a Knowledge Intensive Technology Organisation (KITO) which contributes to the African Renaissance, and is both internationally competitive and regionally relevant. In positioning itself as a leading knowledge and technology solution provider, the CSIR's goal is to create a world-class alliance. In doing so this will have the critical mass to compete globally in science and technology; offer opportunities to attract and retain the best people, reinforce and support the objectives of the national system of innovation and create a globally effective flagship for South Africa. (www:a)

In order to move towards a knowledge intensive organisation the CSIR's strategy is to manage and empower knowledge workers who have strong commitment, loyalty and ownership, to create a culture of trust, sharing, collaboration and manage diversity. Diversity management as an inclusive strategy is aimed at all employee groups in the CSIR with a special focus on knowledge workers. (www:b) Diversity represents the multitude of individual differences and similarities that exist among people (Kreitner, Kinicki & Beulens, 1999:31). Reward, recognition, performance measurement, appropriate behaviour by managers/leaders and staff are characteristics towards a knowledge intensive organisation. (www:b)

The CSIR's strategic business units are responsible for its research, development and implementation activities that provide technology solutions and information across a broad range of technologies, such as aeronautical systems, building, communication, development, food, information, infrastructure, manufacturing, materials, mining, textiles and the environment. These business units operate under the leadership of a Director and localised management teams.

These business units are self-standing self-financed structures. The business units need to align with and appropriately respond to CSIR's strategy. They have to respond to targets set in the business plan by achieving external income targets, cost reduction plans, plans for achieving transformation targets and employee satisfaction. These business units deliver specialised consulting, technical and information services. They support prototyping and pilot-scale manufacturing (industrialisation/ commercialisation), systems engineering, technical surveys, audits software and decision support. They also support policy development nationally.

These strategic business units are:-
Food, Biological and Chemical Technologies (Bio/Chemtek), Building and Construction Technology (Boutek), Defence Technology (Defencetek), Water, Environment and Forestry Technology (Environmentek), Manufacturing, Materials and Textile Technology (M&Mtek), Information and Communications Technology (*i*comtek), Mining Technology (Miningtek), Roads and Transport Technology (Transportek). The study focuses on Bio/Chemtek, Environmentek and Miningtek.

CSIR is an output driven organisation which functions within the context of a flat management structure to deliver the outputs required from projects to clients. **Flat organisation structures** are essentially the result of following the organic model or approach to organisation design that emphasises aspects like the importance of high levels of adaptiveness, responsiveness and development through limiting the use of rules, regulations and procedures. There is a great deal of decentralisation with resultingly few layers of management levels (Gibson, Ivancevich & Donnelly, 1994:538).

CSIR strives for both business and technical excellence, both goals being of equal value and importance. To ensure the long-term development and growth of the CSIR both business and technical excellence is managed, measured and improved. The measurement and recognition of individual technical and business performance is measured by means of a 4-stage career framework. (www:c)

The 4-stage framework proposes that knowledge workers move through four distinct stages in their career development. Each stage requires psychological shifts, new perceptions of self and new pressures. When one's physiological needs are relatively satisfied, one's safety needs emerge, and so on up the need hierarchy. Once a need is satisfied it activates the next higher need in the hierarchy, according to Maslow's need hierarchy theory (Kreitner, *et al.*, 1999:185). New perceptions of self include internal and mental states such as self-liking, autonomy, achievement, as well as external factors such as needs relating to status, recognition and attention (Swanepoel, Erasmus, van Wyk & Schenk, 2000:356). New pressures include adapting to industry or market changes and challenges at the workplace.

The framework assumes that satisfaction of one stage is required before the individual seeks to move onto the next stage. This concerns the need to become what one is capable of becoming and includes needs relating to growth and development, achieving one's potential and self-fulfilment (Swanepoel, *et al.*, 2000:356). It also acknowledges that not all individuals move through all four stages and that many will of choice be comfortable to remain at a particular stage due to self-fulfilment. People have different needs and are therefore motivated by different things: what acts as a motivator for one person may be totally ineffectual for another, or what is an effective motivator for a person at one time may not be effective on another occasion according to Maslow's theory.

Stage I comprises researchers, scientists, engineers, technologists and lab assistants whose primary role is helping others complete projects or assignments. Stage II comprises an area of specialisation, e.g. Polymer Scientist, whose primary role is to provide technical expertise and professionalism. Stage III comprises specialists whose primary role is to guide, develop and interface large projects. Stage IV

comprises CSIR Fellows and Divisional Fellows whose primary role is shaping organisation direction. (www:c)

The scientists contribute and add value to the organisation. CSIR is able to strive towards innovation, technology, research and development through the competencies and capabilities of their scientists. The scientists hold intellectual material, knowledge, information, intellectual property and experience that can be put to use to create wealth. They form the core part of the organisations existence.

It is imperative that CSIR attracts and retains its scientists. If this intellectual capital is not nurtured by appropriate rewards and remuneration, this can have a detrimental effect on CSIR's business. Dr Sibusiso Sibisi, President and CEO of CSIR, states in his report on "Early Reflections on the CSIR": " I have gained the distinct impression that much of the high quality work at CSIR is conducted by surprisingly small teams of people. The loss of a very modest number of people can wipe out a whole competence at a stroke." (www:d)

CSIR's reward system is based on a performance management process. Figure 1.1 represents the performance management process which CSIR implements. The components of this model are explained.

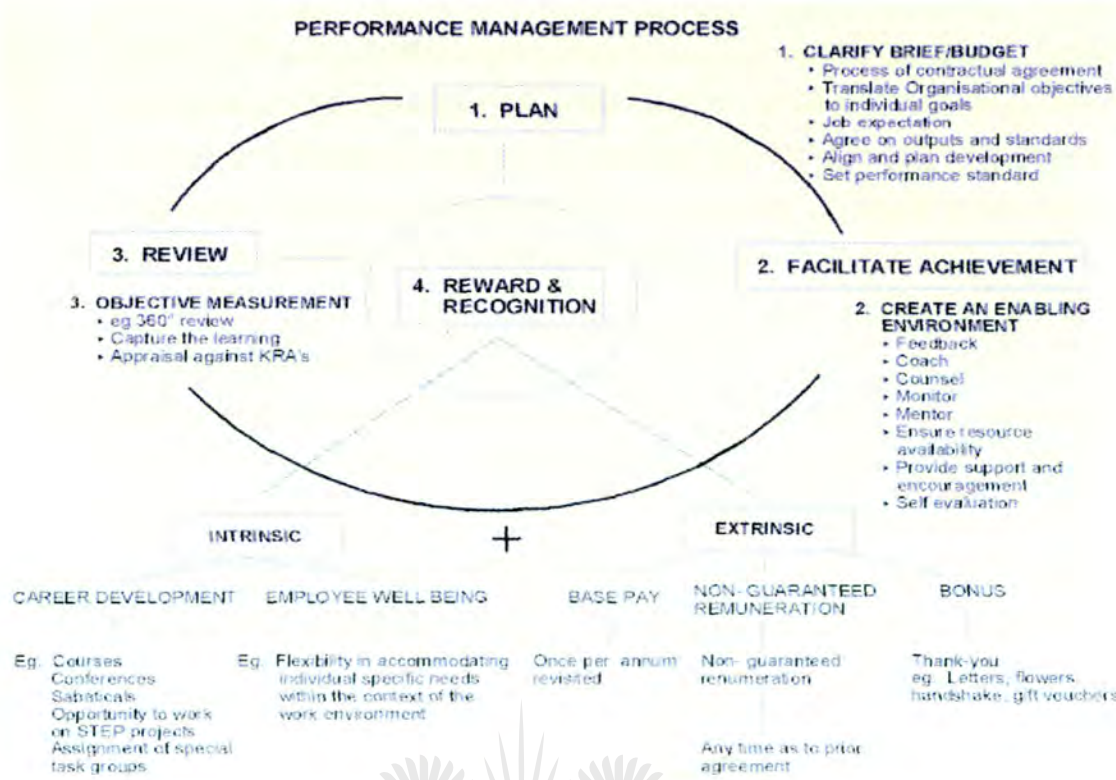

Figure 1.1 CSIR's Performance Management Process (www:e Performance Management Framework and Policy)

Performance management is defined as the management of performance by determining the right outcome, as well as the application, evaluation and rewarding of performance. (www:e)

It is therefore a process that consists of the following phases which occur on an ongoing or specified periods:

1. Planning Phase

   The planning phase is a process of contractual agreement between employees and their managers on the desired inputs and expected outputs and behaviours for the job at hand. Key Result Areas (KRAs) are set which cover all types of work carried out in the Programmeme and support services. The written standardised KRAs are critical and are worded briefly, limited, expressed in output terms and

within the authority level of the employee. Key Performance Objectives (KPOs) are set which is a short concise description of a measurable output, which contributes to the attainment of performance in a KRA. Individual Career Development Plans are set which addresses competencies required for superior performance on the current job and on the future job. Learning opportunities, costs and time frames are agreed upon. (www:e)

2. Facilitate Achievement

Performance management is an ongoing process. Feedback sessions are ongoing to evaluate and facilitate progress. Coaching, counselling and monitoring individual growth are done by a mentor. Support and encouragement is given. Individuals are allowed to evaluate one self. Strengths and areas of improvement are discussed. (www:e)

3. Review

Individual performance is reviewed against KRAs set in the planning stage. The frequency of the review depends on the individual or management. Learning is captured and new KRAs are also set. This review process is normally done by the 360 degree feedback. (www:e) Kreitner, *et al.*, (1999:248) defines **360 degree feedback** as a comparison of anonymous feedback from one's superior, subordinates and peers with self perceptions.

4. Reward and Recognition

A specified percentage of the salary bill is budgeted for rewards and recognition. This percentage differs due to market trends and are based on scarcity of skills, and performance. Staff turnover also has an effect on the percentage of salary allocated. There is a direct relationship between staff turnover and bonuses. Within this process reward and recognition constitutes of intrinsic and extrinsic rewards. The **extrinsic rewards** constitute of a base pay, non-guaranteed remuneration, thank you letters, flowers, gifts and vouchers. The **intrinsic rewards** constitute of career related conferences, courses, sabbaticals, special assignments, overseas exposure, employee wellbeing. (www:e)

Are these rewards suitable for these core scientists at the CSIR? Are CSIR's reward systems appropriately recognising the scientists contribution and value addition to the organisation? The biggest challenge facing organisations today, especially in South Africa, is to adapt to rapid, ongoing change and fierce competition accompanying it. This situation demands that organisations obtain, retain and develop competencies (intellectual capital) that will ensure not only short-term profit and medium-term growth, but most importantly, long-term organisational prosperity (Slabbert, Prinsloo, Swanepoel & Backer, 2000:20-5). Organizational recognition and reward systems are not sufficiently recognising knowledge contributions. They are linked to traditional financial measures (Naidoo, 2002:47).

The challenge for high performance organisations is to design reward systems that both attract and develop the right individuals, and motivate positive performance (Slabbert, *et al.*, 2000:20-11). The knowledge worker, confident of his or her ability, will not tolerate the disrespect of non-recognition in this fiercely competitive global economy, where talent is in high demand. He or she will expect not just monetary rewards, but also spiritual rewards of which acknowledgement and recognition are the most basic. Organisations with credible performance based reward systems will clearly have an advantage in attracting and retaining top performers (Slabbert, *et al.*, 2000:20-29).

This research will be focused on scientists at the CSIR and to understand what is the nature of the present reward system, how effective it is and what should be done to bridge the gap, if any, in order to allow CSIR to have an optimum reward system which will play a major role in the optimum utilization and maintaining of their knowledge workers. This will enable CSIR as a knowledge intensive organisation to explore its knowledge base in accordance with its strategy. In order to do this the concept of knowledge workers will be defined. An understanding of performance management, motivation, and reward systems associated with knowledge workers will also be defined. A questionnaire will be formulated to obtain information in order to understand rewards required by knowledge workers and recommend an appropriate reward system.

1.2 PROBLEM STATEMENT

CSIR's strategy towards a knowledge intensive organisation requires a re-look at reward, recognition and performance measurement within a knowledge intensive organisation perspective. In order to achieve a knowledge intensive organisation an understanding of knowledge workers will be researched. Also, the current reward system will have to be assessed to determine its appropriateness in a knowledge organisation.

1.3 AIM

To understand the needs of knowledge workers and to determine if the current reward system is appropriate to promote the objectives of a knowledge intensive organisation.

1.4 OBJECTIVES

- To identify what motivates and satisfies knowledge workers.
- To determine if monetary or non-monetary reward is of greater value.
- To establish the benefits and shortcomings of the existing reward system in the organisation.
- To recommend changes to the reward system focused at a knowledge organisation.

1.5 DEFINING CONCEPTS

Knowledge workers are defined as people who use their heads more than their hands to produce value. They add value through their ideas, their analyses, their judgement, their syntheses and their designs (Horibe, 1999:xi).

Knowledge is present in ideas, judgements, clients, root causes, relationships, perspectives and concepts. The definition can also include customers, products, processes, culture skills, experiences and know-how (Walters, Feb 2002:44).

Explicit knowledge is knowledge that either is written down in a knowledge base or captured in a formal document, for example a patent (Walters, Feb 2002:44).

Tacit knowledge is the knowledge that is in peoples' brains (Walters, Feb 2002:44).

Motivation is the willingness to do something and is conditioned by this actions ability to satisfy some need of the individual (Robbins, 1994:42).

Performance management can be regarded as an ongoing process that involves the planning, managing, reviewing, rewarding and development of performance (Spangenberg, 1994:29).

Remuneration is usually based on an economically motivated process where certain inputs (physical and mental work behaviour) are exchanged for some outputs (rewards) that are considered to be desirable in satisfying individual needs and goals (Swanepoel, *et al.*, 2000:525).

Financial, material and social rewards qualify as extrinsic rewards because they come from the environment (Kreitner, *et al.*, 1999:250).

Psychic rewards, however, are intrinsic rewards because they are self-granted (Kreitner, *et al.*, 1999:250).

Extrinsic rewards include all rewards an employee gets from sources other than the job itself. An organisation has a large degree of control over the nature and monetary cost of the extrinsic rewards with which it intends to compensate the efforts of its employees and can therefore manipulate the use of these external rewards to affect employee behaviour (Swanepoel, *et al.*, 2000:526).

Intrinsic rewards are self administered rewards that are associated with the job itself, such as the opportunity to perform meaningful work, experience variety and receive feedback on work results (Swanepoel, *et al.*, 2000:526).

1.6 LIMITATIONS

There is limited literature available in the South African context on appropriate rewards and incentives for knowledge workers in knowledge organisations. This study is limited to three of the eight business units within CSIR. Bio/Chemtek, Environmentek and Miningtek have been chosen for this research.

1.7 VALUE OF RESEARCH

The research will enable CSIR to understand the type of rewards needed by knowledge workers, which will ultimately enable them to adapt or change the current reward system for a knowledge organisation. The results of this study may also be valuable to management of any similar organisation considering change to a knowledge organisation.

1.8 METHODOLOGY

1.8.1 Type of Research

Descriptive research, such as that undertaken using attitude and opinion questionnaire and questionnaires of organisational practices, will enable you to identify and describe the variability in different phenomena (Saunders, Lewis & Thornhill, 2000:279). A qualitative survey utilising a descriptive approach will be adopted to satisfy the purpose and aim of this research proposal.

1.8.2 Data Collection

1.8.2.1 Population

The population may be described as the business units within CSIR. These business units are Bio/Chemtek, Environmentek and Miningtek.

1.8.2.2 Sampling and Sampling size

The sample consists of a focused group of scientists at the four different career stages within the CSIR. This involves Bio/Chemtek, Miningtek and Environmentek. There are 20 in Stage I, 20 in Stage II, 20 in Stage III and 20 in Stage IV who will be contacted to participate in this research.

1.8.2.3 Methods used to Collect Data

The data will be collected through the distribution of questionnaires by a web link using electronic mail.

A letter containing the research introduction, purpose of the research along with a questionnaire comprising both open and closed questions will be sent to the three business units. Scientists within the four-stage career framework will be requested to complete the questionnaire. The completion of this questionnaire will be voluntary.

All information and data made available will be treated in the strictest confidence. All references to names will be removed to ensure anonymity and the exclusion of bias in the analysis of the data.

1.8.3 Data analysis techniques

The completed questionnaires will be received on a database created for this study. The data will be analysed to determine the various aspects that each scientist has presented. This data will be presented and compared to available literature where possible.

1.8.4 Validity of Findings

Validity is concerned with whether the findings are really what they appear to be about. Is the relationship between two variables a causal relationship? (Saunders, *et al.*, 2000:101). Robson (1993) describes the threats to validity, which provides a useful way of thinking about this important topic. The history or background of the

research conducted needs to be researched or it could have a dramatic and quite misleading effect on the findings. Other threats to the validity of the research are ambiguity about causal direction or the respondents may feel disadvantaged if specific tests are required to evaluate performance in order to obtain research results. In this study the research findings will be validated using the literature review.

1.9 OUTLINE OF THE RESEARCH REPORT

The study consists of five chapters.

Chapter 1 constitutes the scope of the study and contains an introduction, and explanation of approaches to knowledge workers, performance management, motivation and rewards for scientists, a problem statement, objectives, limitation and the research methodology to be applied.

Chapter 2 consists of a detailed literature review obtained from articles in business and academic journals and current publications regarding knowledge workers, knowledge organisations, performance management, motivation and rewards.

Chapter 3 explores the theoretical framework of descriptive qualitative analysis and how the research survey will be set up and conducted.

Chapter 4 explores the findings in relation to available literature, the applicable theory and the relationship to practice.

Chapter 5 presents a summary of the findings and conclusions as to possible changes in the reward system of the CSIR as a result of the findings originating from the study. Finally, the recommendations arising out of the research will be published to the CSIR.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to provide an overview of the current literature relating to knowledge workers, performance management, motivation and rewards.

2.2 KNOWLEDGE WORKERS

2.2.1 Defining knowledge workers

Horibe (1999:xi) defines knowledge workers as people who use their heads more than their hands to produce value.

Horibe (1999:xi) further states that one of the characteristics of knowledge workers is that a great deal of their job satisfaction comes from the knowledge itself – simply knowing a lot, being able to manipulate it, being able to create new knowledge. They derive satisfaction and self worth from these internal events, which makes it much harder for external events, like awards, to have meaning and power to shape their behaviour in the direction the company desires.

Walters (Feb 2002:45) defines knowledge work as a set of activities using individual and external knowledge to produce outputs characterized by information content.

Knowledge workers tend to enjoy higher levels of freedom in how and when they perform their work responsibilities, and thus experience more discretion and autonomy in their jobs (Walters, Feb 2002:45).

The term 'knowledge worker' is used to encompass both professionals and others with either disciplined-based knowledge, or more esoteric expertise and skills (Newell, *et al.*, 2002:25).

2.2.2 Knowledge Organisation

Lowendahl (1997) suggests that the crucial strategic difference between knowledge-intensive firms is the role of the professionals employed, that is, the characteristics of the resource base and the types of project targeted. Three generic types of knowledge-intensive firms premised on the organisation's strategic focus are described in Table 2.1.

Table 2.1 Types of Knowledge-Intensive Firms

	Strategic focus	Resources	Examples
Client based	Client relations	Individually controlled	Law and accountancy practices
Problem-solving	Creative problem-solving - innovation	Team based	Advertising agencies, software development firms
Output-based	Adaptation of ready solutions	Controlled by the organisation	Some large management consultancy firms.

A precise definition of a knowledge-intensive firm is elusive and it is clear from the term itself that it is a socially constructed, broad-ranging and yet quite ambiguous concept (Newell, *et al.*, 2002:26).

Alvesson (2001:863) describes knowledge-intensive firms as companies where most work can be said to be of an intellectual nature and where well-educated, qualified employees form the major part of the work force.

The capability to gather, leverage and use knowledge effectively will become a major source of competitive advantage and power, in many businesses over the next few years (Walters, Feb 2002:45). The journey to becoming a knowledge organisation will clearly not be easy. The initial knowledge management focus of the organisation

will aim principally at explicit knowledge and the establishment of tools that help the capture of information in the organisation. The long-term challenge and "real power" of knowledge is the ability to capture the knowledge of the organisation in a way that all can use it to add value to the organisation's assignments (Walters, 2002:44).

The challenge of deploying the knowledge assets of an organisation to create competitive advantage becomes more crucial as: (Walters, Mar 2000:44)

- Corporations are organising their business activities to be focused on creating customer value;
- Competitive pressures are reducing the size of the workforce which holds this knowledge;
- Knowledge takes time to experience and acquire. Employees have less time for this;
- There are trends for employees to retire earlier and for increasing mobility, leading to loss of knowledge and;
- A change in strategic direction may result in the loss of knowledge in a specific area.

A successful knowledge company is to have a clear value proposition identification of the link between knowledge and the bottom line business benefit, new measures of performance and appropriate rewards. The creation of a culture that supports innovation, learning and knowledge sharing, supported by appropriate reward mechanisms is also a success factor towards a knowledge company (Naidoo, 2002:48).

Knowledge-intensive firms rely on their human capital – specifically intellectual capital – for their competitive advantage. Therefore retention is a crucial strategic issue within these types of organisations (Newell, *et al.*, 2002:44).

The adhocracy, characterised by a dynamic organisational structure based on self-formed and self-managed teams, is considered to be an appropriate configuration, where innovation is the basis on which an organisation competes. Structural

constraints on knowledge work include the development of organisational 'best practice' templates, monitoring of knowledge workers' time and organisational growth (Newell, *et al.*, 2002:44).

Responsible autonomy is more likely to be achieved if management acknowledges that organisational culture is likely to be characterised by differentiation and fragmentation rather than consensus and integration. Therefore management should only attempt to loosely manage culture, aiming to promote an organisational ethos rather than a dominant core value system (Newell, *et al.*, 2002:44).

Knowledge creation within organisations, leading to the development of new products, services or processes, typically occurs within teams. Knowledge-sharing within a team will be successful if there is some shared understanding or knowledge redundancy among team members, such that the team develops an absorptive capacity for new ideas (Newell, *et al.*, 2002:65).

Teams essentially consist of individuals, each of whom has his or her own agenda, and individuals may use their power to attempt to satisfy personal goals. Teams thus suffer from many potential problems, including a propensity to conformity, groupthink, social loafing and group polarization effects. To overcome some of these problems there is a need to consider implementing integration mechanisms and in particular encouraging the development of trust between team members (Newell, *et al.*, 2002:65).

2.2.3 Knowledge Workers Behaviour

Generally, knowledge workers expect to have considerable autonomy in their work. The nature of the work, often characterised by creativity and problem-solving, demands autonomy. Unlike other kinds of workers, knowledge workers 'own' the organisation's primary means of production – that is knowledge. They therefore expect and demand autonomy and management is not really in a position to deny them (Newell, *et al.*, 2002:27).

Therefore, it is more appropriate within a knowledge-work setting to suggest that management's role is to provide conditions that will facilitate knowledge work (Newell, *et al.*, 2002:27).

Typically, knowledge workers organise in teams with more or less interdependence, depending on the nature of the task. The complexity of knowledge working often makes face-to-fact modes of interaction the only viable medium for communication at critical points in the process. Management again is required to develop strategies and mechanisms that will facilitate the coordination and integration of knowledge work processes across the team without directly intervening in those processes (Newell, *et al.*, 2002:28).

Most of a typical professional's activity is directed at perfection, not creativity. Customers want professional knowledge delivered reliably and with the most advanced skill available. Most of the work done by accounting units, hospital, software companies or financial service requires repeated use of highly developed skills on relatively similar, though complex problems, occasionally requires creativity. People rarely want surgeons, accountants, pilots, maintenance personnel or nuclear plant operators to be very creative (Quinn & Anderson, 1996:71).

Professionals have specialized knowledge and have been trained as an elite, they often tend to regard their judgement in other realms as sacrosanct as well (Quinn, *et al.*, 1996:71).

Knowledge workers are changed by the information in their environment and they in turn seek to change others through information. Diversity and ad hoc behaviour patterns are common in knowledge work. Communication networks are highly variable, with different patterns and use of media. Much of the knowledge exchanged is embedded in documents and electronic mail. (www: f)

Many human resource scholars are beginning to use the term "human capital" in describing today's work force. They also are being called "knowledge workers" (Rogoski, 1999).

reviewing/coaching, evaluation of results and development. The performance is examined on an individual, team and an organisational level (Sydänmaanlakka, 2002:88).

2.4.2 Why Performance Management Fails ?

Some of the major problems highlighted by Spangenberg's research in South Africa (1993:30-34) are:

- A lack of a culture of productivity and quality.
- Insufficient line management support.
- Employee mistrust of the real goals of performance review.
- Performance management systems becoming mechanistic and control orientated.
- Dwindling enthusiasm due to long implementation periods.
- Difficulties in linking other systems, for example the reward system to the performance management system.

The single biggest reason why performance management fails is because there is little differentiation between different levels of performance in terms of reward. An inability or unwillingness to recognise and reward performance, significantly affects the ability to attract and retain intellectual capital, sound employee relations (level of trust) and role modelling in the organisation. In order to establish high performance culture in an organisation it is very important to create role models of performance for others to follow and learn from, that is, individuals that exemplify in their behaviour the values and standards of performance the organisation espouses and strives towards (Slabbert, *et al.*, 2000:20-29).

According to Sydänmaanlakka (2002:89), one very important reason why performance management does not work properly is that performance management, especially planning and development discussions are used as separate tools. They have not been linked to the organisations other management systems. It requires clarity and breadth across the organisation as a whole, looking at the purpose of the activities, the key task areas, objectives and competence needed. Sydänmaanlakka further states that all the different levels of the organisation need to understand this

and communicate with each other. Only then will performance management start to work in practice.

2.4.3 Ability to Attract and Retain Knowledge Workers

Recognition for performance is one of the most effective ways through which managers can inspire people. However, the question is whether this understanding is implemented in organisations. The organisation of the future will have to recognise performance - if it wants to attract and retain the best people (Slabbert, *et al.*, 2000:20-29).

Current trends suggest that talented individuals will demand to be rewarded on the merits of their own performance. To most high achievers, performance should be the only basis for reward and a prerequisite to joining an organisation. Factors such as seniority and loyalty will always be recognised by organisations but only to the extent that an individual's years of experience translate into competitive knowledge or value-adding work or behaviour. Organisations with credible performance-based reward systems will clearly have an advantage in attracting and retaining top performers (Slabbert, *et al.*, 2000:20-29)

Clients may be inclined to offer permanent employment to knowledge workers who produce good results and who might prove to be a lot less expensive if employed directly by the client rather than on a consultancy basis. Management is therefore required to focus on strategies to aid retention in relation to direct competitors to the organisation; they must also consider the development of retention strategies in relation to their client organisations (Newell, *et al.*, 2002:27).

2.4.4 Pay for Performance

Pay for performance is the popular term for monetary incentives linking at least some portion of the pay cheque directly to results or accomplishments. The general idea behind pay for performance schemes including but not limited to merit pay, bonuses and profit sharing is to give employees an incentive for working harder or smarter (Kreitner, *et al.*, 1999:253).

A pay for performance approach described by Tulgan suggests the following:

- Measurable individual performance benchmarks. Every step of the way, clear deliverables should be clearly defined for every contributor and concrete rewards tied directly to those deliverables.
- Clear expectations (among managers and workers alike) about the relationship between specific individual behaviours and specific rewards.
- Regular and close monitoring by managers of individual performance and the keeping of good contemporaneous records (once again, this is high maintenance) and ongoing communication about the process between managers and individual contributors (Tulgan, 2001:22).

Example:

Mary is looking at a salary of $30,000 annually. We are going to make $40,000 available to her annually. But half of that is going to be on the line all the time. So she gets paid $20,000 as a base salary. The other $20,000, she gets on the basis of agreed-upon measures, one goal at a time or one project at a time. Whatever base is offered to somebody, the bonus is where the real compensation comes in. If Mary performs well she makes 33% more than she was hoping at the outset (Tulgan, 2001:22).

2.4.5 Conclusion on Performance Management

Without proper performance management, relative individual performance cannot be managed and rewarded appropriately. Therefore, the return on the investment made by the organisation in terms of its intellectual capital will be less than optimal.

However, the greatest loss for the organisation will be the unrealised and under utilised potential of its human capital (Slabbert, *et al.*, 2000:20-31).

2.5 REWARDS

2.5.1 Defining Rewards

Rewards are used to attract retain or bind and most importantly to encourage development and application of competencies. A reward would perhaps best be described as the motivation of specific behaviour (Slabbert, *et al.*, 2000:20-10).

A reward system is any process within an organisation that encourages, reinforces or compensates people for taking a particular set of actions. It may be formal, informal, cash, non-cash, immediate or delayed (Wilson, 1995:16).

Rewards are an ever-present and always controversial feature of organisational life (Kerr, 1996:95). According to Kreitner, *et al.*, (1999:249) some employees see their jobs as the source of a paycheque and little else. Others derive great pleasure from their jobs and association with co-workers. Hence, the subject of organisational rewards includes, but goes far beyond, monetary compensation.

Whatever the individual and cultural variations, reward, along with the strategies and systems related to it forms a significant part of a business's personnel policy. It can appeal to both the material and immaterial values of employees. Entrepreneurs and managers perceive in reward strategies a unique challenge and opportunity to make the most of what employees can contribute and be offered in return, in order to increase the potential of the net product (Kressler, 2003:113).

2.5.2 General Reward System

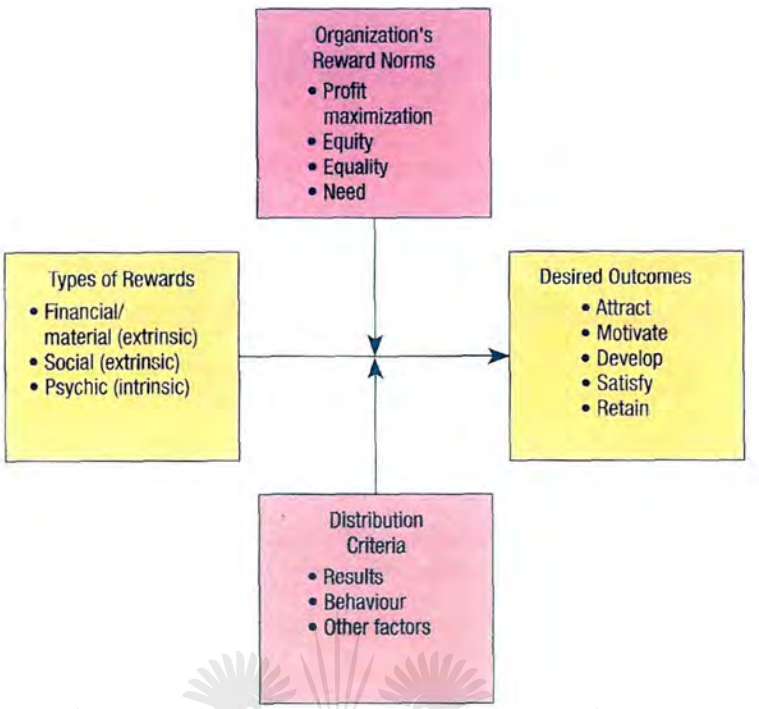

Figure 2.1 General Model of Organisational Reward Systems (Kreitner, *et al.*, 1999:250)

The model in Figure 2.1 focuses on four important components: type of rewards, reward norms, distribution criteria and desired outcomes. Organisational rewards are the distinction between extrinsic and intrinsic rewards (Kreitner, *et al.*, 1999:250).

Organisational reward norms entail profit maximisation, equity, equality and need. Profit maximisation is when the objective of each party is to maximise its net gain, regardless of how the other party fares. According to the reward equity norm, rewards should be allocated proportionate to contributions made by the employees. The reward equity norm rewards all parties equally, regardless of their comparative contributions (Kreitner, *et al.*, 1999:251).

Three general criteria for the distribution of rewards are performance results which include tangible outcomes such as individual, group or organisation performance,

quantity and quality of performance. Performance actions and behaviour such as teamwork, cooperation, risk taking and creativity are also criteria used. Non-performance considerations, such as customary or contractual, are rewarded, where the type of job, nature of work equity, tenure and level in hierarchy are appropriate (Kreitner, *et al.*, 1999:252).

The desired outcome of a reward system as listed in Figure 2 should attract talented people, motivate and satisfy them once they have joined the organisation. Further, a good reward system should foster personal growth, development and keep talented people from leaving (Kreitner, *et al.*, 1999:252).

2.5.3 Motivational Impact of Rewards

According to Lebby, *et al.* (1993), the effect of rewards on motivation and performance is one of the most studied subjects in the management literature. Year after year employees are asked what motivates them and year after year they reply, "a sense of accomplishment in performing the work itself, recognition from peers and top management, career advancement, management support, and only then, salary."

Managers can attract and retain employees by consulting, involving and encouraging learning, but in addition to these, how a company rewards its employees contributes heavily to their satisfaction and retention (Horibe, 1999:211).

According to Lebby, *et al.* 1993, an interview with an R&D scientist who was widely considered to be one of the three most important innovators in a large, successful company, states, "They offered me a pretty large salary increase this year, but I refused it", he recounted. "Right now, my lab is my play ground', I pretty much come in here and do things the way I want. But the more they pay you, the more they think they own you." This statement shows the different perceptions portrayed by knowledge workers on the subject of rewards.

From the interview, the feeling expressed by other scientists was that their salary increases recognised their creative contributions. Generous compensation, including

company-wide profit sharing, need not be seen as a bribe, particularly when it is presented as the equitable outcome of creative competence (Lebby, *et al.*, 1993).

2.5.4 Why do Rewards Fail to Motivate?

According to Kreitner, *et al.* (1999:252), despite huge investments of time and money for organisational reward systems, the desired motivational impact often is not achieved. The reasons for this are explained below:

1. To much emphasis on monetary rewards.
2. Extensive benefits become entitlements.
3. Rewards lack an "appreciation effect".
4. Counter productive behaviour is rewarded.
5. Too long a delay between performance and rewards.
6. Too many one-size fits all rewards.
7. Use of one-shot rewards with a short-lived motivational impact.
8. Continued use of demotivating practices such as layoffs, across the board rises and cuts, and excessive executive compensation.

Lebby, *et al.* (1993), also state that the work we do and how we do it have shifted significantly, but our reward and salary structures remain essentially the same. Our current notions of pay follow naturally from our antiquated, taylorist, mechanistic models for designing work. Organisations that have redesigned work to reflect cross-functional business processes or those that have implemented the actual principles of total quality management have had to rethink pay and performance.

In her article "Intellectual Capital – The New Wealth for Organisations", Naidoo (2002:46), states that organizational recognition and reward systems are not sufficiently recognizing knowledge contributions. They are linked to traditional financial measures.

Knowledge contributions can be explained as knowledge workers contributing to an organisation using their specific foundational and competency skills. The

foundational skills are basic educational experience and the competency skills are more closely related to what we do at work (Naidoo, 2002:48).

2.5.5 Incentives

Incentives range from tangible financial rewards to the intangible rewards of recognition and status. Knowledge-intensive organisations may also permit a more innovative approach to rewarding commitment. Examples of innovative rewards being used to foster knowledge management include the example of Hewlett Packard, where free Lotus Notes licences were distributed to encourage educators within the organisation to submit comments and ideas to knowledge bases. When a new knowledge was established, 2000 free air miles were offered to the first 50 readers and another 500 miles to anyone who posted a submission (Newell, *et al.*, 2002: 81).

As a company's major incentive, a gold watch after 30 years of service is no longer important. So, what's an employer to do to motivate and reward employees? Surprisingly, marketwise companies that are serious about satisfying and retaining employees don't seem to be making any changes to incentives at all (Marks, 2001:108).

Despite uncertainty in today's fast-paced global economy and tight labour market, recognition and reward programmes are more important than ever. Incentives are essential to top performers satisfied with their total compensation packages. Businesses simply cannot afford to have talented people leave the organisation. Incentives and bonuses can be in cash, performance-based pay or bonuses, cash equivalents like travel awards, or benefits such as employee training (Marks, 2001:108).

Rewards do not always have to be tangible incentives, people also work for respect, a sense of achievement, pride in their work, peer recognition and so on. (www:g)

A study pursued by Smayling (1987:82) states that incentives such as (large raises, additional technical support, nicer offices and promotions) were used by all scientific

firms participating in his study. Other rewards (more equipment, more vacation time and more flexibility in work assignments) were cited by none of the organizations as standard incentives. The only rewards routinely used were: small monetary payments for all patents, large "outstanding patent" bonuses and formal recognition systems.

Employees have said, "Give us the tools, the skills, the information, the support, and the respect we need." In different words, "Give us real capital, intellectual capital, and symbolic capital, and we'll increase your – and our- financial capital." (Lebby, *et al.*, 1993).

Money is an outcome of high performance. Satisfaction and respect are incentives to it (Lebby, *et al.*, 1993).

Companies that rely heavily on knowledge workers and fast growth may emphasise variable pay through stock options and invest its cash in product development. Incentives should be used to emphasise measurable outcomes. Shared goals should be used to encourage collaboration and co-operation. Challenging yet achievable goals should be set. Incentives should create excitement (Zingheim, 2001:20).

2.5.6 Financial rewards

This includes bonuses, incentive programmes, profit sharing, stock options, as well as just plain salary (Horibe, 1999:211).

Money is regarded as a short-term motivator. Knowledge workers whose primary incentive is money are not suitable to build intellectual capital on (de Geus, 1997:58).

Further, more money is still important but in today's knowledge economy its importance in motivating and retaining knowledge workers can be overblown. de Geus, (1997:58) notes in his Harvard Business Review study of long-lived companies: "Money is not considered a positive motivator in a [long-lived] company. If money above the threshold of sufficient pay will not motivate people to give more to the company .... the essence of the underlying contract is mutual trust. Individuals

understand that in exchange for their effort and commitment, the company will help them develop their potential" (de Geus, 1997:58).

Pay isn't the only factor that motivates people, but it is a powerful way for a company to communicate its values, directions, expectations and standards of quality and customer satisfaction. Everybody should be a stakeholder in company success. Build ownership from top to bottom so company success is broadly shared (Zingheim, 2001:20).

One of the highest forms of recognition to give employees is to make them an 'owner' of the company. This also makes people a lot more concerned about wastage of money on companies (as it is their money being squandered etc.) Shares can be limited to a few select staff or can be distributed quite broadly to a group (Nelson, 1994).

Pay strategies that motivate and reward individual growth, or are "value added" to the company's ability to compete, are perfectly logical, especially in an era when fewer opportunities are available to promote people into new pay grades.

2.5.7 Bonus Programme

The hope is that across-the-board rewards, whether in the form of profit sharing, employee stock ownership or bonuses will inspire people to work harder toward a company's goal. In practice, though, companywide incentives often produce disappointing results in big companies, at least in part because of what economists call the "free rider" problem. The experience of Continental Airlines however demonstrates that a company wide incentive programme can make a difference if it's done right (Knez & Simester, 2002).

Continental identified four factors that contributed to the programme's success:

- The right performance measure.
- Mutual monitoring
- Visible rewards
- Assured early momentum

In addition to increased employee effort and mutual monitoring, management saw reductions in employee turnover, on-the-job injuries and sick days. There are many reasons for the turnaround of Continental Airlines, but it seems clear from research that the bonus programme made a major contribution to changing employees attitudes and strengthening their performance (Knez, *et al.*, 2002).

2.5.8 Non-financial rewards

It is beyond doubt that non-financial measures can form a very significant part of overall reward strategies in a more developed sense. Their nature does not make them difficult to calculate and measure, but without doubt they have a high potential to stimulate performance, identification and abilities. Career development, promotion, feedback, communication and recognition can provide clear and effective indications of how performance is rewarded (Kressler, 2003:115).

2.5.8.1 Personal rewards

Despite how important it is to recognise people's contributions, by and large, managers are incredibly bad at it. Generally, they just do not do it, or if they do, it is as if every word of praise deducts a dollar from their personal bank accounts. Some managers praise only when the race has been won and avoid praise during the race. Some managers simply do not understand how important approval is to employees and are careless in their attention (Horibe, 1999:215).

People, particularly knowledge workers, need to know exactly how and what they're doing well. Praise will both feed the need for recognition and encourage them along the right path. Horibe (1999:219), states that the employer has tremendous power to influence through recognition. Using it will provide meaning and value to the work and thus increase the likelihood that knowledge workers feel committed to the company and want to stay (Horibe, 1999:219).

2.5.8.2 Award programmes

Personal recognition is a powerful way to reward employees one-on-one. Organisations often spend a lot of time and effort setting up these programmes, only to have them languish after the first flurry of interest. Nominations typically drop off to almost nothing and award winners often spend all the thirty seconds reading the plaque before tossing it into the drawer. Formal recognition programmes often lose sight of their true intent. Unless formal recognition programmes help knowledge workers stand a little taller and a little prouder, they have no value. So the critical factor in recognition programmes is their ability to create a sense of pride and honour in their recipients (Horibe, 1999:220).

It is critical that award programmes for knowledge workers reward what is clearly valued that is having a clear criteria for the award, making the awards winnable by all, setting up a ceremony, making each award count, focusing on personal recognition and considering letting peer groups choose award recipients (Horibe, 1999:221).

2.5.9 Conclusion regarding Rewards

Reward and reward related decisions are seen by employees as judgemental statements on their individual worth, relative to others: they communicate very clearly what the organisation or manager values or considers to be important. As such, reward places a value on individuals and has tremendous potential impact, positive or negative on the relationship between the manager and the employee. Although reward is considered to be an extrinsic motivator only, it greatly impacts on intrinsic motivation, morale and employee satisfaction (Slabbert, *et al.*, 2000:20-30).

Rewards do gain the attention of most people, especially if the rewards are meaningful, timely and associated with specific performance. Further rewards encourage people to focus on what is being reinforced and not on extraneous activities (Wilson, 1995:26).

Rewarding people for their work is an important aspect of attracting, retaining and tapping human capital. However an overemphasis on money can blind companies to other ways in which service can be acknowledged. This is particularly important since many of these techniques tap different needs in employees. If those needs (like recognition from peers and a sense of pride) are not met, then money alone will not be powerful enough to keep people engaged. Money is often used as the only lever in attempting to leverage intellectual capital in part because the other approaches (like communication, consultation and involvement) require some personal change either on the part of the managers, the employees or both (Horibe, 1999:225).

According to Horibe (1999:227), money doesn't have the power to attract and retain knowledge workers that most people think it has. Other rewards can be the organisation's competitive edge in attracting and retaining employees. Money is important but so is personal recognition. Most managers need to increase the amount and quality of the personal recognition they give. Companies should put greater effort into making their award ceremonies promote a sense of pride and accomplishment.

In future more frequent renovation of reward strategies will be more important than the all too often unsuccessful efforts to keep them consistent. In a world of 'fun' and 'novelty', change and renewal are in themselves valuable qualities (Kressler, 2003:124).

CHAPTER 3
METHODOLOGY

3.1 INTRODUCTION

This chapter initially outlines the research layout and design. The data collection methods used in the study include the development of a self-administered questionnaire, which are then discussed in detail. This chapter concludes with a discussion on the data analysis including a description of the methods employed.

3.2 RESEARCH DESIGN

The object of descriptive research is 'to portray an accurate profile of persons, events or situations' (Robson, 1993:4).

In descriptive studies, structured interviews can be used as a means to identify general patterns (Saunders, *et al.*, 2000:245).

The descriptive study is a type of conclusive research that has as its major objective the collection of data, which can be used to describe something. One of the most widely used techniques for gathering data in business, sociology and government is the descriptive survey or normative survey-it is used to describe the incidents, frequency and distribution of specifics characteristics of a population (Leedy, 1997:111).

Descriptive surveys deals with situations that require observation to be the primary means of data collection. This data must then be organised and presented in such a manner that valid and accurate conclusions can be drawn from it. A common instrument for observing data beyond the physical reach of the researcher is the questionnaire (Leedy, 1997:191).

Data collection tools for surveys include the interview and the questionnaire. Interviews allow the interviewer to clarify answers and follow up on interesting answers, while questionnaires are designed to be self-administered and can be mailed to a large number of respondents. Also, the respondent may not be inhibited in answering a questionnaire (Melville & Goddard, 1996:45).

Many authors argue that it is far harder to produce a good questionnaire than you might think. "You need to ensure that it will collect the precise data that you require to answer your research question (s) and achieve your objectives." The design of the question will affect the response rate, reliability and validity of the data you collect (Saunders, *et al.*, 2000:279).

Concerns exist regardless of the format being used. The way the researcher phrases a question or the researcher's tone of voice may result in incorrect or inappropriate responses. Some participants may not care much about the answer or may try to be bias. Interviewees may say what they thought their bosses wanted them to say. Observer error and bias is also a concern where different approaches are used in interpreting the replies.

A particular problem with questionnaires is that of non-returns. A problem of bias exists and is determined by the person's reasons for not returning the questionnaire. Examples include: respondent may be offended by the questionnaire, does not understand it, too lazy to respond to the questionnaire.

Respondents are therefore unlikely to be representative of the population, which means that these studies may be open to criticism in this regard (Melville, *et al.*, 1996:44)

Other concerns in the design of a survey exist with respect to errors of estimation. Errors of estimation include measurement errors, frame errors, non-response errors, selection errors and sampling errors. Measurement errors occur as a result of poorly designed questionnaires, the reluctance or inability of the interviewer to elicit the required information from the respondent and the reluctance or inability of the

respondents to provide it. Frame errors occur when a sample frame does not contain all the elements of the population being studied. Some elements being omitted, duplicated and/or foreign elements in the sample frame may cause this (Loubsher, 1996:227-289).

Three major categories of non-response errors are due to potential respondents being unavailable but willing, unavailable and unwilling or available but unwilling. Repeated follow-ups are most effective for reducing the non-response rate. Selection errors occur when all elements in the population do not have the same chance of being selected. Finally, sample errors occur when only a fraction of the population is studied (Loubsher, 1996:277-289).

For this study only a self-administered questionnaire was developed using guidelines suggested by Saunders, *et al.* (2000).

3.3 DATA COLLECTION

The human resource managers of Bio/Chemtek, Miningtek and Environmentek were interviewed prior to the distribution of the self-administered questionnaire to individuals. The content of the research study was discussed and the questionnaire was submitted to the managers for comments. It was found that the questionnaire would be relevant to only certain areas in the business unit. A list of scientists involved was submitted by the managers. Input was given by the human resource manager of Miningtek to concentrate on monetary rewards as the main reason for people leaving was based on higher salary in the mining sector. The managers found that the study was relevant to the organisation.

This study was conducted using electronic mail. A web-site link was created which was electronically mailed to 20 scientists. As the respondents answered the questionnaire, the answers were directly captured on to a database that was created for this survey. There were no financial incentives or any other form of reward offered for the participation in this study because the completion of the questionnaire was entirely voluntary as stated in the researcher's introduction letter (Appendix A).

3.3.1 Survey Focus

The research was targeted at the three business units, Bio/Chemtek, Miningtek and Environmentek. Other business units in the CSIR were not targeted, as these business units are a fair representation of the population. The mailing list submitted by the human resource managers was used. 80 participants were electronically mailed.

3.3.2 The Self-administered Questionnaire

The self-administered questionnaire was aimed at scientists within the four-stage career framework. The questionnaire (Appendix B) consisted of multiple choice questions and open-ended questions.

A partly closed-response questionnaire design was used to provide a simpler format for completion, while minimizing the possibilities for misinterpretation. The closed-response layout also provided an easy mechanism for structuring responses that could be easily tallied during data analysis.

In order to speed up the process, the questionnaire was electronically mailed to the scientists by a web-site link. A covering letter was included with the questionnaire to explain the rationale for the survey. (Appendix A)

Respondents were requested to return their questionnaires within a two-week period. Subsequent to the deadline passing, the researcher proceeded to administer a telephonic follow up to all the potential respondents that had not returned by the specified due date. A further 8 questionnaires were received as a result of the telephonic follow-up.

3.4 DATA ANALYSIS

All returned responses were retrieved by the database. They were carefully examined for completeness and accuracy of response. The questionnaire consisted of both open and closed-ended questions, therefore it was relatively difficult to determine if errors had been made.

The data analysis was performed using Microsoft Excel 97. This data was then used to create graphical representation of some data that is presented and analysed in the next chapter. In order to validate the research findings, the literature review will be used to determine the outcome of this research.

CHAPTER 4
DATA ANALYSIS

4.1 INTRODUCTION

The purpose of this chapter is to present the findings of the research undertaken and to compare the results to the available literature presented in Chapter 2.

4.2 QUESTIONNAIRE

4.2.1 Introduction

The questionnaire consisted of 54 questions in total (See Appendix B). The questionnaire consisted of a few basic questions regarding demographic profiles before moving onto questions focusing on the objectives of this research. The demographic profiles included details such as business unit, age, gender, ethnic group, qualification and years of experience. The other questions focused on job satisfaction, non-monetary rewards, monetary rewards, shortcomings of the organisations reward system and suggestions to improve the reward system.

4.2.2 Questions relating to demographic data

The results are as follows:

4.2.2.1 Choose your business unit. (Question 1)

Figure 4.1 represents a pie chart of the scientists whom participated in this research from the different business units.

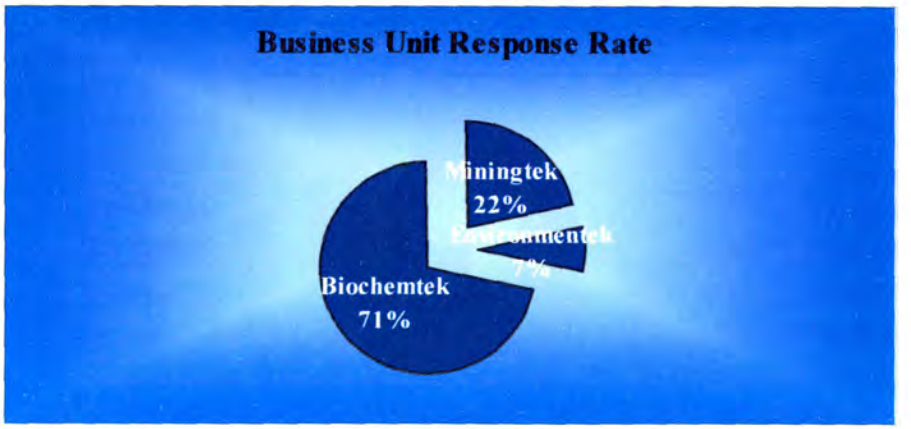

Figure 4.1 Business unit response rate

The majority of the scientists fall into the Bio/Chemtek business unit. These 33 respondents made up 71% of the total number of scientists who completed the questionnaire. The second largest group are those falling into Miningtek. These 10 respondents made up 22% of the total number of scientists who participated in this research.

A very low response of 3 respondents from Environmentek was obtained. This made up 7% of the total number of scientists who completed the questionnaire. This is a concern as the scientists were either too busy to answer the questionnaire, or had a lack of interest in the subject. It must be remembered that a similar survey was performed by Environmentek a few years ago. These are only some reasons for a poor response, there could be many other factors relating to this.

4.2.2.2 Choose your age group. (Question 2)

Figure 4.2 shows a breakdown of the age of the scientists who participated in this research.

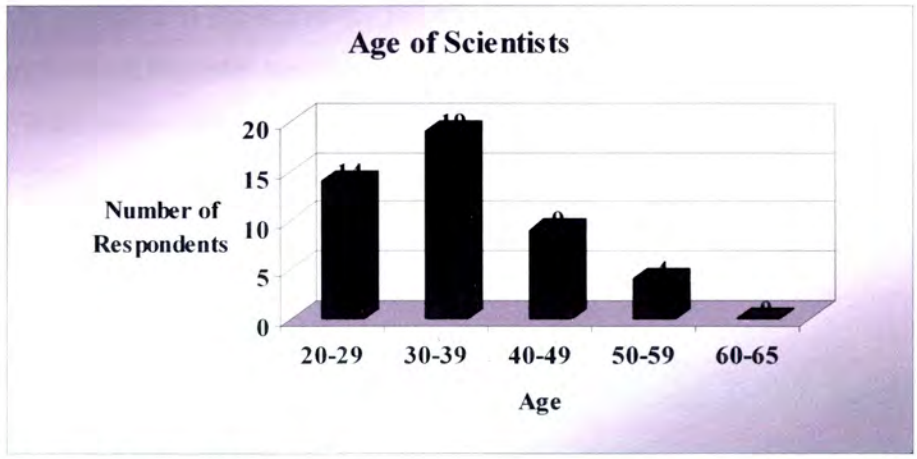

Figure 4.2 Age of scientists

Majority of the scientists fall into the 30-39 age group. These 19 respondents made up 41% of the total number of scientists who completed this questionnaire. The second largest group are those falling into the 20-29 age group. These 14 respondents made up 30% of the total number of scientists who participated in this research. This shows that the age of the participants are fairly young. These scientists are still growing and developing themselves in their specialised fields.

4.2.2.3 Choose your gender. (Question 3)

Figure 4.3 shows a breakdown of the percentage of male and female scientists whom participated in this research.

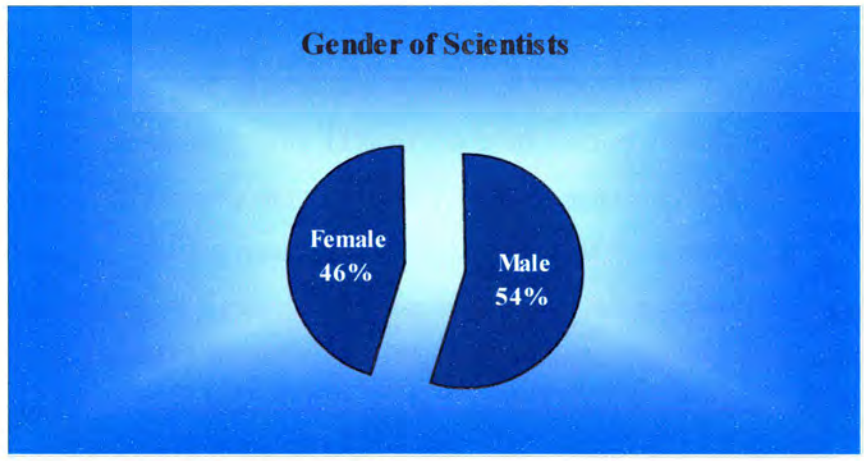

Figure 4.3 Gender of scientists

The majority of the scientists fall into the male category. These 25 respondents made up 54% of the total number of scientists who completed this questionnaire. The 21 female respondents made up 46% of the total number of scientists. There seems to be a fairly even distribution of male and female scientists whom participated in this research.

4.2.2.4 Choose your ethnic group. (Question 4)

Figure 4.4 shows a breakdown of the ethnic group of the scientists whom participated in this research.

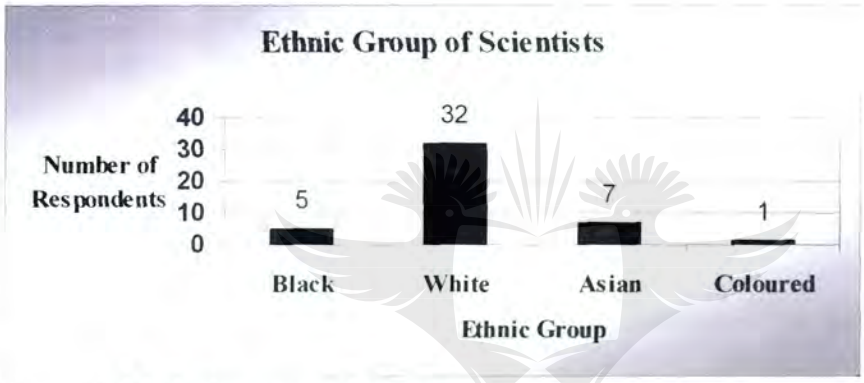

Figure 4.4 Ethnic group of scientists

The majority of the scientists fall into the White group. These 32 respondents made up 71% of the total number of respondents. The second largest group are those falling into the Asian group. These 7 respondents make up 16% of the total number of scientists who participated in this research. This was followed by 5 respondents in the Black group making only 11% of the total number of scientists. The coloured group consisted of 1 respondent making 2% of the scientists involved in this research. The conclusion that the researcher has drawn is that the response rate for the black group is very low. This could be due to the limited number of black scientists in the organisation, the scientists were too busy to take part in this research or their lack of interest in the subject. However, the rate of response correlates with the racial composition of the scientist workforce.

4.2.2.5 What is your highest level of qualification? (Question 5)

Figure 4.5 shows the level of qualification of the scientists.

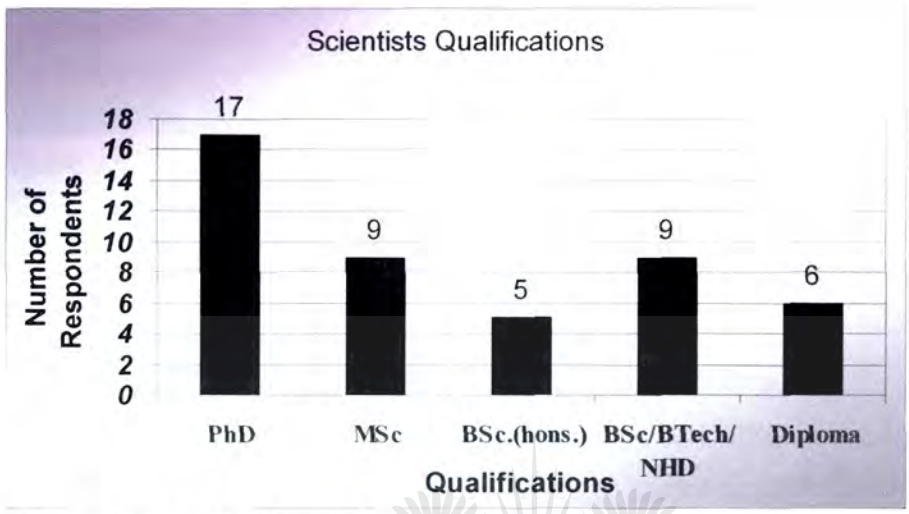

Figure 4.5 Scientists' qualifications

The majority of the scientists have a PhD qualification. This makes up 37% of the total number of scientists. 20% of the scientists have a MSc qualification and a further 20% have a BSc/Btech/NHD qualification. A further 10% of scientists have a BSc.(hons.) qualification and 13% a diploma. The research is targeted at the appropriate level of education and knowledge.

4.2.2.6 Years of experience. (Question 6)

Figure 4.6 shows the years of experience of the scientists who participated in this research.

Figure 4.6 Years of experience of scientists

Majority of the scientists fall into the 3-10 years of experience group. These 22 respondents made up 49% of the total number of scientists who completed this questionnaire. The second largest group are those falling into the 10-20 years of experience group. These 10 respondents make up 22% of the total number of scientists who participated in this research. 7 respondents fell into the >20 years group which consisted of 16% of the scientists and the remainder 6 respondents fell into the <3 years group consisting of 13 % of the total number of scientists.

4.2.3 Questions relating to knowledge workers and job satisfaction

4.2.3.1 Do you enjoy your job? (Question 7.1)

Majority of the respondents are in agreement. 48% of the respondents (22) are in agreement and 33% of the respondents (15) strongly agree that they enjoy their job. 6% of the respondents (3) is in disagreement and 2% of the respondents (1) strongly disagree with the statement of job enjoyment. It can be observed that the scientists have made the right career choice and/or the organization is providing them with the environment in which they can fulfill their job expectations.

4.2.3.2 You derive pleasure from your association with co-workers? (Question 7.2)

Majority of the respondents are in agreement. 63% of the respondents (29) are in agreement and 24% of the respondents (11) strongly agree in deriving pleasure from

association with co-workers. In the literature survey, Kreitner, *et al.* (1999:252) refers to employees deriving pleasure from association with co-workers, hence the subject of organisational rewards includes, but goes far beyond, monetary compensation (Chapter 2, 2.4.1).

4.2.3.3 You enjoy high levels of freedom in your job? (Question 7.3)

Majority of the respondents are in agreement. 39% of the respondents (18) are in agreement and 33% of the respondents (15) strongly agree in enjoying high levels of freedom in their job. The conclusion is that scientists enjoy high levels of freedom in their job. According to Walters (2003:45) knowledge workers tend to enjoy high levels of freedom in how and when they perform work responsibilities (Chapter 2, 2.2.1).

4.2.3.4 The knowledge work that you are involved in is directed at perfection, not creativity? (Question 7.4)

35% of the respondents (16) were neither in agreement or disagreement. 30% of the respondents (14) disagreed. A further 24% of respondents (11) agreed. According to Quinn, *et al.* (1996:2) most of a typical professional's activity is directed at perfection, not creativity. He does not mention if this applies to scientists in particular (Chapter 2, 2.2.2). There is a split view to this question. This is quite significant as it shows that a certain percentage of the scientists' work is directed at creativity.

4.2.3.5 Scientists need to know exactly how and what they are doing well? (Question 7.5)

Majority of the respondents are in agreement. 49% of the respondents (22) are in strong agreement and 37% (17) are in agreement. Horibe (1999:219) states that knowledge workers need to know exactly how and what they are doing well (Chapter 2, 2.4.7.1). The conclusion is in favour of Horibe's statement.

4.2.3.6 You attain job satisfaction by obtaining knowledge itself? (Question 7.6)

Majority of the respondents are in agreement. 41% of the respondents (19) are in strong agreement and 24% of the respondents (11) neither agreed or disagreed. In the literature survey, Horibe (1999:xi) states that one of the characteristics of knowledge workers is that a great deal of their job satisfaction comes from knowledge itself (Chapter 2, 2.2.1). The conclusion is in favor of Horibe's statement.

4.2.3.7 You attain job satisfaction by knowing a lot? (Question 7.7)

Majority of the respondents are in agreement. 33% of the respondents (15) agreed and 30% of the respondents (14) neither agreed or disagreed. Horibe (1999:xi) states that one of the other characteristics of knowledge workers is that a great deal of their job satisfaction is simply knowing a lot (Chapter 2, 2.2.1). The conclusion is in favor of Horibe's statement.

4.2.3.8 You attain job satisfaction by manipulation of knowledge? (Question 7.8)

Majority of the respondents are in agreement. 41% of the respondents (19) are in agreement and 28% of the respondents (13) strongly agree. According to Horibe (1999:xi) one of the characteristics of knowledge workers is that a great deal of their job satisfaction is by being able to manipulate knowledge (Chapter 2, 2.2.1). The conclusion is in favor of Horibe's statement.

4.2.3.9 You attain job satisfaction by creating new knowledge? (Question 7.9)

Majority of the respondents are in agreement. 48% of the respondents (22) are in strong agreement and 37% of the respondents (17) agreed. According to Horibe (1999:xi) one of the characteristics of knowledge workers is that a great deal of their job satisfaction is obtained by creating new knowledge (Chapter 2, 2.2.1). The conclusion is in favor of Horibe's statement.

4.2.3.10 You see your job as the source of a pay cheque or little else? (Question 7.10)

Majority of the respondents are in disagreement. 33% of the respondents (15) strongly disagreed and 28% of the respondents (13) disagreed. 26% of the respondents (12) neither agreed or disagreed with this concept. According to Kreitner, *et al.*,(1999:249) some employees see their jobs as the source of a pay cheque and little else. The response to this question contradicts Kreitner's statement.

4.2.3.11 You are familiar with your organisation's reward system? (Question 7.11)

Majority of the respondents are in agreement. 41% of the respondents (19) agreed and 24% of the respondents (11) neither agreed or disagreed.

4.2.3.12 Organisational recognition and reward systems are sufficiently recognizing your contribution? (Question 7.12)

Majority of the respondents are in disagreement. 33% of the respondents (15) strongly disagreed, 30% of the respondents (14) neither agreed nor disagreed, 20% of the respondents (9) agreed and a further 15% of the respondents (7) disagreed. This response indicates that the reward system of the organization is not optimal.

4.2.4 Questions related to non-monetary rewards in order of importance.

4.2.4.1 Management can attract you by consulting, involving and encouraging learning. (Question 8.1)

Majority of the respondents considered this to be important. 52% of the respondents (24) felt it was important and 28% of the respondents (13) felt it was very important. Horibe (1999:211) states that managers can attract and retain employees by consulting, involving and encouraging learning. The response indicates that the scientists can be retained or satisfied if managers consult and involve them in decisions and provide a learning environment.

4.2.4.2 Satisfaction and respect are incentives towards high performance. (Question 8.2)

Majority of the respondents considered this to be important. 48% of the respondents (22) felt it was important and 37% of the respondents (17) felt it was very important. Horibe (1999:227) states that money is important, but so is personal recognition (Chapter 2, 2.5.9). In conclusion, satisfaction and respect are important incentives towards high performance.

4.2.4.3 Personal recognition, e.g. A simple Thank You. (Question 8.3)

Majority of the respondents considered this to be important. 52% of the respondents (24) felt it was important and 35% of the respondents (16) felt it was very important. In conclusion personal recognition is an important non-monetary reward.

4.2.4.4 Formal recognition of patents, publications, journal articles etc. from peers and top management by an award ceremony. (Question 8.4)

Majority of the respondents considered this to be important. 41% of the respondents (19) felt it was important and 24% of the respondents (11) felt it was very important. In conclusion formal recognition of patents, publication, journal articles etc. from peers and top management by an award ceremony is considered to be important in terms of non-monetary reward.

4.2.4.5 Recognition by Title. (Question 8.5)

Majority of the respondents considered this not important. 35% of the respondents (16) felt it was not important and 24% of the respondents (11) felt neither was important nor unimportant. In conclusion recognition by title is not considered as an important non-monetary reward.

4.2.4.6 Recognition for sustained technical excellence by awarding fellowships. (Question 8.6)

Majority of the respondents considered this to be important. 35% of the respondents (16) felt it was important and 30% of the respondents felt it was very important. In conclusion recognition for sustained technical excellence by awarding fellowships is considered to be an important non-monetary reward.

4.2.4.7 Formal recognition involving coupons for dinner for two. (Question 8.7)

39% of the respondents (18) felt neither was important nor unimportant. 24% of the respondents (11) felt this was not in the least of importance. In conclusion, formal recognition involving coupons for dinner for two could be used but is not an important component of non-monetary rewards.

4.2.4.8 Best publication award where funding is granted to further research/develop networks/attend a conference. (Question 8.8)

Majority of the respondents considered this to be important. 39% of the respondents (18) felt this was important and 30% of the respondents (14) felt this was very important. In conclusion a best publication award where funding is granted to further research/develop networks/attend a conference is considered to be important in terms of non-monetary reward.

4.2.4.9 Conference attendance (Question 8.9)

Majority of the respondents considered this to be very important. 46% of the respondents (21) felt this was very important and 33% of the respondents (15) felt this was important. In conclusion conference attendance is considered to be of extreme importance in terms of non-monetary reward.

4.2.4.10 Training courses (Question 8.10)

Majority of the respondents considered this to be important. 37% of the respondents (17) felt this was important and 33% of the respondents (15) felt this was very important. In conclusion training courses are considered to be of great importance in terms of non-monetary reward.

4.2.4.11 Overseas travel relevant to the field of experience. (Question 8.11)

Majority of the respondents considered this to be important. 41% of the respondents (19) felt this was important and 37% of the respondents (17) felt this was very important. In conclusion overseas travel relevant to the field of experience is considered to be of great importance in terms of non-monetary reward.

4.2.4.12 Studies (graduate, post graduate). (Question 8.12)

Majority of the respondents considered this to be very important. 37% of the respondents (17) felt this was very important and 33% of the respondents (17) felt this was important. In conclusion furthering ones studies is considered to be of great importance in terms of non-monetary reward.

4.2.4.13 Career advancement opportunities. (Question 8.13)

Majority of the respondents considered this to be very important. 46% of the respondents (21) felt this was very important and 43% of the respondents (21) felt this was important. In conclusion career advancement opportunities is considered to be of great importance in terms of non-monetary rewards.

4.2.4.14 Additional technical support in developments. (Question 8.14)

Majority of the respondents considered this to be very important. 39% of the respondents (18) felt this was very important and 35% of respondents (16) felt that

this was important. In conclusion additional technical support in developments is considered to be of great importance in terms of non-monetary reward.

4.2.4.15 More equipment and instrumentation. (Question 8.15)

Majority of the respondents considered this to be very important. 41% of the respondents (19) felt this was very important and a further 41% of the respondents (19) felt this was important. In conclusion more equipment and instrumentation is considered to be of great importance in terms of non-monetary reward.

4.2.4.16 Better office space. (Question 8.16)

Majority of the respondents considered this to be neither important nor unimportant. 30% of the respondents (14) felt this was neither important nor unimportant and 26% of the respondents (12) felt it was not important. In conclusion better office space is not considered to create a great impact in terms of non-monetary reward.

4.2.4.17 Sabbaticals. (Question 8.17)

Majority of the respondents considered this to be very important. 35% of the respondents (16) felt this was very important and 28% of the respondents (13) felt neither. In conclusion sabbaticals is considered to be of great importance in terms of non-monetary reward.

4.2.4.18 More vacation time. (Question 8.18)

Majority of the respondents considered this to be neither important nor unimportant. 33% of the respondents (15) felt this was neither important nor unimportant and 26% of the respondents (12) felt this was very important. In conclusion extra vacation time is not considered a great impact in terms of non-monetary reward.

4.2.4.19 More flexibility in work assignments. (Question 8.19)

Majority of the respondents considered this to be important. 46% of the respondents (21) felt this was important and 26% of the respondents (12) felt this was very important. In conclusion flexibility in work assignments is considered to be of importance in terms of non-monetary reward.

4.2.5 Questions related to monetary rewards in order of importance

4.2.5.1 Pay based performance, which ultimately leads to variable pay. (Question 9.1)

Majority of the respondents considered this to be very important. 33% of the respondents (15) felt this was very important and 26% of the respondents (12) felt this was important. In conclusion pay based performance, which ultimately leads to variable pay is considered to be of great importance in terms of monetary reward.

4.2.5.2 Merit Bonus. (Question 9.2)

Majority of the respondents considered this to be very important. 46% of the respondents (21) felt this was very important and 41% of the respondents (19) felt this was important. In conclusion merit bonuses are considered to be of great importance.

4.2.5.3 End of year awards of monetary value, a voucher/gift. (Question 9.3)

Majority of the respondents considered this to be important. 41% of the respondents (19) felt this was important and 35% of the respondents (16) felt this was very important. In conclusion end of year awards of monetary value, a voucher/gift are considered to be of importance.

4.2.5.4 Car allowance or benefits. (Question 9.4)

Majority of the respondents considered this to be very important. 37% of the respondents (17) felt this was very important and 33% of the respondents (15) felt this

was important. In conclusion car allowance or benefits are considered to be of great importance.

4.2.5.5 Cell phone allowance. (Question 9.5)

Majority of the respondents felt this was neither important nor unimportant. 39% of the respondents (18) felt this was neither important nor unimportant. Cell phone allowance is not considered to be of great importance.

4.2.5.6 Special interest rates. (Question 9.6)

Majority of the respondents considered this to be very important. 35% of the respondents (16) felt this was very important and 30% of the respondents (14) felt this was important. Special interest rates are considered to be of great importance.

4.2.5.7 Salary increase, generally once a year. (Question 9.7)

Majority of the respondents considered this to be very important. 65% of the respondents (30) felt this was very important. In conclusion salary increases, generally once a year are considered to be of great importance.

4.2.5.8 Profit sharing (Question 9.8)

Majority of the respondents considered this to be very important. 48% of the respondents (22) felt this was very important and 30% of the respondents (14) felt this was important. In conclusion profit sharing is considered to be very important in terms of monetary rewards.

4.2.5.9 % of Total Cost of Earnings (Question 9.9)

Majority of the respondents considered this to be very important. 37% of the respondents (17) felt this was very important and 30% of the respondents (14) felt this

was important. In conclusion percentage of total cost of earnings is considered to be of great importance in terms of monetary rewards.

4.2.5.10 Stock options (Question 9.10)

Majority of the respondents considered this to be neither important nor unimportant. 48% of the respondents (22) felt this was neither important nor unimportant and 24% of the respondents felt this was very important. Stock options is considered to not have a great impact in terms of monetary rewards.

4.2.5.11 Small monetary payments for all patents, publications. (Question 9.11)

Majority of the respondents considered this to be very important. 39% of the respondents (18) felt this was very important and 37% of the respondents (17) felt this was important. In conclusion small monetary payments for all patents and publications is considered to be of great importance in terms of monetary rewards.

4.2.5.12 Large bonuses for outstanding patents, publications. (Question 9.12)

Majority of the respondents considered this to be very important. 46% of the respondents (21) felt this was very important and 28% of the respondents (13) felt this was important. Large bonuses rewarded for outstanding publications and patents are considered to be of great importance.

4.2.6 Open ended questions

4.2.6.1 What aspect of your job do you enjoy the most? (Question 10)

26% of the respondents (12) expressed research and innovation as the aspect that they enjoy the most. 15% of the respondents (7) felt that creativity and expressing new ideas as the most enjoyable. 13% of the respondents (6) felt problem solving as the most enjoyable. 11% of the respondents (5) expressed that the freedom to approach and do their work was most enjoyable. 7% of the respondents (3) felt learning new

information, 7% felt non-routine work and a further 7% felt client interaction to be most enjoyable. 4% of the respondents (2) enjoyed hands on bench work.

The remainder 10% of the respondents enjoy travelling abroad fostering partnerships, flexible working hours, teamwork, achieving an aim and working with professionals. It is clear that the composition of work for these scientists is important and that it should focus more on research, innovation and creativity.

4.2.6.2 What allows you to attain job satisfaction? (Question 11)

35% of the respondents (16) felt providing useful information, making a contribution technically or strategically and knowing that their input is valued and needed. Also finding solutions to problems and making a positive impact by seeing results making a difference. 22% of the respondents (10) felt a good working environment conducive to high performance standards, working space, atmosphere, management enabling the set up of this environment and an appreciate environment.

15% of the respondents (7) felt recognition for good performance and hard work by salary adjustments or bonuses, verbal or monetary recognition allows one to attain job satisfaction. 7% of the respondents (3) felt learning from peers and 7% felt sufficient time to complete tasks allows one to attain job satisfaction. 4% of the respondents (2) felt flexibility in working hours allows one to attain job satisfaction. The remainder 10% of the respondents felt clear growth aspects, leadership, furthering ones studies, knowledge contacts and working with competent enthusiastic co-workers allows one to attain job satisfaction.

The response shows that scientists enjoy being involved by contributing to the organisation and adding significant value. It is clear that the working environment enables the scientists to attain job satisfaction. Recognition for good performance by salary adjustments or bonuses, verbal or monetary recognition also contributes to their job satisfaction.

4.2.6.3 Which is of greater value to you, monetary or non-monetary reward? (Question 12)

46% of the respondents (21) felt monetary reward is of greater value. 33% of the respondents (15) felt both monetary and non-monetary reward is of great value. 19% of the respondents (9) felt non-monetary reward is of greater value. 2% of the respondents (1) had no comment. Although monetary reward is of greater value, both are required. One cannot leave out one type of reward at the cost of another type of reward. Also, the extent to which monetary reward is required varies throughout a person's life.

4.2.6.4 What are the shortcomings of the reward system in your organisation? (Question 13)

26% of the respondents (12) are not familiar with the reward system, does not understand how it works and felt that there is no real reward system. 24% of the respondents (11) felt that the rewards are relatively small and not sufficient. 17% of the respondents (8) felt management is inconsistent and use different criteria to reward bonuses. 13% of the respondents (6) felt there is no recognition for innovation.

7% of the respondents (3) felt the reward system does not focus on individuals. 4% of the respondents (2) stated that the reward system should be applicable at all levels in the organisation. The remainder 6% of the respondents felt profit sharing incentives should be introduced, felt that incentive schemes drives the wrong behaviour and the rewards are predicated on the fact that cash is the only incentive. 2% of the respondents (1) felt there is no shortcoming of the reward system.

It is clear that the reward system is not optimum in fulfilling the scientists' needs. The communication and understanding of the reward system needs to be addressed.

4.2.6.5 Do you have any suggestions on how your organisation's reward system can be improved? (Question 14)

22% of the respondents (10) felt monetary rewards could be improved. 17% of the respondents (8) had no comment. 11% of the respondents (5) felt profit sharing could be introduced. 11% of the respondents (5) felt technical rewards based on innovation could be introduced. 9% of the respondents (4) felt a team bonus is a good idea.

6% of the respondents (3) did not give a response, 6% felt goals should be clear within the performance management process and 6% felt more frequent rewards should be given. 4% of the respondents (2) felt management should understand what motivates individuals.

4.3 CONCLUSION

The understanding of what motivates knowledge workers and their behaviour is complex and multi-dimensional. The focus of this study was on the identification of those areas that need to be improved. From the scientists view, an understanding has been attained regarding behaviour, job satisfaction, motivational incentives, monetary and non-monetary reward, shortcomings and improvement of the reward system. It is clear that the organisation's reward system is insufficient in recognising the scientists' contribution (Chapter 4, 4.2.3.12.) For the reward system to be successful in order to attract and retain these knowledge workers changes will have to be made. A more successful reward system will enable the organisation to protect its intellectual capital and thereby maintain the characteristics of a knowledge intensive organisation.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The aim of this chapter is to summarise the key points and issues that have emerged as a result of this research. In addition, to provide feedback on the research challenges faced and lessons learnt in the conducting of this research. Finally, recommendations will be made regarding the findings as well as future research opportunities and requirements thereof.

In order to move towards a knowledge intensive organisation the CSIR'S strategy is to manage and empower knowledge workers to promote the qualities of strong commitment, loyalty and ownership, to create a culture of trust, sharing, collaboration and manage diversity. (www:a)

The biggest challenge facing organisations world wide today, especially in South Africa is to adapt to rapid, ongoing local and global change and fierce competition accompanying it (Slabbert, *et al.*, 2000:20-5). Most business people today would agree that knowledge work is important, that it is the heart of innovation, which is itself the key to long-term organisational sustainability and growth, and that recruiting and retaining the best knowledge workers are vital to organisational success (Davenport, Thomas & Cantrell, 2002:23).

The needs of knowledge workers, as well as their behaviour, was researched to determine if the current reward system is appropriate to promote the objectives of a knowledge intensive organisation. Important components such as performance management and motivation were also researched, as it forms an important part of an effective reward system for knowledge workers.

The objectives of this research were to identify what motivates and satisfies knowledge workers, to determine if monetary or non-monetary reward is of greater value, to establish benefits and shortcomings of the existing reward system in the

organisation and to recommend appropriate changes to the reward system. As an effective reward system cannot function in isolation as an entity on its own, certain recommendations with regard to innovation, leadership of knowledge workers, performance management, motivation and system changes will also be made.

5.2 SUMMARY OF FINDINGS

5.2.1 Demographics

This study focused on a core group of scientists at four different stage levels in the organisation. Majority of the scientists are from Bio/Chemtek and fall into the 30-39 age group. They are predominantly male and of the white group. Majority of the scientists have a PhD qualification with 3-10 years of work experience.

5.2.2 Knowledge Workers Behaviour and Job Satisfaction

It is clear that the scientists enjoy their job, they derive pleasure from associating with co-workers and enjoy high levels of freedom in their job. Furthermore, they have a need to know how and what they are doing well in their job. The scientists believe that the knowledge work that they are involved in is directed at perfection and creativity. The scientists attain job satisfaction through the gathering of new knowledge, by manipulation of knowledge and by creating new knowledge.

The scientists do not see their job as only a source of a pay cheque. The scientists expressed research and innovation as the aspect of their job they most enjoyed. They also felt that creativity and expressing new ideas was the most enjoyable (Chapter 4, 4.2.6.1).

The scientists attain satisfaction by providing useful information, making a contribution technically or strategically and knowing that their input is valued and needed (Chapter 4, 4.2.6.2). The scientists' work environment and recognition for good performance also contribute to their job satisfaction.

5.2.3 Monetary Reward *versus* Non-Monetary Reward

The scientists considered monetary reward of greater value (Chapter 4, 4.2.6.3). However, both monetary and non-monetary rewards are important. One can not be neglected at the cost of the other. As Horibe (1999:227) states, money is important, but so is personal recognition (Chapter 2, 2.5.9).

5.2.3.1 Importance of Monetary Reward

The scientists considered salary increase generally once a year and small monetary payments for all patents and publications to be very important monetary rewards.

The following in order of importance were considered to be important monetary rewards.

- Profit sharing
- Merit Bonus
- Large bonuses for outstanding publications and patents
- Car allowance benefits
- Bonuses calculated as a percentage of the total cost of earnings of the employee
- Special interest rates
- Pay based performance, which ultimately leads to variable pay

Cell phone allowances and stock options were not considered as important monetary rewards.

5.2.3.2 Importance of Non-Monetary Reward

The scientists considered career advancement opportunities, additional technical support in developments and studies (graduate, postgraduate) to be very important non-monetary rewards. These non-monetary rewards were rated the highest among the others.

Furthermore, the scientists considered the following non-monetary rewards to be of importance in terms of rewards and motivation. These are listed in order of importance.

- Management's attraction by consulting, involving and encouraging learning
- Personal recognition e.g. A simple thank you
- Scientists felt that satisfaction and respect are incentives towards high performance
- Conference attendance
- More flexibility in work assignments
- Formal recognition of patents, publications, journal articles etc. from peers and top management by an award ceremony
- Adequate equipment and instrumentation
- Overseas travel relevant to the field of experience
- Best publication award where funding is granted to further research/develop networks attend a conference
- Training courses
- Recognition for sustained excellence by awarding fellowships.
- Sabbaticals.

Formal recognition involving coupons for dinner for two, better office space, more vacation time and recognition by title were not considered as important non-monetary rewards.

5.2.4.1 Benefits of the Current Reward System

A component of extrinsic and intrinsic rewards offered by the current reward system was included in the survey. It is clear that there are incentives of the current reward system that are beneficial to the scientists.

The scientists considered annual salary increases, merit bonuses, small monetary payments for all patents and publications and large bonuses for outstanding patents and publications to be extremely beneficial in terms of monetary reward. Car

allowance or benefits and a percentage of an employee's total cost of earnings are also considered to be extremely beneficial in terms of monetary reward. End-of-the-year awards of monetary value which include a voucher or gift are considered to be an important monetary reward.

It is clear that career advancement opportunities, conference attendance, studies (graduate, postgraduate) and sabbaticals are considered to be extremely beneficial in terms of non-monetary reward. The other important non-monetary rewards in the current reward system are personal recognition, e.g. a simple thank you, recognition for sustained technical excellence by awarding fellowships, training courses and overseas travel relevant to the field of experience.

The scientists have shown that both monetary and non-monetary reward are beneficial in the current reward system. This means that the incentives considered to be beneficial need to remain active in the present reward system.

5.2.4.2 Shortcomings of the Current Reward System

The most common shortcoming stated by the scientists is that they are not familiar with the reward system. This statement is in contradiction to the answer received in (Chapter 4, 4.2.3.11) where the scientists agreed that they are familiar with the system. It is clear that the reward system is not effectively communicated or understood among some of the scientists.

The scientists feel that the monetary rewards offered for good performance are relatively small. The scientists felt very strongly that management shows inconsistency when rewarding bonuses and that good performance is not recognised by management.

Another shortcoming mentioned by the scientists is that there is no recognition for innovation. It is clear that the current reward system is not sufficient in recognising the scientists' contribution.

5.2.4.3 Suggested Improvements to the Current Reward System

The scientists felt that there should be a significant increase in terms of monetary reward. Some felt that profit sharing should be introduced into the reward system.

The scientists also felt that there should be technical rewards based on innovation. They considered team bonuses as a good means of rewarding performance as the scientists tend to work in project teams.

Other suggestions were that clear goals should be set in the performance management process and that management should understand what motivates individuals. It is clear that the current reward system needs improvement.

In conclusion, there are aspects of the present reward system that are beneficial to the scientists and should be maintained but it is also clear that there are shortcomings in the system. The shortcomings and improvements suggested by the scientists need to be addressed. Recommendations will be made to enable an appropriate reward system in order to attract and retain the scientists so that the organisation can maintain and further build their knowledge base.

5.3 MANAGEMENT RECOMMENDATIONS

The scientists need more involvement in research and innovation. They need to feel free to express new ideas and creativity. They need to be motivated on activities performed well. They need to be recognised and rewarded for innovation. The organisation needs to address innovation in alignment with characteristics of a knowledge intensive organisation in order to understand and retain the knowledge workers.

For the organisation to pursue an innovation strategy it requires a number of important characteristics which are described by Schuler and Jackson. It requires jobs that involve close interaction and co-ordination among groups of individuals. Performance appraisals should reflect longer-term and group based achievements.

There should be jobs that allow employees to develop skills that can be used in other positions in the organisation. The organisation will also require compensation systems that emphasize internal equity rather than external or market based equity. The pay rates may be low, but this will allow employee's to be stakeholders and have more freedom to choose from the mix of components (salary, bonus, stock options) that make up their pay package. A broad career path to reinforce the development of a broad range of skills is also needed (Schuler & Jackson, 2002:323).

Motivating creative employees seems to require rather a different human resource strategy to that devised with the opposite intent of controlling passive and compliant employees (Caudron, 1994:103). Individual innovative behaviour is governed by perceptions of the climate for innovation, management style and group relations and is mediated through this, either directly or indirectly. Innovative behaviour is related to the quality of the supervisor-subordinate relationship (Scott, Bruce & Reginald, 1994).

Management can motivate knowledge workers by allowing them a challenge, freedom, resources (time & money), work group features, supervisory encouragement and organisational support in their jobs (Amabile, 1998).

Managing knowledge workers for innovation will in reality, require more than activating each of the key aspects separately. It is rarely possible to facilitate innovation simply through a reward system or through restructuring, or through a conducive organisational culture. Management needs to attend to the issue of integration and mutual reinforcement between these levels. Another overarching point is the involvement with a socio-political process. In short, the management of knowledge workers for innovation is unlikely to be a straightforward technical problem.

Schuler and Jackson (2002:318) suggest that, if the business strategy is geared towards competitive advantage built around innovation, certain behaviour patterns will be needed from employees. These include:

- High degree of creative behaviour
- Long- term focus
- Relatively high degree of co-operative behaviour
- Moderate concern for quality
- Moderate concern for output in terms of quantity
- Risk taking
- High tolerance of ambiguity

This means that management has to ensure careful selection of highly skilled people, ensuring employees have autonomy and discretion, using minimal managerial controls, investing in training and development, making available resources for experimentation, tolerance of a certain degree of failure and performance evaluation over a long period (Schuler, *et al.*, 2000:318). As Schuler, *et al.* (2000) state, rather than emphasizing managing people so they work harder (cost-reduction strategy) or smarter (quality strategy) on the same products or services, the innovation strategy requires people to work differently.

A distinction has to be drawn between factors which drive innovation and the methods available to managers who want to improve innovative performance. Interventions to spur project teams into delivering more innovative performance were steps such as increasing their budget and more complex and involved interventions were to reform the project team system itself (Christiansen, 1996).

The motivation to be innovative may be impeded if the traditional measure of short-term financial performance is given priority. The adoption of the 'balanced score card' approach by some organisations may help to counter one-dimensional measurement by setting out a broader range of objectives. Score cards vary, but innovation would be one of the target domains and this can help to motivate employees in this desired direction.

Companies whose success depends on innovation are rewarding people for knowledge and skills (Covin & Stigers, 1997). Reward strategies can cover a broad spectrum extending beyond direct pay. There can be rewards for acquiring innovative

capability and rewards for outputs such as achieving innovation targets. Reward might also take the form of recognition for achievement. This might mean applauding innovators more enthusiastically. It could also mean allowing space, time and resources for successful innovators to pursue their ideas.

An award programme to reward innovation should be implemented. Horibe (1999:221) states that it is critical for award programmes to reward knowledge workers for what is clearly valued in an organisation. The award programme should have clear criteria and the awards should be winnable by all. Setting up a ceremony, making each award count, focusing on personal recognition and considering letting peer groups choose award recipients are also seen as beneficial (Chapter 2, 2.5.8.2).

Management needs to address the manner in which performance management is performed as this directly impacts on the reward granted to scientists. Performance management needs to be re-emphasised in the organisation, that it is a continuous process. Management requires training on the performance management process and its application to enable the management of knowledge workers. Management needs to state clear objectives during the performance appraisal of scientists. They need to show consistency during the rewarding process. Management needs to understand what motivates individuals or teams.

Performance management is not new. Planning and development discussions should be closely linked to the organisation's other management systems. It requires clarity and breadth across the organisation holistically looking at the purpose of the activities, the key task areas, the objectives and competence needed. All different levels in the organisation need to understand this and communicate with each other (Sydänmaanlakka, 2002:89).

Management needs to effectively support the implementation of the performance process. Performance management should be examined on an individual, team and organisational level (Sydänmaanlakka, 2002:91). In knowledge intensive organisations, research teams are often used in projects. Knowledge creation or knowledge generation is typically an activity that is accomplished by a team of people

rather than by individuals working alone. Knowledge creation needs to be seen as an interactive team working process, one which involves a diverse range of actors with different backgrounds, cutting across organisational boundaries, combining skills, artefacts, knowledge and experiences in new ways. Trust is seen to be a critical issue in a team for effective team working and knowledge sharing (Newell, Robertson, Scarbrough & Swan, 2002:480).

Since majority of the scientists are involved in project teams, performance management should also be implemented at a team level by the organisation. Appendix D shows an example of a planning and development discussion of a team (Sydänmaanlakka, 2002:221). This could be used by management as a guideline to facilitate future performance management of project teams. Since the scientists considered team bonuses as a good means of rewarding performance, this guideline for the measurement and rewarding of team performance should be considered. It could also enable consistency during the reward process.

According to Rajan, Lank & Chapple (1998) the 'balanced scorecard' approach involving team based rewards and the development of appropriate metrics could be used for rewarding team bonuses. In some contexts it is difficult to apply a formal reward system to knowledge management. The value of knowledge is hard to measure when a team or individual is involved (Newell, *et al.*, 2002:82). One has merely stated the importance of teamwork in a knowledge organisation and that rewarding team bonuses can not be done in isolation without an effective performance management process in place.

Performance management is a continuous process that requires daily leadership, planning meetings and planning development discussions. Line managers should be the owners of the process (Sydänmaanlakka, 2002:91). Training and development of management are important as it is their line responsibility to facilitate the performance management process effectively. In this regard it is recommended that the necessary development programme for managers, which can consist of courses, workshops and conferences, be attended, to promote the understanding of the performance management process.

Leadership matters enormously in terms of knowledge workers obtaining satisfaction and motivation. Nearly 70 percent of a company's ability is to retain key people through just two factors: leadership and employee commitment. Leadership affects retention directly - people want to work for leaders they admire and also indirectly - good leaders bring people to share values, and people who share values share knowledge, and people who share knowledge tend to stay together (Stewart, 2001:312). One of the major roles of leadership is to create a culture. It is important that the values required in creating an ideal environment for innovation and sharing is within the context of a knowledge organisation.

The reward system needs to be effectively communicated to all levels in the organisation. A communication strategy needs to be implemented. The lack or mismanagement of communication is the single greatest direct and indirect contributing factor to dissatisfaction of workers in South African business organisations (Slabbert, *et al.*, 2000:14-3). In an environment in which organisational communication takes place today, an *ad hoc* approach is clearly ineffective. The organisation needs to look at communication holistically (Slabbert, *et al.*, 2000:14-10). The reward system should be communicated including other integrated systems such as performance management, knowledge management within the context of the organisations strategy.

The communication strategy must be orientated into specific objectives. In order for the communication to be effective, it must be planned, controlled and measured (Slabbert, *et al.*, 2000:14-11). For a successful reward system the communication and understanding is critical for implementation. Scientists need to know what type of reward exists, what is the purpose of these rewards and how performance will be measured. These components cannot be seen in isolation as they all compliment an effective reward system.

The scientists recommended a significant increase in the value of the monetary reward. This will impact on the budget available for rewarding scientists. An increase in monetary reward should be market related, in order to retain the

knowledge workers whom are the organisations competitive advantage. Bonuses and salary increases are dependent on the organisation's financial performance as well as the budget and priority value of innovation as determined by top management with approval of the board. The monetary reward will depend on the contribution and performance of the scientists.

An example of a bonus scheme is presented in Chapter 2, 2.4.4, but this is dependent on the organisations financial performance and also knowledge or innovation targets.

Profit sharing was recommended by the scientists as a monetary reward that could be introduced into the reward system. Most of today's corporate pay-for performance plans are profit sharing schemes. Profit sharing occurs when individual employees or work groups are granted a specified portion of any economic profits earned by the business as a whole. Profit sharing bonuses may be paid in cash or deferred until retirement (Kreitner, *et al.*, 1999:255).

The CSIR is a parastatal organisation (it receives a Parliamentary grant). It does not operate as a profit maximisation organisation but supports sustainable development and economic growth in the context of national priorities and global challenges. One could implement profit sharing when loyalties are derived through the generation of patents or transferring of scientific technology and knowledge.

The scientists also need a conducive working environment in order to be satisfied in their jobs and improve performance. It is clear that just a reward system is not sufficient to retain and satisfy scientists. Factors such as the work environment also play an important role in the retention and performance of scientists. The reward system cannot be isolated as it integrates with many aspects like structure, culture, performance and motivation. All these aspects complement each other to produce an effective reward system.

It is a mistake to combine all knowledge workers into one category. They vary in important ways, such as the work processes they follow, by status and influence and by differentiation of work environment. Companies can segment their work force into

many levels, but using a simple "low, medium and high" is best for simplicity's sake and captures most of the variation (Davenport, *et al.*, 2002:27).

Some companies offer their knowledge workers high degrees of choice about how to configure their own environment within the constraints of a designated group or work setting. Granting such options preserves a much valued feeling of autonomy and generally increases knowledge worker satisfaction, according to previous research and findings (Davenport, *et al.*, 2002:28).

Depending on the knowledge that workers need to get their work done, whether on their own or as members of teams, there is an optimal level of segmentation and choice that can be expressed as one of nine solutions in the matrix described by Davenport below (Figure 5.1).

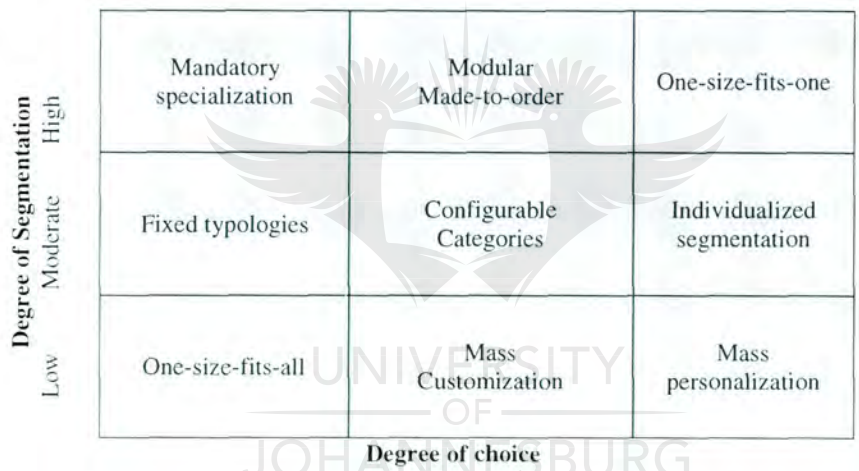

Figure 5.1 Framework of Work-Setting Solutions (Davenport, *et al.*, 2002:29).

Davenport, *et al.*, (2002:30) also state that all solutions eventually fail. Organisations must therefore monitor the changing needs of their knowledge workers and keep abreast of how technologies may enable new ways of working. Organisations cannot begin to increase their understanding of what makes knowledge workers effective until they recognise the importance of these workers as a whole and how to differentiate among them as individuals. Only then can they begin to apply and

combine the tools and approaches now being developed in a manner that is both cost-effective for the company and conducive to high performance in their employees.

From the researchers view, an effective reward system cannot operate in isolation. Management of knowledge workers, performance management and motivation plays a very significant role in obtaining a successful reward system. Figure 5.2 (Sydänmaanlakka, 2002:177) below is a framework that has been adapted to show how the reward system, performance management and knowledge management overlaps in forming an appropriate reward system for the organisation. These key aspects need to be understood in order to drive the reward system.

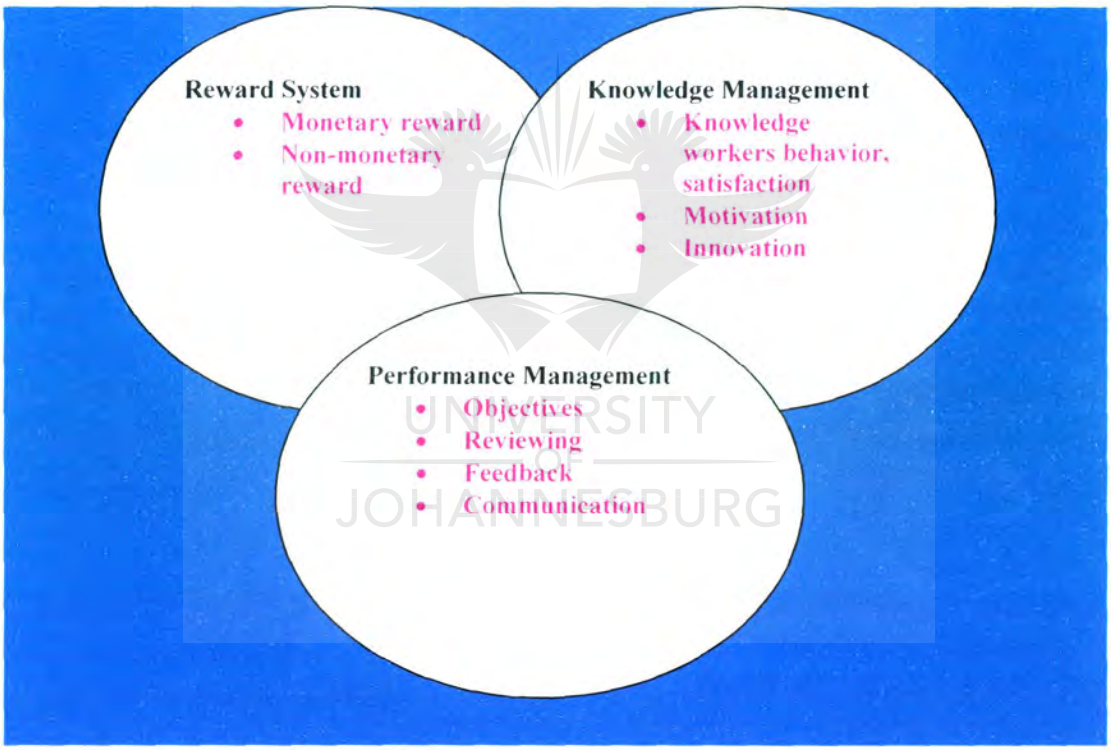

Figure 5.2 Framework of the Reward System, Performance Management and Knowledge Management (adapted from Sydänmaanlakka, 2002:177).

The monetary rewards and non-monetary rewards that are considered to be beneficial in the existing reward system, described in Chapter 5, 5.2.4.1, should remain. It is also important that both monetary and non-monetary rewards remain as the one can not be neglected at the cost of the other.

The changes that need to be made to the present reward system should include rewards for innovation, team bonuses, an increase in the value of monetary reward and profit sharing when loyalties are derived through the generation of patents or transferring of scientific technology and knowledge. The knowledge workers also need a conducive working environment in order to satisfy and retain them. As Horibe (1999:225) appropriately states, money is not the only lever in attempting to leverage intellectual capital, but approaches (like communication, consultation and involvement) are required by both management and knowledge workers.

Finally, for the reward system to be effective the recommended changes need to be made to attract and retain the scientists, to maintain the knowledge base, to be competitive in a knowledge intensive industry.

5.4 RESEARCH CHALLENGES

A very low response rate of the survey was obtained from two of the three business units - Miningtek and Environmentek, the reason being that Environmentek had a similar study within the business unit. Bio/Chemtek's response rate was the highest as the researcher was part of this business unit and was familiar to the respondents. Therefore this research finding is predominantly that of Bio/Chemtek.

5.5 FUTURE RESEARCH

It is recommended that this study be performed in other business units in the CSIR and similar knowledge organisations to obtain a better understanding of the motivation of knowledge workers and rewards that are required by them.

Innovation strategies focused at a knowledge organisation can also be further researched.

Reward systems need continuous revision as the market demand and knowledge workers expectations change. The research was based on current industry demands this will require continuous research in future.

Knowledge management requires in depth research in the organisation, aspects such as knowledge sharing, culture, collaboration, appropriate behaviour of managers/ leaders need to be researched to maintain a knowledge organisation.

5.6 LESSONS LEARNED

The researcher had no research experience prior to conducting this study. The following items discussed are the more important lessons learned in the conducting or this research.

The research study embarked on is so vast in terms of literature available on motivation, performance management and reward systems it was difficult to conclude the literature survey.

The collection of information in the form of literature required the researcher to become a member of various libraries. In addition, the researcher has become aware of the effective library resources available at the CSIR through its databases.

Any research involves a trade off between quality and time. It has been realised that both quality and time is equally required in order to successfully and duly complete this study. Therefore careful planning is required at the outset.

This topic also enjoyed a high level of interest. This is evident by the number of respondents who participated and completed the research questionnaire in Bio/Chemtek. Therefore, it is recommended that further research be conducted and that the sample size can be increased.

The researcher has learnt that there is so much more than just financial reward and that knowledge workers are such a special type of people. We need to make an effort to understand and keep them satisfied.

The researcher has realised the high profile attention knowledge workers are attracting in the economy and thus their important role in the knowledge economies of today.

5.7 CONCLUSION

The research has achieved the initial objectives as defined in Chapter 1, 1.4. A number of recommendations is proposed and presented in this research for the decision-makers at CSIR to evaluate and implement accordingly.

BIBLIOGRAPHY

Alvesson, M. (2001):

"Knowledge Work: Ambiguity, Image and Identity", Human Relations, Vol. 54, No. 7, 863.

Amabile, T. (1998):

"How to Kill Creativity", Harvard Business Review, Sept-Oct: 77-87.

Caudron, S. (1994):

"Motivating Creative Employees Call's for New Strategies", Personnel Journal, Vol. 73, No. 5, 103.

Christiansen, J. (1996):

"Learning to Manage Innovation Simple and Complex Solutions to the Problem of Improving Innovation Performance", Working Paper No. 96/32, Fontainebleau, INSEAD.

Covin, T.J. & Stigers, B.P. (1997):

"Knowledge Management focus in US and Canadian Firms", Creativity and Innovation Management, Vol. 6, No. 3. 140-51.

Davenport, T.H., Thomas, R.J. & Cantrell, S. (2002):

"*The Mysterious Art and Science of Knowledge-Worker Performance.*" MIT Sloan Management Review, Vol. 44, No. 23.

De Geus, A. (1997):

"*The Living Company*", Harvard Business Review, March-April: 58.

Gibson, J.L., Ivancevich, J.M. & Donnelly, J.H. (1994):

"*Organisations: Behaviour, Structure, Processes*", Eighth Edition, Burr Ridge, Illinois: Irwin.

Herzberg, F. (2003):

"*One More Time: How Do You Motivate Employees*?", Harvard Business Review, January: 3-11.

Horibe, F. (1999):

"*Managing Knowledge Workers: New Skills and Attitudes to Unlock the Intellectual Capital in your Organization*", Canada, John Wiley & Sons Canada Limited.

Knez, M. & Simester, D. (2002):

"*Making Across-the-Board Incentives Work*", Harvard Business Review, February: 16-17.

Kerr, S. (1996):

"*Risky Business: The New Pay Game*", Fortune, 22 July: 95.

Kreitner, R., Kinicki, A. & Beulens, M. (1999):

"*Organizational Behaviour*", First European Edition, England: McGraw-Hill International (UK) Limited.

Kressler, H.W. (2003):

"*Motivate and Reward Performance Appraisal and Incentive Systems for Business Success*", New York, Palgrave Macmillan.

Lebby, A.M., Stewart, G.B., Appelbaum, E., Beer, M., Kozlowski, L.D., Baker, G.P. & Wolters, D.S. (1993):

"*Rethinking Rewards*", Harvard Business Review, Vol. 71, Issue 6, Nov/Dec: 37.

Leedy, P. (1997):

"*Practical Research, Planning and Design*", Upper Saddle River: Prentice Hall.

Levinson, H. (2003):

"*Management by whose Objectives?*", Harvard Business Review, January: 3-11.

Loubsher, M. (1996):

"Survey Errors in Marketing Research: In a South African Approach", Martins, J.H., Loubsher, M., van Wyk, H.J. (Editors). Pretoria: Unisa Press.

Lowendahl, B. (1997):

"Strategic Management of Professional Service Firms", Copenhagen: Copenhagen Business School Press.

Marks, S.J. (2001):

"Incentives that Really Reward and Motivate", Workforce, Vol. 80, Issue 6: Jun: 108.

Melville, S. & Goddard, W. (1996):

"Research Methodolgy: An Introduction for Science and Engineering Students", Kenwyn, Juta & Co. LTD.

Mitchell, T.R. (1982):

"Motivation: New Direction for Theory, Research and Practice", Academy of Management Review.

Naidoo, V. (2002):

"Intellectual Capital the New Wealth for Organisations", HR Future, February: 46-47.

Naidoo, V. (2002):

"Intellectual Capital its Value and Strategies for Implementation", HR Future, March: 48.

Nelson, B. (1994):

"1001 Ways to Reward Employees", Workman Publication Copy.

Newell, S., Robertson, M., Scarbrough, H. & Swan, J. (2002):

"Managing Knowledge Work", New York, Palgrave Publishers Ltd.

Quinn, J.B. & Anderson, P. (1996):

"Managing Professional Intellect: Making the Most of the Best", Harvard Business Review, Vol. 74, Issue 2, Mar/Apr: 71.

Rajan, A., Lank, E. & Chapple, K. (1998):

"Good Practices in Knowledge Creation and Exchange", Tunbridge Wells: Create.

Robson, C. (1993):

"Real World Research", Oxford, Blackwell.

Robbins, S. P. (1994):

"Essentials of Organisational Behaviour", Fourth Edition, New Jersey: Prentice-Hall.

Rogoski, R. R. (1999):

"Knowledge Workers Top Company", Triangle Business Journal, January.

Saunders, M., Lewis, P. & Thornhill, A. (2000):

"Research Methods for Business Students", Second Edition, Great Britain: Ashford Colour Press Ltd.

Schuler, R.S. & Jackson. S.E. (2002):

"Linking Competitive Strategies with Human Resource Management Practices", Little, S., Quintas, P. & Ray, T. (Editors). The Open University, Managing Knowledge, Great Britain, Cromwell Press Ltd.

Scott, S., Bruce, G. & Reginald, A. (1994):

"Determinants of Innovative Behaviour: A Path Model of Individual Innovation in the Workplace", Academy of Management Journal, Vol. 37, No.3, 580-607.

Slabbert, J.A., Prinsloo, J.J., Swanepoel, B.J. & Backer, W. (1998):

"Managing Employment Relations in South Africa", Durban, Butterworth Publishers.

Smayling, M.M. (1987):

"Incentive Systems for Research and Development Scientists and Engineers", UMI Dissertation Information Services, Michigan, 82.

Spangenberg, H. (1994):

"Understanding and Implementing Performance Management", Kenwyn: Juta

Stewart, T.A. (2001):

"The Wealth of Knowledge", First Edition, New York: Doubleday.

Swanepoel, B., Erasmus, B., van Wyk, M. & Schenk, H. (2000):

"South African Human Resource Management Theory and Practice", Second Edition, Cape Town, Juta and Co. Ltd.

Sydänmaanlakka, P. (2002):

"An Intelligent Organization", United Kingdom, Capstone Publishing Limited.

Tulgan, B. (2001):

"*Real Pay for Performance*", Journal of Business Strategy, May/June: 22.

Walters, N. (2002):

"Transform Knowledge into Competitive Edge", HR Future, February: 44-45.

Walters, N. (2002):

"Knowledge Management the Imperative to Manage Knowledge", HR Future, March: 44-45.

Wilson, T.B. (1995):

"Innovative Reward Systems for the Changing Workplace", New York, McGraw-Hill.

Zingheim, P. K. (2001):

"Retaining Top Talent", Executive Excellence, Vol. 18, Issue 3, March: 20.

www:a, 2002/2003. CSIR Business Planning Guidelines

http://intraweb.csir.co.za, 30/06/2003

www:b, 2002/2003. CSIR KITO Business Plan

http://intraweb.csir.co.za, 30/06/2003

www:c, 2002. CSIR Career Development Policy and Framework

http://intraweb.csir.co.za/cmm/mcl/2002/mc101_2002.html, 30/01/2002

www:d, 2002. Sciendaba

http://intraweb.csir.co.za/sciendaba/42/04/01.html, 29/01/2002

www:e, 2002. CSIR Performance Management Framework and Policy

http://intraweb.csir.co.za/cmm/documents/humres/performance_management.html, 24/06/2004

www:f, 2004. A Study of Knowledge Workers

http://d3e.open.ac.uk/general/negotiating-org-mem/negotiating-org-mem-03.html, 28/03/2004

www:g, 2002. Rewarding Contribution

http://www.processedge.com/store/reward.htm, 29/05/2002

APPENDIX A

Dear Respondent,

This research questionnaire forms part of a request to finalise my studies towards the degree Masters of Business Administration (MBA).

The completion of this degree requires a completion of a dissertation based on exploratory research conducted in a field that would add value to an organisation and in addition to the world of research and development.

My aim is: To evaluate the current reward system and take into consideration the needs of these scientists in order to recommend an appropriate reward system to the organisation which would improve retention of skills and knowledge.

The objectives of this research are:

- To identify what motivates and satisfies knowledge workers.
- To determine if monetary or non-monetary reward is of greater value.
- To establish the benefits and shortcomings of the existing reward system in the organisation.
- To recommend changes to the reward system focused at a knowledge organisation.

In order for me to analyse the above objectives and to formulate my findings and recommendations, you are hereby requested to complete the attached questionnaire. This questionnaire is entirely voluntary. However, by you completing this questionnaire this will add value and input into my research. Please remember that you will always remain anonymous.

In order to answer this questionnaire, select your option from the drop-down box. Where there are no alternatives to choose from please supply a detailed response.

Thank you for participating in this research.

Yours sincerely

ANESHRI PADAYACHY

APPENDIX B

QUESTIONNIARE

1. **Business Unit**

Miningtek	
Bio/Chemtek	
Environmentek	

2. **Age**

20-29	
30-39	
40-49	
50-59	
60-65	

3. **Gender**

Male	
Female	

4. **Ethnic group**

Black	
White	
Asian	
Coloured	

5. **Highest Qualification:** .....

6. **Years of experience in your field:**

<3 years
3-10 years
10-20 years
>20 years

7. **Indicate the extent to which you agree with the following statements as they relate to your job by marking a cross (X) against the appropriate number, using the scale below:**

1 – Strongly disagree
2 – Disagree
3 – Neither agree or disagree
4 – Agree
5 – Strongly agree

7.1	Do you enjoy your job?	1	2	3	4	5
7.2	You derive pleasure from your association with co-workers	1	2	3	4	5
7.3	You enjoy high levels of freedom in your job	1	2	3	4	5
7.4	The knowledge work that you are involved in are directed at perfection, not creativity	1	2	3	4	5
7.5	Scientists need to know exactly how and what they are doing well	1	2	3	4	5
7.6	You attain job satisfaction by obtaining knowledge itself	1	2	3	4	5
7.7	You attain job satisfaction by knowing a lot	1	2	3	4	5
7.8	You attain job satisfaction by manipulation of knowledge	1	2	3	4	5
7.9	You attain job satisfaction by creating new knowledge	1	2	3	4	5

7.10	You see your job as the source of a pay cheque or little else	1	2	3	4	5
7.11	You are familiar with your organization's reward system	1	2	3	4	5
7.12	Organizational recognition and reward systems are sufficiently recognizing your contribution	1	2	3	4	5

8. From your experience as a scientist, rate these <u>non-monetary rewards</u> in order of importance. Place a cross (X) against the appropriate number using the scale below:

1 – Very important
2 – Important
3– Neither Important nor Unimportant
4 – Not important
5 – Not in the least Important

8.1	Management can attract you by consulting, involving and encouraging learning	1	2	3	4	5
8.2	Satisfaction and respect are incentives towards high performance	1	2	3	4	5
8.3	Personal recognition, eg. a simple Thank You.	1	2	3	4	5
8.4	Formal recognition of patents, publications, journal articles etc. from peers and top management by an award ceremony	1	2	3	4	5
8.5	Recognition by Title	1	2	3	4	5
8.6	Recognition for sustained technical excellence by awarding fellowships	1	2	3	4	5
8.7	Formal recognition involving coupons for dinner-for two	1	2	3	4	5

8.8	Best publication award where funding is granted to further research/develop networks/ attend a conference.	1	2	3	4	5
8.9	Conference attendance	1	2	3	4	5
8.10	Training courses	1	2	3	4	5
8.11	Overseas travel relevant to the field of experience.	1	2	3	4	5
8.12	Studies (graduate, post graduate)	1	2	3	4	5
8.13	Career advancement opportunities	1	2	3	4	5
8.14	Additional technical support in developments	1	2	3	4	5
8.15	More equipment and instrumentation	1	2	3	4	5
8.16	Better office space	1	2	3	4	5
8.17	Sabbaticals	1	2	3	4	5
8.18	More vacation time	1	2	3	4	5
8.19	More flexibility in work assignments	1	2	3	4	5

9. From your experience as a scientist, rate these <u>monetary rewards</u> in order of importance. Place a cross (X) against the appropriate number using the scale below:

1 – Very important
2 – Important
3– Neither Important nor Unimportant
4 – Not important
5 – Not in the least Important

9.1	Pay based on performance which ultimately leads to variable pay	1	2	3	4	5
9.2	Merit Bonus	1	2	3	4	5
9.3	End of year awards of monetary value, a voucher/gift.	1	2	3	4	5
9.4	Car allowance/benefits	1	2	3	4	5

9.5	Cell phone allowance	1	2	3	4	5
9.6	Special interest rates	1	2	3	4	5
9.7	Salary increase, generally once a year.	1	2	3	4	5
9.8	Profit sharing	1	2	3	4	5
9.9	% of Total Cost of Earnings	1	2	3	4	5
9.10	Stock options	1	2	3	4	5
9.11	Small monetary payments for all patents, publications	1	2	3	4	5
9.12	Large "outstanding patent, publication" bonuses	1	2	3	4	5

10. What aspect of your job do you enjoy the most?

11. What allows you to attain job satisfaction?

12. Which is of greater value to you, monetary or non-monetary reward?

13. What are the shortcomings of the reward system in your organisation?

14. Do you have any suggestions on how your organisation's reward system can be improved?

APPENDIX C

1. Questionnaire Summary of Results

1.1 Demographic data

1. Choose your business unit.

Business Unit	No. of Respondents	% of total
Miningtek	10	22
Environmentek	3	7
Bio/Chemtek	33	71

2. Choose your age group.

Age	No. of Respondents	% of total
20-29	14	30
30-39	19	41
40-49	9	20
50-59	4	9
60-65	0	0

3. Choose your gender.

Gender	No. of Respondents	% of total
Male	25	54
Female	21	46

4. Choose your ethnic group.

Ethnic group	No. of Respondents	% of total
Black	5	11
White	32	71
Asian	7	16
Coloured	1	2

1 respondent did not answer this question.

5. What is your highest level of qualification?

Qualification	No. of Respondents	% of total
PhD	17	37
MSc	9	20
BSc (hons.)	5	11
BSc/BTech/ NHD	9	19
Diploma	6	13

6. Years of experience of scientists.

Experience	Number of Respondents	% of total
<3 yrs	6	13
3-10 yrs	22	49
10-20 yrs	10	22
>20 yrs	7	16

1.2 Questions Relating to Knowledge Workers and Job Satisfaction

7.1 Do you enjoy your job?

	No. of Respondents	% of total
Strongly disagree	1	2
Disagree	3	6
Neither agree or disagree	5	11
Agree	22	48
Strongly agree	15	33

7.2 Your derive pleasure from your association with co-workers?

	No. of Respondents	% of total
Strongly disagree	0	0
Disagree	2	4
Neither agree or disagree	4	9
Agree	29	63
Strongly agree	11	24

7.3 You enjoy high levels of freedom in your job?

	No. of Respondents	% of total
Strongly disagree	1	2
Disagree	4	9
Neither agree or disagree	8	17
Agree	18	39
Strongly agree	15	33

7.4 The knowledge work that you are involved in, are directed at perfection, not creativity?

	No. of Respondents	% of total
Strongly disagree	3	7
Disagree	14	30
Neither agree or disagree	16	35
Agree	11	24
Strongly agree	2	4

7.5 Scientists need to know exactly what they are doing well?

	No. of Respondents	% of total
Strongly disagree	1	2
Disagree	2	4
Neither agree or disagree	4	9
Agree	17	37
Strongly agree	22	48

7.6 You attain job satisfaction by obtaining knowledge itself?

	No. of Respondents	% of total
Strongly disagree	1	2
Disagree	2	4
Neither agree or disagree	8	17
Agree	16	35
Strongly agree	19	41

7.7 You attain job satisfaction by knowing a lot?

	No. of Respondents	% of total
Strongly disagree	0	0
Disagree	6	13
Neither agree or disagree	14	30
Agree	15	33
Strongly agree	11	24

7.8 You attain job satisfaction by manipulation of knowledge?

	No. of Respondents	% of total
Strongly disagree	3	7
Disagree	3	6
Neither agree or disagree	8	17
Agree	19	41
Strongly agree	13	28

7.9 You attain job satisfaction by creating new knowledge?

	No. of Respondents	% of total
Strongly disagree	2	4
Disagree	0	0
Neither agree or disagree	5	11
Agree	17	37
Strongly agree	22	48

7.10 You see your job as the source of a pay cheque or little else?

	No. of Respondents	% of total
Strongly disagree	15	33
Disagree	13	28
Neither agree or disagree	12	26
Agree	6	13
Strongly agree	0	0

7.11 You are familiar with your organisation's reward system?

	No. of Respondents	% of total
Strongly disagree	5	11
Disagree	5	11
Neither agree or disagree	11	24
Agree	19	41
Strongly agree	6	13

7.12 Organisational recognition and reward systems are sufficiently recognizing your contribution?

	No. of Respondents	% of total
Strongly disagree	15	33
Disagree	7	15
Neither agree or disagree	14	30
Agree	9	20
Strongly agree	1	2

1.3 Questions Relating to Non-monetary Rewards

8.1 Management can attract you by consulting, involving and encouraging learning.

	No. of Respondents	% of total
Very important	13	28
Important	24	52
Neither	3	7
Not Important	4	9
Not in the least important	2	4

8.2 Satisfaction and respect are incentives towards high performance.

	No. of Respondents	% of total
Very important	17	37
Important	22	48
Neither	3	7
Not Important	2	4
Not in the least important	2	4

8.3 Personal recognition, e.g. A simple Thank You.

	No. of Respondents	% of total
Very important	16	35
Important	24	52
Neither	1	2
Not Important	3	7
Not in the least important	2	4

8.4 Formal recognition of patents, publications, journal articles etc. from peers and top management by an award ceremony.

	No. of Respondents	% of total
Very important	11	24
Important	19	41
Neither	10	22
Not Important	5	11
Not in the least important	1	2

8.5 Recognition by Title.

	No. of Respondents	% of total
Very important	4	9
Important	8	17
Neither	11	24
Not Important	16	35
Not in the least important	7	15

8.6 Recognition for sustained technical excellence by awarding fellowships.

	No. of Respondents	% of total
Very important	14	30
Important	16	35
Neither	9	20
Not Important	2	4
Not in the least important	5	11

8.7 Formal recognition involving coupons for dinner for two.

	No. of Respondents	% of total
Very important	5	11
Important	8	17
Neither	18	39
Not Important	4	9
Not in the least important	11	24

8.8 Best publication award where funding is granted to further research/develop networks/attend a conference.

	No. of Respondents	% of total
Very important	14	30
Important	18	39
Neither	8	17
Not Important	2	4
Not in the least important	4	9

8.9 Conference attendance.

	No. of Respondents	% of total
Very important	21	46
Important	15	33
Neither	3	6
Not Important	4	9
Not in the least important	3	6

8.10 Training courses.

	No. of Respondents	% of total
Very important	15	33
Important	17	37
Neither	9	20
Not Important	3	6
Not in the least important	2	4

8.11 Overseas travel relevant to the field of experience.

	No. of Respondents	% of total
Very important	17	37
Important	19	41
Neither	3	7
Not Important	2	4
Not in the least important	5	11

8.12 Studies (graduate, post graduate).

	No. of Respondents	% of total
Very important	17	37
Important	15	33
Neither	9	20
Not Important	2	4
Not in the least important	3	6

8.13 Career advancement opportunities.

	No. of Respondents	% of total
Very important	21	46
Important	20	43
Neither	1	2
Not Important	2	4
Not in the least important	2	4

8.14 Additional technical support in developments.

	No. of Respondents	% of total
Very important	18	39
Important	16	35
Neither	9	20
Not Important	2	4
Not in the least important	1	2

8.15 More equipment and instrumentation.

	No. of Respondents	% of total
Very important	19	41
Important	19	41
Neither	5	11
Not Important	2	4
Not in the least important	1	2

8.16 Better office space.

	No. of Respondents	% of total
Very important	11	24
Important	6	13
Neither	14	30
Not Important	12	26
Not in the least important	3	7

8.17 Sabbaticals

	No. of Respondents	% of total
Very important	16	35
Important	11	24
Neither	13	28
Not Important	3	6
Not in the least important	3	6

8.18 More vacation time

	No. of Respondents	% of total
Very important	12	26
Important	9	20
Neither	15	33
Not Important	7	15
Not in the least important	3	6

8.19 More flexibility in work assignments.

	No. of Respondents	% of total
Very important	12	26
Important	21	46
Neither	10	22
Not Important	2	4
Not in the least important	1	2

1.4 Questions Relating to Monetary Rewards

9.1 Pay based performance, which ultimately leads to variable pay.

	No. of Respondents	% of total
Very important	15	33
Important	12	26
Neither	11	24
Not Important	5	11
Not in the least important	3	6

9.2 Merit Bonus.

	No. of Respondents	% of total
Very important	21	46
Important	19	41
Neither	4	9
Not Important	1	2
Not in the least important	1	2

9.3 End of year awards of monetary value, a voucher/gift.

	No. of Respondents	% of total
Very important	16	35
Important	19	41
Neither	6	13
Not Important	5	11
Not in the least important	0	0

9.4 Car allowance or benefits.

	No. of Respondents	% of total
Very important	17	37
Important	15	33
Neither	8	17
Not Important	4	9
Not in the least important	2	4

9.5 Cell phone allowance.

	No. of Respondents	% of total
Very important	8	17
Important	8	17
Neither	18	39
Not Important	7	15
Not in the least important	5	11

9.6 Special interest rates.

	No. of Respondents	% of total
Very important	16	35
Important	14	30
Neither	11	24
Not Important	3	7
Not in the least important	2	4

9.7 Salary increase, generally once a year.

	No. of Respondents	% of total
Very important	30	65
Important	10	22
Neither	3	6
Not Important	0	0
Not in the least important	3	6

9.8 Profit sharing.

	No. of Respondents	% of total
Very important	22	48
Important	14	30
Neither	8	17
Not Important	1	2
Not in the least important	1	2

9.9 % of Total Cost of Earnings

	No. of Respondents	% of total
Very important	17	37
Important	14	30
Neither	15	33
Not Important	0	0
Not in the least important	0	0

9.10 Stock options.

	No. of Respondents	% of total
Very important	11	24
Important	5	11
Neither	22	48
Not Important	4	8
Not in the least important	4	8

9.11 Small monetary payments for all patents, publications.

	No. of Respondents	% of total
Very important	18	39
Important	17	37
Neither	7	15
Not Important	3	7
Not in the least important	1	2

9.12 Large outstanding patent, publication and bonuses.

	No. of Respondents	% of total
Very important	21	46
Important	13	28
Neither	8	17
Not Important	1	2
Not in the least important	3	7

1.5 Open Ended Questions

10. What aspect of your job do you enjoy the most?

	No. of Respondents	% of total
Research and innovation	12	26
Creativity and expressing new ideas	7	15
Problem solving and new challenges	6	13
Freedom to approach and do their work	5	12
Non-routine work, variation of projects	3	7
Learning new info	3	7
Client interaction	3	7
Hands on work bench work	2	4
Achieving an aim	2	4
Flexible working hours	1	2
Travel	1	2
Teamwork	1	2

11. What allows you to attain job satisfaction?

	No. of Respondents	**% of total**
Contributing technically and strategically to the organisation. Making a difference and knowing that their input is adding value.	16	35
Working environment conducive to high performance standards. Working space, atmosphere, freedom and appreciative environment.	10	22
Recognition for good performance.	7	15
Learning from peers	3	7
Enough time to complete work	3	7
Flexibility in working hours	2	4
Leadership	1	2
Study further	1	2
Peers at work	1	2
Clear growth prospects	1	2
Knowledge contacts	1	2

12. Which is of greater value to you, monetary or non-monetary reward?

	No. of Respondents	% of total
Monetary reward	21	46
Non-monetary reward	9	19
Both	15	33
No comment	1	2

13. What are the shortcomings of the reward system in your organization?

	No. Respondents	% of total
No real system, not aware of the reward system.	12	26
Rewards are relatively small. Organisation is not keen on paying bonuses.	11	24
Management is inconsistent in granting bonuses. Management is not aware of good performance.	8	17
No recognition for innovation. The reward process is not run by technical people.	6	13
Does not focus on individuals.	3	7
Reward system should be applicable at all levels.	2	4
Incentive scheme drives wrong behaviour.	1	2
Profit sharing incentives is a nice addition.	1	2
Predicated on the fact that cash is the only incentive.	1	2
None	1	2

14. Do you have any suggestions on how your organisation's reward system can be improved?

	No. of Respondents	% of total
Increase in monetary rewards.	10	22
None	8	17
Introducing profit sharing.	5	11
Technical rewards based on innovation. More acknowledgement required.	5	11
Team bonuses are a good idea.	4	9
Question was unanswered.	3	6
Clear goals.	3	6
More frequent rewards.	3	6
Management should understand what motivates the individual.	2	4
The organisation must learn to measure value in a unique industry.	1	2
360 degree feedback system is good.	1	2
Development of people in lower management.	1	2

APPENDIX D

PLANNING AND DEVELOPMENT DISCUSSION OF A TEAM

(Sydänmaanlakka, 2002:221)

NAME OF TEAM: ----------

UNIT/DEPARTMENT: ----------

NAME OF THE MANAGER AND JOB: ----------

(The direct superior of team, e.g. Team Leader)

APPROVAL OF THE SUPERIOR: ----------

(After filling the form the superior and team members approve it by signing)

Names of team members	Approved

NEED TO BE UPDATED AT THE LATEST: ----------

A. THE MAIN PURPOSE OF A TEAM

Define with one sentence why the team exists and what the vision of the team will be.

B. TEAM'S CUSTOMERS

Who are the customers? What kind of services does a team offer for them? In addition to external customers a team has also internal customers, e.g. a team performing the next phase. Team's customers are everyone a team offers services and products.

Customers	Team's product and service

Whose customer is a team? Who is supplying products or services to a team? Supplier is e.g. a team performing the previous work phase.

Supplier	The product or service a team gets

C. KEY TASKS, OBJECTIVES AND SUCCESS MEASUREMENTS

What are the most important tasks of a team? What are the objectives of a team? How do we measure the success of a team? Who is monitoring the achievement of the objectives? How often?

Task	Objective	Meter
1.		
Person following the realisation of the objective.		
2.		
Person following the realisation of the objective.		
3.		
Person following the realisation of the objective.		

D. THE COMPETENCY NEEDED IN A TEAM

What kind of knowledge, skills and attitudes are necessary for a team to achieve good results? What kind of special skills are needed?

Knowledge:
Skills:
Attitudes:

E. THE WORKING CONDITIONS OF A TEAM

What kind of tools and authority does a team need to achieve it's objectives? Which are the possible risks? What sort of factors could prevent a team from achieving its objectives?

F. THE DEVELOPMENT PLAN OF A TEAM

How is a team developing its competency and multi-competency during the next planning period? Write down the concrete actions.

Development needs	Persons	Realisation	Timetable

G. STEERING/COACHING OF A TEAM

How is operation of a team steered? Who or what is steering? What a team expects from steering?

H. THE RULES OF A TEAM

A team defines its own rules about how best to solve problem situations. These rules are always updated when needed.