# Resistance to Technological Change within a Manufacturing Context

By

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# Confidentiality Clause

31 December 2004

To whom it may concern

*Re: Confidentiality Clause*

Due to the sensitive nature of the information of this research it would be appreciated if the contents remain confidential and not circulated for a period of five years.

Sincerely

**VS Ramnarian**

# Declaration

I declare that this research has not being previously accepted for any degree and is not being currently submitted in candidature for any other degree. In addition, all work with the exception of references is my own.

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VS Ramnarian

13 January 2005

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# Abstract

Despite the predominantly negative perception that resistance adversely affects a change process, understanding it may be used to successfully implement many changes in organisations. This qualitative study identified inhibitors and enhancers, as perceived by employees with respect to the proposed implementation of a Human Resource Information System technology, at the adaptive and high-adaptive change levels. This issue was examined in the context of large-scale manufacturing company Hulett Aluminium. Based on a review of change theory, innovation diffusion and technology adoption models variables known to relate to technology change were identified and used to formulate a research framework. A quantitative computer attitude survey was initially used to identify a more representative sample frame, after which semi-structured interview techniques were utilised to collect data from eleven general employees and seven Human Resource employees. Qualitative data was analysed using content analysis, domain analysis and the constant comparative concept taken from grounded theory.

The findings of this study identified clear communication and employee participation as crucial factors in implementing change at any level. The technology characteristics relative advantage, compatibility and complexity were prominent between both samples. Relative advantage was found to mediate time availability and social influence. Respondents believed trialability allowed them to become familiar with the technology. The support factor training was also dominant and found to mediate respondents' anxiety and uncertainty. The theme that computer experience mitigates anxiety was also evident. Owing to experience of poor technical support, respondents' cited it as an important variable in resistance to technology, which is evident of how experience influences perspective. This study allows researchers and change agents to understand the role individual, technological, propagation and external factors have in employees' perceived resistance to adoption of the proposed technology. By accurately gauging resistance in advance, change agents can anticipate the likely response of the organisation and thus implement appropriate strategies. The research also adds to the expanding base of research investigating resistance to technology adoption in general.

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# CHAPTER 1

In this chapter an introduction and background to this research is provided. The chapter presents the rationale for this study and defines its research setting. It then proceeds to formulate the research problem and objectives. Next limitations of this study are stated, an overview of the research methodology is presented and a structure of the dissertation is illustrated.

## 1. Introduction

This qualitative study is intended to help identify resistance to change experiences of employees, from an adaptive (change that is not considered particularly threatening) and high-adaptive (change that is generally unfamiliar and may be perceived as threatening to a few) technology change perspective. The issue was examined in the context of large-scale South African manufacturing company, Hulett Aluminium. The technology in question relates to a proposed integrated Human Resource Information System (HRIS). The study defines the HRIS technology change as adaptive with respect to general employees, who will interface with the system at a very general level, for example, entering of administrative tasks such as leave directly into the system. The HRIS technology change is defined as high-adaptive with respect to HR employees, who will interface with the system for both general and more specialist tasks such as trend analysis, database manipulation, remuneration planning and other related applications. Thus, this study comprises two distinct levels of change and two distinct "populations".

There have been numerous studies describing the changes expected to occur in the workplace of the 21st century. One such change is technology, specifically Information Technology, which is revolutionising the workplace environment. In this age of information, technology is at the forefront in the way people work and communicate. No longer is money the only criteria for firms to survive. Challenges such as global competition, technology innovation and customer service persist more so today than any other era (Kaber, 1998). Hence, in order to survive, companies must form an Information Technology infrastructure that is incorporated into their organisational strategies.

One of the significant benefits attached to computer technology has been its capability to produce improvements in efficiency and effectiveness for both individuals and organisations. Many organisations have begun to implement Enterprise Resource Planning technology and Human Resource technology to help streamline business processes and allow rapid response to environmental changes through real-time information. However, like most technology change initiatives, success rests not just in implementing the change, but also in the willingness of employees to accept, adopt and use computers and other technology.

Organisations must realise that in order to implement change they must consider the change from the perspective of those affected by the change. In addition, the fixed-costs of establishing these technology initiatives is generally high, thus if the adoption process is slow, the payback of the investment is delayed. Why do employees resist technological change? Aladwani (1998) suggests that the first step in effectively managing change introduced by IT is to identify and evaluate the attitudes and perceptions of potential users.

Based on change management and classic technology adoption theory, this study attempts to identify what factors of technology change rate as important among the two populations (general employees and HR employees), therefore offering hints about factors organisations should pay special attention to when initiating a similar technology change process. Understanding the possible reasons for resistance to this change, at both levels, allows management to plan how to address them and assists in more effective communication of the change, thus making it easier to sell. In addition, this study checks whether the sources of resistance resulting from the literature review agree with those discovered in this study.

## *1.1 Background*

This section provides a background of resistance to change and the myriad of factors that are involved in a technology change such as the HRIS at Hulett Aluminium. It provides the reader with the knowledge required to understand the research problem and purpose of this study.

Carson (1998) identifies three types or degrees of change:

> ➢ Adaptive change involves reimplementation of a change in the same organisational unit at a later time or imitation of a similar change in a different unit. This change is not considered particularly threatening.

> ➢ Innovative change involves changes that are generally unfamiliar, and as such, create greater uncertainty and fear in organisations.

> ➢ Radically innovative change is the most intimidating type of change and as such is the most resisted type of change in organisations.

Many authors (Maurer, 1996; Waddell and Sohal, 1998) cite that the reasons for the failure of many change initiatives reside in employees' resistance to change. Resistance to change introduces costs and delays into the change process (Ansoff, 1990) that are difficult to anticipate. Resistance has also been considered as a source of information, proving useful in learning how to develop a more successful change process (Piderit, 2000; Waddell and Sohal, 1998). Hence, understanding resistance to change is fundamental in change management to help the organisation achieve the benefits of the transformation. This implies that the first step for Hulett Aluminium in its introduction of the HRIS is to understand factors employees perceive as resistance to the change.

Resistance to change is effectively the product of an individual's perception of the degree of difficulty in changing. Ultimately, the key elements in determining the success of organisational changes are the attitudes and behaviours of the individuals in the organisation charged with implementation (Herold et al., 2002). Researchers' have a reasonable understanding of how organisations deal with their environments and how

change management processes can affect the consequences of specific changes. In contrast, little is known about how individuals perceive organisational changes. If management does not understand, accept and make an effort to work with resistance, it can result in even the most well-intentioned and well-conceived change efforts failing.

A more complex interaction of individual, social, economic and organisational factors influence which technologies are adopted and their usage after adoption (Rogers, 1995). Most technology adoption studies have confined their research scope to only examine either the psychological perspective of factors (Sexton and Meyerson, 1999; Olech, 1997), or the external or environmental perspective of factors (Groves and Zemel, 2000), disregarding other relevant variables (in Park, 2003). However, in reality an individual will be influenced by psychological and environmental factors simultaneously for a decision to adopt or use a technology. Hamilton and Thompson (1992) (in Park, 2003) asserted "personal characteristics of adopters in a social system and their perceived value of the innovation" have a huge influence on the degree of diffusion of an innovation.

The above backdrop conveys that single factor measurements are inappropriate to understand employee resistance to the HRIS and as such, requires one to understand employee perception of the change. Thus, factors of resistance to technology adoption may arise from psychological, social, technological, organisational and other external sources. Owing to this diversity, this study formulates a research framework incorporating variables from the perspectives of individual characteristics, the perceived attributes of the technology, and the perceptions of external influences such as organisational and social to provide a more complete understanding of resistance to the HRIS technology change. A search of models toward that end led to the selection of four models that seemed to be relevant and empirically validated: the classic Diffusion of Innovation (DOI) model (Rogers, 1995), the Model of Technology Resistance (Ram, 1987), the Theory of Reasoned Action (TRA) model (Ajzen and Fishbein, 1975), and the Technology Acceptance Model (TAM) (Davis, 1989).

## 1.2    Definition of Key Terms

To clarify the objectives and research questions posed in this study, several terms need to be defined more fully:

*Change management*

Is the process of developing a planned approach to change in an organisation. Typically the objective is to maximise the collective efforts of all people involved in the change. Change management can be reactive, in which case management is responding to changes in the macro environment (i.e. the source of the change is external). On the other hand, change management can be proactive, in which case management is initiating the change in order to achieve a desired goal (i.e. the source of the change is internal) (Available online at http://en.wikipedia.org).

*Perception*

How individuals generate information about the world or objects is termed perceiving. When new information is compatible with their knowledge structures it is accepted, when it does not mesh with their pre-conceived ideas or past experience it receives little consideration, is distorted or ignored.

*Attitude*

Attitude is a person's positive or negative perception about performing a behaviour e.g. adopting a new technology (Ajzen and Fishbein, 1975).

*Self-efficacy/Confidence*

The belief that an individual has in their ability to organise and execute the courses of action required to produce given attainments (i.e. an individual's perception of his own competence in making decisions and carrying them through) (Bandura, 1997).

*Computer Liking/Enjoyment*

Represents how well one likes computers and enjoys computer work (Gressard and Loyd, 1986).

*Computer Anxiety*

Reflects uneasiness about computers and/or learning to use them (Gressard and Loyd, 1986).

*Perceived Usefulness*

Reflects the extent to which an individual perceives computers and/or learning of computers to be of value in achieving personal or other tasks (Davis, 1989).

*Perceived Ease-of-use*

Defined as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989).

*Relative Advantage*

Is the degree to which a technology is perceived as being of benefit, either economical, timeliness or other benefit (Rogers, 1995).

*Complexity*

Refers to the degree of perceived difficulty in understanding or using a technology (Rogers, 1995).

*Perceived risk*

Represents an individual's fears about loss among financial, performance, social, psychological security and convenience that the technology may cause and is therefore a multidimensional construct (Ram, 1987).

*Compatibility*

Refers to the degree to which the technology is perceived as consistent with the individual's values and needs (Rogers, 1995).

*Motivation*

Is a general term used to encompass perceptions about task difficulty, task worth, willingness to stay on task and task enjoyment.

*Prior computer use/experience*

For the purposes of this study, 'prior computer use' refers to the number of times employees' use computer technology, which includes work computer applications, plant automation technology, the Internet and e-mail.

*Technophobia*

Is defined as a fear of technology. Related to technophobia is the notion of cyberphobia. The term cyberphobia has been used to describe those who have a fear of computers specifically, the fear and/or inability to learn new technologies (Brosnan, 1996).

## *1.3    Research Setting*

### 1.3.1.  Company Background

Hulett Aluminium (Pty) Limited is established as an independent supplier of high quality aluminium semi-fabricated products to the global market and is ideally placed to capitalise on its achievements as a quality supplier in an industry increasingly dominated by three large, multinational producers. Hulett Aluminium (Pty) Limited comprises a subsidiary of the Tongaat-Hulett Group, which consists of four business units namely: Tongaat-Hulett Sugar, Hulett Aluminium, African Products and Moreland.

The company comprises seven business units and employs 1298 individuals. In November 2000, Hulett Aluminium (Pty) Limited commissioned the R2.4 billion expansion of its rolled products facility, lifting capacity from 54 000 tons to an estimated maximum of 200 000 tons per annum. This major investment for Tongaat-Hulett was a significant milestone in its vision of creating an export orientated aluminium rolling business. Hulett Aluminium (Pty) Limited is an independent low cost manufacturer of sophisticated high value semi-fabricated aluminium products and, as a result of its small worldwide market share, is flexible with respect to its product mix. Today, the organisation boasts over 250 customers in more than 60 countries around the world. Hulett Aluminium (Pty) Ltd's major products comprise:

> Can-end stock (a thin gauge and hard alloy product)

> Aluminium Plate

> Aluminium Foil

> Aluminium Structural Materials, for example, roof sheeting and beams.

> Growth in other higher value products, such as painted sheet and automotive clad products, has also been undertaken.

The Group emphasises a decentralised management approach with people at operating centres taking greater responsibility for their performance. The Group intends capitalising on the opportunities to grow and to increase the return on capital employed, utilising its strong asset base and the capabilities of its people (Available at http://thg.co.za).

### 1.3.2. Motivation and the HRIS

Hulett Aluminium's motivation centres on facilitating the success of future technology related initiatives, which for the context of this study is the proposed integrated Human Resources Information System (HRIS). For this change to have a positive impact it is essential that the management team be proactive in its response by anticipating the impact of change, provide focus and direction during change, manage anxiety through change and to develop strategies to successfully battle resistance to the change. Understanding the factors that employees consider as inhibitors or enhancers to this technology adoption is a starting place to assess the organisation's current level of readiness for this change. In addition, the fixed-costs of establishing these technology initiatives is generally high, thus if the adoption process is slow, the payback of the investment is delayed. Thus, facilitating the adoption of a technology yields numerous benefits in terms of time, financial and other costs.

Owing to Hulett Aluminium's intense expansion the company's Services department identified the need for a new integrated Human Resources Information System, owing to the inadequacy of the existing systems to meet present and future business requirements.

The proposed solution: Migrate HR system processes and procedures into an electronic medium, which will accommodate future business strategies, empower employees and introduce efficiencies in business processes. The new system is expected to increase the timeliness and accuracy of employee data, assist in streamlining people management processes, provide management and employees with direct and easy access to information and, obtain significant cost benefit. In addition, the system will provide HR employees and managers with information and appropriate tools to manage the workforce strategically aligning its people management practices with the 'best in class'. The abovementioned benefits ultimately equate to an optimised cost-effective HRIS operation impacting positively on the company's bottom-line.

From the above backdrop, it is evident that the proposed HRIS change affects two distinct employee levels:

1. General employees – defined as those individuals using the HRIS to perform general tasks such as leave application and travel requisitions.

2. HR employees – defined as individuals utilising the HRIS to perform more strategic tasks such as planning and modelling.

### 1.3.2.1.   User Benefits of the HRIS

General employee benefits include:

> Self-service and management of company benefits such as leave, travel expenses and skills development.

> Online real-time information on benefits, such as, pension fund performance.

> Access to current HR and other service procedures, for example, medical-aid procedures.

> Convenience: application submission and approval efficiencies.

The vision is that employees will be equipped with usernames and passwords, and able to access the system via an organisation Intranet portal at various base stations. Tasks performed by the general employee population will mimic those that the individual uses

at present, for example, filling out a leave form will have the same format, but just done electronically instead of on paper. Therefore, the degree of change for this population is considered as adaptive (i.e. change involving reimplementation and is not considered particularly threatening). At this point it is important to note that at the time of writing this dissertation, this was the vision held by the organisation. The organisation foresees eventual use of this system by all employees.

HR employees' benefits include:

> Instant access to real-time business and employee records and procedures.

> More control through employee trend analysis and flagging of company benefit "abuse".

> Controlled modification to HR procedures, employee records and other database sensitive data.

> Improved quality of HR planning activities through the support of business tools such as "What-If" analysis and other related modelling capability, such as remuneration planning tools.

> Reduced HR service process and costs due to a reduction in duplicated data, data entry and data verification processes.

> Less "paper pushing" i.e. administrative tasks taking up valuable time may now be spent on other job critical tasks.

HR employees will be expected to use the HRIS more intensively for both general and strategic tasks. Access to the system will be the same as that used by general employees, with the exception that the level of access and tools available to this population is much more extensive. Thus, the degree of change for this population is considered as being at the high–end of adaptive change, referred to as high-adaptive in this study. High-adaptive change is defined as change that is generally unfamiliar and may be perceived as threatening to a few individuals.

### 1.3.2.2. Knowledge of the HRIS Initiative

It is important to note that the concept of this HRIS initiative is oblivious to all employees (general employees and HR employees) except top management and the researcher. As such, the study need not compensate for influence in respondents' answers owing to rumour or other secondary sources of information. It is noted that the "rumour mill" expands rapidly and therefore in an attempt to minimise context contamination interviews will be conducted within the shortest possible time frame. All participants in this study will be introduced and provided with the HRIS context and its relation to their job through a standard simple, one-page document during their interview (the researcher will assist respondents in clarifying any issues of difficulty or misunderstandings that may arise). Thus, all responses will occur relative to a constant context. This will help ensure that respondents are free of context bias, which may skew responses and therefore results. These documents will explain the need for and the role the interviewee is expected to play with respect to the HRIS. Owing to different uses of the HRIS for general employees and HR employees, their respective context documents will differ. The general employee and HR employee context documents are presented in Appendix B and Appendix C respectively.

### 1.3.2.3. Technological Support

Technological support for the HRIS is envisaged as being comprised of a support hotline to be manned by trained staff. The hotline will consist of two departments, a technical support department to address technical issues and an application department to assist users with using the applications. Workshops will be held at various times that will explain the basic operation of the system to general employees. Supervisors will also be expected to attend a slightly advanced course to assist their teams. It is expected that HR employees undergo a training program that delineates the advanced applications of the system. The issue of technological support will not form part of the context talks. This approach is taken to allow participants to express their views on the importance of technical support (i.e. does it form an resistance factor) and the type they prefer. Thus the above vision may change depending on findings in this study.

## *1.4 The Problem Statement*

Computer technology introduced huge promises for organisations to improve performance and efficiency. However like most change initiatives, the success of technology in organisation's rest in the employees' willingness to accept, adopt and use computers and other technology. The purpose of this study is to identify what factors general employees and HR employees perceive as inhibitors or enhancers to the adoption of the proposed integrated Human Resource Information System (HRIS). Based on the above discussion, the research problem is expressed as follows:

1. What are the factors that general employees consider as important inhibitors or enhancers to the HRIS technology adoption (adaptive change level)?

2. What are the factors that HR employees consider as important inhibitors or enhancers to the HRIS technology adoption (high-adaptive change level)?

3. How does knowledge of the HRIS change context affect factors of technology adoption? That is, when respondents answer the general computer attitude survey they do so within a specific context, which gives rise to certain concerns or perceptions. By comparing the inhibitors they had when answering the general attitude survey to those after the HRIS context is explained, allows us to gauge roughly the extent to which knowledge of the change context influences resistance factors.

4. What level of social influence do HR employees exhibit from co-workers and friends with respect to the proposed HRIS technology?

The answers to the research questions, provided in the conclusion of this work will provide Hulett Aluminium management with insights into the HRIS change and change in general. This will help management to formulate specific strategies to better manage the change based on primary information from those responsible for implementation at both change levels namely, general employees and HR employees. In addition, findings will provide information that will be useful in selection of areas for future qualitative research, as well as establishing topics for quantitative research.

## 1.5 Objectives of the Study

➤ To identify factors management can modify to facilitate smooth and successful transition to the HRIS technology change. (Research Q1 and Q2)

➤ To assess the extent to which knowledge about the change initiative and its relative advantages affects the inhibiting factors to the HRIS technology adoption. (Research Q3)

➤ To establish the level of social influence HR employees exhibit from co-workers and friends with respect to the HRIS technology? (Research Q4)

➤ To establish a base study for future research into factors Hulett Aluminium employees' consider as key inhibitors or enhancers toward similar technology adoption.

➤ To gain an appreciation that the adoption of technology is a complex process involving a variety of factors.

## 1.6 Value of the study

This study is the first technology change study conducted by Hulett Aluminium. Therefore this study is crucial in that it responds to the void of quantitative and qualitative data in this domain. In addition, this study establishes bounds for future research within this field. The role of computers in the workplace has become increasingly important during the last quarter of the 20th century and presides today. Owing to the crucial role of computers in the workforce through assisting companies attain a competitive advantage it has become increasingly necessary for employees to be proficient in adopting and applying technology related skills. Thus, in an effort to further understand resistance to change and the key factors that influence technology adoption, within an industrial environment, the present study builds on past research to determine which individual, technological and external factors form key inhibitors or enhancers to the HRIS technology change.

Resistance is often perceived negatively and employees who resist are viewed as obstacles that the organisation must overcome in order to achieve their new goals. However in certain instances, employee resistance may play a positive and useful role in organisational change. Insightful and well-intended debate, criticism, or disagreement do not necessarily equate to negative resistance, but rather may be intended to produce better understanding as well as additional options and solutions (Bolognese, 2002). Employee resistance may force management to rethink or re-evaluate a proposed change initiative, allowing organisations to choose from all possible changes the one that is most appropriate to the current situation. This is precisely the intent of Hulett Aluminium's management. These implications could also be of value to the manufacturer and vendor of technology systems.

## 1.7 Research Design

This study uses a cross-sectional two-prong approach set within manufacturing company Hulett Aluminium (Pty) Ltd.

**Quantitative study**

With respect to the general employee population, which is significantly larger (1280 employees) than the HR employee population (18 employees), conducting probability sampling allows the possibility of ending up with a sample that has neither concerns nor optimism for the HRIS change i.e. employees that are sitting on the fence. Such a sample will thus diminish the value of this study i.e. the study may not be able to identify inhibitors or enhancers to the change. To minimise this particular situation, a simple quantitative survey instrument that measures attitudes to computers in general using a Likert scale was distributed.

This approach allows employees with poor attitudes and those with good attitudes towards computers (i.e. the extreme groups) to be identified. Now using these two "extreme" groups from the findings of the quantitative aspect of this study provides a sample frame for the qualitative study. It is assumed that these respondents with the poor attitudes and good attitudes to computers will provide the most useful insight to factors

that inhibit or enhance technology adoption. Hence making them the best people to study in order to answer our research questions. Note that even at time of administering this survey instrument, no information regarding the HRIS was disclosed, thus preventing context contamination.

**Qualitative study**

The qualitative study, which uses semi-structured interview instruments, allows us to answer the research problem. Given that the study comprises two distinct populations, two interview scripts were formulated based on the two levels of change. With respect to the HR employees, a judgmental sample was taken based on the criterion of job tasks in order to obtain a diversity of inputs from all possible users of the HRIS. Qualitative data from the interviews was analysed using content analysis, domain analysis and the constant comparative concept taken from grounded theory. In addition, triangulation was applied to a small extent.

To measure the level of social influence experienced by HR employees, the social influence Likert scale instrument utilised by Malhotra and Galletta (1999) was adopted. A total of 18 interviews were conducted, seven among HR employees and 11 among general employees. It must be noted that because my intent was to identify inhibitors or enhancers that not only predicted chance of success but also provided a tool for improving chances of success, I choose only factors that were modifiable and related to successful implementation.

## *1.8    Limitations of the Study*

A number of constraints served as limitations in this study. These included the following:

> ➤ The most important limitation of this study is to note that perceptions to change depend on the degree of change and research context. In this instance two levels

of change exist, one classified as adaptive and the other high-adaptive. (Carson, 1998).

➢ The rapid evolution of technology and its growing prominence in our lives implies that this study holds true for a limited time period only i.e. applying the results of this study is only appropriate for say the period 2003-2006. A study done in say five years from now may display very different results.

➢ This study is delimited to the large organisational context of Hulett Aluminium and its employees.

➢ Like most qualitative-orientated studies, the information provided by respondents and the interpretation by researchers cannot be completely eradicated of bias.

➢ The Likert scale as an interval scale. The Likert scale allows the ranking of participants relative to their measured attitude toward a social object. It does not provide interval data indicating the relative difference between participants' responses or changes in attitude over time (Burns, 1997).

➢ The Hawthorne Effect: with all new activities, the Hawthorne Effect may initially explain individuals' response to an activity i.e. the activity may involve something that individuals do not often do and is thus seen as a 'novelty'. This, in turn, may influence individuals' perceptions and possibly attitudes to the social object (Whitrow, 1999). It is possible that some results obtained in this study were influenced by the Hawthorne effect.

## 1.9    Thesis Overview

This study analyses what factors form key inhibitors or enhancers among general employees and HR employees to the proposed HRIS computer technology initiative. This chapter has introduced the study, discussed the objectives, significance and research questions, described the research setting and discussed limitations. The next chapter is a literature review of previous research associated with resistance to change and technology adoption. In summary Chapters 1 and 2 provide the basis on which the present study was founded and designed. Chapter 3 delineates the methodology and procedures associated with the study, while the fourth and fifth chapters present, discuss

and conclude the findings of this study. Further research areas are also identified and proposed in the final chapter.

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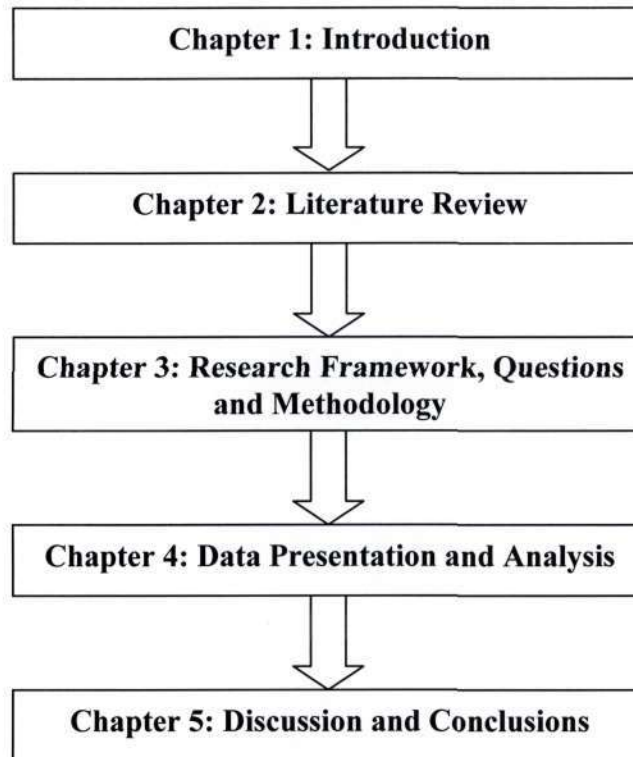
Figure 1.1: Thesis Outline         Source: Author's

## CHAPTER 2

## 2. Literature Review

This chapter conveys the study's importance and examines literature related to our research problem. The theory is initially discussed in general and then moves to the specific issues in the related research context. The chapter reviews theory related to resistance to change and key models of technology adoption and how perceptions and attitudes affect behaviour. The concept of attitudes is defined and their influence on behaviour thereby providing background knowledge for the use and implementation of the attitude tools in this study.

### 2.1 Importance of the area being researched

Owing to the efficiency and cost cutting measures that computers provide in the workplace, competence in using them has become not only an advantage, but also a necessity (Whitrow, 1999). As the workplace product transforms from paper to information services, employers and employees scramble to keep abreast of the large volume of information and the new service opportunities created by the innovations in technology available to business.

With the advent of globalisation, organisations such as Hulett Aluminium find themselves under further pressures to change continuously, reduce costs, utilise resources more effectively and provide first-class customer service in order to obtain a competitive advantage. Companies now realise that employees form their most vital asset and thus, investment in improving company skills, especially with regard to company technology use, provides a lifeline in today's dynamic and competitive business environment. Therefore management, including that of Hulett Aluminium, need to understand resistance to technological change to optimise and ensure an effective change process with respect to new technology initiatives such as the HRIS.

## 2.2 The Role of HRIS in SA

Management of people is a critical lever to achieve strategic business objectives. The current rate of economic, competitive, and political change demands cost flexibility in all administrative functions. The mandate for the HR function is to work better, faster and cheaper, and to still make time for strategic planning. This section discusses the role of HRIS in South African business as illustrated by Sacht (1998) and applies to the context of Hulett Aluminium. HR at companies now have more confidence that automated systems can do what they want, and more companies are either upgrading their systems or buying their first one to cope with continuously changing scenarios arising from a turbulent business environment. Many smaller companies are finding that they have to move beyond just having personnel files to becoming more strategic to compete for scarce talent and retain talented staff. This requires quick access to information. For example, you need to see the staffing game plan, and in the light of affirmative action and financial goals be able to model various staffing scenarios and what these will cost the company.

Previous HR related tasks are shifting to managers and to employees. South African labour legislation has put the responsibility of people issues on the shoulders of line managers. The challenge for HR will be to take on a partnership role and to have a policy and paperwork framework and system in place that makes it easy for employees and line managers to take on many of the administrative tasks previously handled by HR. Examples of this partnership include:

➢ Training administration - having the appropriate policies and procedures at hand for all training supplied by the company, and for managers and employees to be able to schedule people to attend courses without constantly conferring with HR about policy and paperwork. In future this will be available on the web or the company Intranet.

➢ Performance management policies, procedures, schedules of events and having online electronic appraisal documentation available for use throughout a performance and budget cycle. In future it is envisaged that an HRIS will

automatically alert managers and employees to critical appraisal tasks that need to be completed and will automatically generate the supporting paperwork.

➢ Creating a policy, procedure and paperwork framework. Creating an online policy, procedure and paper flow system is the logical starting place for upgrading current systems to an automated HRIS.

➢ Employee self-service - Pressure from the stock markets and from top management to cut costs will accelerate the self-service trend. HR professionals are looking to do more sophisticated forms of self-service, beyond such tasks as checking on the true value of pension fund contributions, requesting time off and study leave. Moving these kinds of duties away from HR not only saves time and money, but also increases employee satisfaction. In a recent study, The Society of Human Resources Management in the US, found that nearly five out of every eight hours of an HR professional's time is spent doing administrative work. If you ask employees what health benefits they have, they won't be sure. With self-service, for example, they can log on to a computer and see when they qualify for a preventative doctor's exam.

➢ Aids, skill loss and succession - As demographics change due to HIV and AIDS related early retirement or death, employers increasingly are concerned about how they are going to replace these skilled employees. In many parts of the country there is only a small labour pool of qualified workers to replace them with. This is where training and development will have to fill the gap with fast track learning. A robust HRIS enables scheduling hundreds or thousands of hours of training for its employees, the ability to track skill development and ensure that that training is in line with NQF requirements and company business plan.

➢ Today having a clear line of succession is not a nice to have but is becoming a necessity. HR will need to identify which employees need certain technical skills, who needs supervisory skills, management skills, and leadership skills, and so on. Today's HR professional must have a system that can help you learn about these skills and will allow you to track the courses that employees take to build skill portfolios.

> ➤ Return on Investment (ROI) - During this period of slow economic growth in SA, HR is under more pressure to prove that its systems are an investment that will pay off, and not just an additional cost. This includes more than just time that HR spends at tasks such as manipulating. It also includes the time and energy that employees spend on tasks such as changing their address for health, which can be automated with an HRIS. Using an HRIS facilitates decision-making by allowing the company to better understand which employees leave the company and why. HR can also use the system to see which benefits are more popular, and then use that information to scrap unpopular benefits and add well-liked plans. This improves employee satisfaction. "It's all about ROI."

The trend toward more self-service, as well as HR systems hosted online, enables employees and managers to do more of HR's administrative work. Sacht (1998) warns that HR professionals who want to maintain control aren't always pleased with this change. However, he also emphasises that if the HR department still sees this control as necessary, "the firm desperately needs a new HR department to help take its business forward". The reward for HR now resides in obtaining faster and better data for recruiting, retention, and training initiatives. Ultimately it is all about profit and one of the ways to help the bottom line is to improve the speed and efficiency of processing HR transactions.

## 2.3 Change Theory

The focus of this study was to identify inhibitors or enhancers to change as perceived by general employees and HR employees toward Hulett Aluminium's proposed HRIS technology. This section discusses important common factors involved in most if not all change initiatives, including the HRIS change. Change we are told is the only constant in today's turbulent marketplace. In order to survive in this competitive environment it is necessary for organisations to evolve with and be prepared for these changes in the marketplace. Change management helps companies predict, institute, guide, facilitate and evaluate change. Forces of change stem from any number of events either from outside or within an organisation. External forces include those of the PEST analysis: Political,

Economic, Social and Technological (Robbins and Decenzo, 2001). For example, technological breakthroughs may either enhance or destroy the competence of firms in an industry. Internal forces comprise organisational culture (the general conditions within organisations, and consists of shared values, norms, beliefs, and assumptions that unite members of an organisation) (Carson, 1998). Change forces bring shifts in norms, values, beliefs and behaviours. With respect to Hulett Aluminium, forces of change stem predominantly from internal inefficiencies.

### 2.3.1 Resistance to Change

**What is Resistance?**

Piderit (2000) defines three different emphases in conceptualisations of resistance: as a cognitive state, as an emotional state and as behaviour. The idea that employee resistance may be cognitive suggests that beliefs play a role in resistance. Previous studies acknowledged anxiety, aggression and frustration in employees as the emotional factors that caused undesirable behaviours and resistance to change. The final aspect of Piderit's conceptualisation focuses on individual behaviour in an attempt to define employee resistance to change. She cites Brower and Abolafia (1995) who define resistance as a particular kind of action or inaction.

Zander (1950) (in Bolognese, 2002) conceptualised six primary reasons for resistance to change: (1) If the nature of the change is not made clear to the people who are going to be influenced by the change. (2) If the change is open to a wide variety of interpretations. (3) If those influenced feel strong forces deterring them from changing. (4) If the people influenced by the change have pressure put on them to make it instead of having a voice in the nature or the direction of the change. (5) If the change is made on personal grounds. (6) If the change ignores the already established institutions in the group. The list of reasons why individuals might resistance organisational change has expanded immensely since Zander's initial reasons and any attempts to cover all of them would produce volumes of literature. However, there are several that are quite common and prevalent, which help provide a solid basis to understanding the concept.

Majority of the theory on resistance to change centre on the following common reasons for resisting change:

➢ Fear (an emotion experienced in anticipation of some specific loss or danger) – a desire not to lose something of value, such as a loss of security, money, pride and satisfaction, friends, freedom, responsibility, authority, good working conditions, and status (Kirkpatrick, 1985). In many cases there is not a disagreement with the benefits of the new process, but rather a fear of the unknown future and about individuals ability to adapt to it. Low tolerance for change is defined as the fear that one will not be able to develop new skills and behaviours that are required in a new work setting. Hence, the fewer the changes required the greater staff self-efficacy (Bandura, 1997). Most researchers (Carson, 1998; Wadell and Sohal, 1998; Fullan and Stiegelbauer, 1991) identify fear as the primary obstacle to embracing change.

➢ Misunderstanding/Ambiguity - the change initiative and its implications are misunderstood (communication problems, inadequate information) (Kotter and Schlesinger, 1979). Lee and Steinberg (1980) (in Gustafson, 2003) found that successful change was positively correlated with clear objectives and explicitly identified, tangible and measurable tasks.

➢ Need for change - the belief that the change does not make sense for the organisation (Kotter and Schlesinger, 1979). Individuals may believe that the desired future state is misdirected and that the current state or other alternatives are better (Morris and Raben, 1995). Why do we need to change? It may create more problems than it is worth and our extra efforts are not being rewarded (Kirkpatrick, 1985). Leonard-Barton and Kraus (1985) (in Gustafson, 2003) found that change was more successful when the need for change was defined at a high level within the organisation.

➢ Uncertainty - change can create uncertainty, which leads to anxiety (Lorsch, 1976).

➤ Organisational principles - people may believe that "the change violates an important principle or commitment that the organisation must stand by" (Morris and Raben, 1995).

➤ Respect (an attitude of admiration or esteem) – individuals may lack respect for those who are initiating the change and are unable to view the change initiative objectively. (Kirkpatrick, 1985).

➤ Change approach - the change initiative is presented in a manner that people find objectionable, for example, they may have learned about it through gossip or rumour (Kirkpatrick, 1985).

➤ Participation - individuals are not allowed to participate in the change initiative and are not given an opportunity to provide any input (Kirkpatrick, 1985).

➤ Organisational culture/Disapproval - individuals sometimes look upon the change initiative as a criticism of how they may have done things in the past (Kirkpatrick, 1985).

➤ Timing - the change effort occurs at a bad time, other issues or problems are also being handled at time of the change (Kirkpatrick, 1985).


Findings from the 2003 "Best Practices in Change Management" benchmarking study conducted by Prosci Change Management Learning Center (Prosci's third study in the past six years that investigates best practices in change management), revealed that the top reasons for employee resistance are a lack of awareness about the change, comfort with the ways things are and fear of the unknown (Available online at http://www.prosci.com/change-management_bp1.htm). The study's participants included team leaders, change management advisory team members, project team members, consultants and management sponsors from 288 organisations. The top-five reasons cited in the study for employee resistance were:

1. *Lack of understanding around the vision and need for change*: Participants indicated that the primary reason for employee resistance was that employees did not understand the vision of this particular change project. Employees did not

clearly understand why the change was happening, nor did they have adequate knowledge regarding the change itself. Employees did not have the answer to the question, "What's in it for me?"; "How will it impact my daily work?"; "How will I benefit from the change?".

2. *Comfort with the status quo*: Participants indicated that employees tended to be complacent, or that the current way of doing business had been in place for a long time. The current processes and systems seemed fine to the employees, and they were opposed to the change since it forced them out of their comfort zone.

3. *Corporate history and culture*: The organisations past performance with change projects impacted the employees' support of the current change project. Employees were desensitised to change initiatives, as many had been introduced and failed. Employees expected it go away like those in the past.

4. *Opposition to the new technologies, requirements and processes introduced by the change*: Many participants felt that some employees resisted the change because of opposition to the actual change itself. The change was seen as adding unwanted work, responsibility and accountability. Lastly, some employees opposed the new processes; systems or technologies because they felt the change would not solve the problems.

5. *Fear of job loss*: Employees perceived the business change as a threat to their own job security. Some employees felt that the change would eliminate the need for their job, while others were unsure of their own abilities and skills in the new environment.

The shift in norms, values, beliefs and behaviours brought about by change modifies individuals' attitudes towards the change. On the positive side, change may be seen as an opportunity, innovation and growth. On the other hand, change can also be seen as akin to instability, upheaval, unpredictability, threat, and disorientation. Whether employees perceive change with fear and anxiety, or with excitement and confidence, depends partially on the individual's psychological makeup, partially on management's actions,

and partially on the specific nature of the change. To combat this resistance and promote the change initiative's success, management needs to understand which factors employees consider as inhibitors or enhancers and then develop strategies to address them. This is precisely the aim of this study.

Kotter and Schlesinger (1979) and Robbins and Decenzo (2001) suggest the following six change approaches to deal with resistance to change:

1. *Education and Communication*: One of the best ways to overcome resistance to change is to educate people about the change effort beforehand. Up-front communication and education helps employees see the logic in the change effort. This reduces unfounded rumours concerning the effects of change in the organisation. This strategy is useful where there is a lack of information or inaccurate information and analysis.

2. *Participation and Involvement*: Employees that are involved in the change effort are more likely to buy into change rather than resist it. This approach is likely to lower resistance. This strategy is appropriate where the initiators do not have all the information they need to design the change and where others have considerable power to resist.

3. *Facilitation and Support*: Managers can avert potential resistance by being supportive of employees during difficult times. Managerial support helps employees deal with fear and anxiety during a transition period. The basis of resistance to change is likely to be the perception that it causes some form of detrimental effect in the organisation. This approach is concerned with provision of special training, counselling and time off work. This strategy is used where people are resisting change due to adjustment problems.

4. *Negotiation and Agreement*: Managers can minimise resistance by offering incentives to employees not to resist change. This can be done by allowing change resistors to veto elements of change that are threatening, or change resistors can be offered incentives to leave the company through early buyouts or retirements

in order to avoid having to experience the change effort. This approach will be appropriate where those resisting change are in a position of power.

5. *Manipulation and Co-option*: Where other tactics will not work or are too expensive. Kotter and Schlesinger suggest that an effective manipulation technique is to co-opt with resisters. Co-option involves the patronising gesture in bringing a person into a change management planning group for the sake of appearances rather than their substantive contribution. This often involves selecting leaders of the resisters to participate in the change effort. These leaders can be given a symbolic role in decision making without threatening the change effort. The risk in this tactic is that if these leaders feel they are being tricked they are likely to push resistance even further than if they were never included in the change effort.

6. *Explicit and Implicit Coercion*: This strategy applies in cases where speed is essential and is to be used only as a last resort. Managers can explicitly or implicitly force employees into accepting change by making clear that resisting to change can lead to losing jobs, transferring or not promoting employees.

### 2.3.2 Perceptions: Why individuals' responses to change differ?

The term perception as used in cognitive psychology applies to the mental processes through which a person takes in, deals with and assesses information from the environment (physical and communicative) via the senses (Renn, 2004). The two basic requirements for perception are a sensory signal and an interpretation of that signal. Without interpretation, perception cannot occur. Human sensors are eyes, ears, and skin whilst interpreters are neural cell masses such as the brain. The author further dissects perception into the term "intuitive risk perception," which is based on how information on the source of a risk is communicated, the psychological mechanisms for processing uncertainty, and earlier experience of threats. This mental process results in perceived risk: a collection of notions that people form on risk sources relative to the information available to them and their basic common sense.

MacDonald (1998) explains the issue of resistance to change in relation to perception stating that reality is determined by perspective. Malato (2001) cites Douglas (1983) as writing that "we live in individually unique worlds" owing to irreconcilable differences of perspective that cause us to perceive reality differently. The essential fear of isolation causes people to want to be accepted by others. Similar beliefs and values bring people together. Acceptance of a reality is influenced by the human desire to reduce the feeling of isolation. The challenge on one's perspective may then be perceived as a challenge to one's reality, which may result in a protective response by owners of the perspective. This protective stance becomes resistance to change.

In addition, MacDonald (1998) suggests that experience influences perspective and that the two go hand-in-hand i.e. with more experience one is less inclined to change a point of view. This implies that managers experience change from a different perspective than that of employees. However, MacDonald (1998) states that the pressure for change is persistent owing to outside influences, especially competition.

Bridges (1991) believes that it isn't the actual change that individuals resist, but rather the transition that must be made to accommodate the change. He classifies change as situational: the new site, the new boss, the new team roles, the new policy and transition as the psychological process people go through to come to terms with the new situation i.e. change is external and transition is internal. This theory implies that change usually involves the individual's psyche (attitudes, beliefs and values), thus there are no clear solutions to the problem. As a result, researchers and scholars can only theorise on how to lessen or remove employee resistance to change, but in the final analysis the only way to do so effectively is to understand the unique circumstances within each individual that is causing their particular resistance. This section thus communicates the importance of understanding individuals' perceptions to change to aid successful implementation of the HRIS.

### 2.3.2.1    Ladder of Inference Model

Given that this study attempts to identify the various factors that employees perceive as obstacles to the HRIS, it is necessary to understand that individuals may have very different responses. The Ladder of Inference Model can be used to explain why individuals have different responses to the same input.

I take actions based on my beliefs

⇑

I adopt beliefs about the world (our beliefs affect what data we select next time)

⇑

I draw conclusion(s)

⇑

I make assumptions based on the meanings I added

⇑

I add meanings (cultural and personal)

⇑

I select "data" from what I observe (our beliefs affect what data we select)

⇑

I observe "data" from experiences (much as a videotape might capture data)
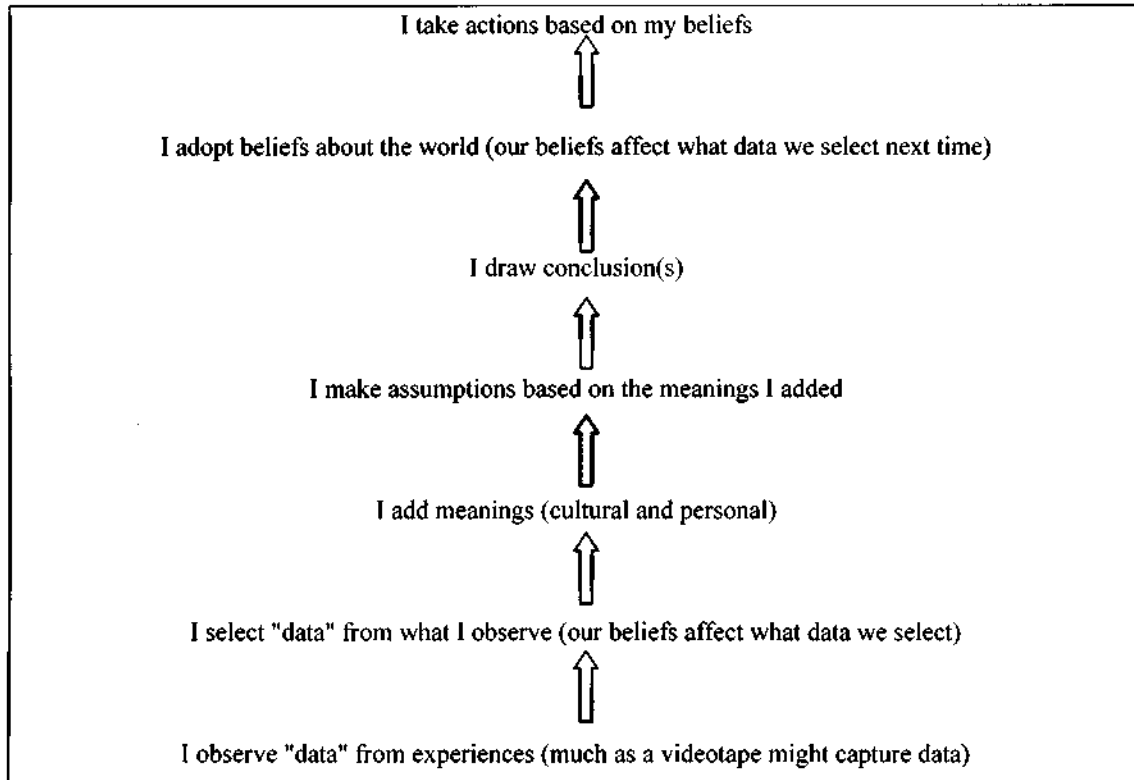
Figure 2.1: The Ladder of Inference Model        Source: Senge (1990)

Figure 2.1 suggests that individuals begin with Real Data and Experience (e.g. like that captured by a camera). Next they choose a set of Selected Data and Experience from what they observe (beliefs affect what data people select). To this Selected Data and Experience they add Meanings (cultural and personal), develop Assumptions based on the meanings they added, draw Conclusions, and finally develop Beliefs (beliefs affect what data people select next time). Beliefs then form the basis of individuals Actions, which again create additional Real Data and Experience.

The Ladder of Inference Model from Action Science is a representation of different ways that individuals make sense of and deal with everyday events. Individuals select and process certain aspects of events, and introduce elements from this processing into their thinking, feeling and interactions. It must be noted that this model therefore has valuable implications to researchers of qualitative studies in the manner in which they elicit information and analyse their data.

## 2.4 Technology Adoption/Diffusion Theory

Research trying to identify factors affecting technology adoption is usually perceived from one of three major perspectives (Park, 2003). The first is concerned with the characteristics of the individual. This approach supports that the decision to adopt or resist a technology is ultimately made by each person involved with the innovation. The second perspective focuses on the characteristics of the technology itself. The third perspective focuses on the characteristics of the environment in which the technology is to be introduced, which highlights the importance of external factors. This section discusses factors from technology adoption theory that employees may perceive as important to the HRIS technology change.

### 2.4.1 Diffusion of Innovation Model

Rogers' diffusion model provides the means to assess the likely rate of diffusion of technology as well as to identify the factors that may facilitate or retard technology adoption and use. The diffusion model proposed a linear relationship between the factors and the adoption and use of technology. Rogers (1995) postulated that in the adoption of a technology individuals' pass through five phases:

1. Knowledge: when the individual learns about the technology and how it works.

2. Persuasion: when the individual develops a positive or negative attitude of the technology.

3. Decision: when the person engages in activities to adopt or reject the technology.

4. Implementation: when the person uses the technology.

5. Confirmation: when the individual reinforces the original decision or reverses their previous decision to adopt or reject the technology.

Rogers emphasised that an individual's attitudes or beliefs toward a technology plays a key role in first the knowledge phase and then the decision phase of the adoption process. This study is concerned with the first three stages of diffusion theory, owing to the fact that the HRIS technology is conceptual at this point in time. Rogers' theory of adopter categories is central to many theories of diffusion. According to this theory, individuals may be divided into one of five categories according to the stage at which they adopt an innovation or technology. The number of new adopters of a technology tend to display a normal distribution or bell curve, as illustrated in Figure 2.2.



| INNOVATORS | EARLY | EARLY | LATE | LAGGARDS |
| 2.5% | ADOPTERS | MAJORITY | MAJORITY | 16% |
|  | 13.5% | 34% | 34% |  |
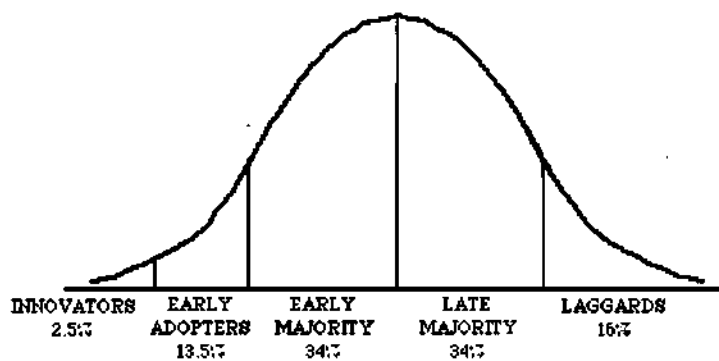
Figure 2.2: Categories of Technology Adoption Bell-Curve

Source: Rogers (1995)

Rogers (1995) describes the five categories of adoption as:

1. Innovators: are venturesome, seek out new ideas. Innovators accounted for the first 2.5% of the adopter population.

2. Early adopters: account for 13.5% of the population. They serve as opinion leaders and introduce potential adopters to the technology.

3. Early majority: accept the technology sooner than the average adopter because they deliberate longer about the appropriateness of adopting the technology. They account for 34% of the population.

4. Late majority: account for 34% of the population and tend to be sceptical about the technology because of uncertainty.

5. Laggards: account for 16% of the population and are traditionalists who use the past as a point of reference. They are very suspicious of the technology and change agents.

Rogers (1995) defined five technology characteristics namely: Relative advantage, Complexity, Compatibility, Trialability and Observability that form the basis for the rate at which individuals adopt a technology. Relative advantage, Compatibility, Trialability and Observability are positively related to adoption of a technology whilst, Complexity is negatively related. The characteristics and corresponding descriptions are illustrated in Table 2.1.

| Characteristic | Description |
|---|---|
| Relative Advantage | The degree to which a technology is perceived as better than the idea it supersedes. The focus is not on the objective advantages, but on the advantages as perceived by the individual. |
| Complexity | Refers to the degree of perceived difficulty in understanding or using a technology. |
| Compatibility | The degree to which an innovation is perceived as being consistent with existing values, past experiences and needs of potential adopters. Thus, a more compatible a technology the less uncertain it is because it fits with the person's life situation. |
| Trialability | The degree with which an innovation can be experimented. The more an innovation can be experimented with before full adoption must occur, the more likely the innovation will ultimately be adopted. |
| Observability | The degree to which the results of the technology or its benefits are visible. The easier it is for an individual to see the results of an innovation, the more likely the individual is to adopt it. |

Table 2.1: Description of Technology Characteristics        Source: Rogers (1995)

According to Rogers' theory, potential adopters of an innovation have to learn about an innovation and be persuaded to try it before making a decision to adopt or reject the innovation. Following adoption and implementation, the adopters decide to either continue using the innovation or stop using it. This theory of technology attributes is important because it highlights the importance that perceptions of potential adopters play in the adoption process. Rogers (1995) discovered that perceived attributes of an innovation explained 49% to 87% of the variance in the rate of adoption of innovations.

Tornatzky and Klein (1982) (in Grunwald, 2002) in their meta-analysis reviewed seventy-five articles concerning innovation characteristics and their relationship to innovation adoption. Their findings identified compatibility and relative advantage as the two characteristics most positively related to adoption. The only other consistent finding in their analysis was that complexity was negatively related to adoption. Cooper and Zmud (1990) in a study of weather forecaster's perceptions of an innovative computer-based training system, found relative advantage, complexity and compatibility to be significant adoption factors. Demonstrable benefits and valued consequences had a positive impact on implementation success in a study that examined employee opinions regarding reasons for change (Rousseau and Tijoriwala, 1999).

Kearn's (1992) (as cited in Park, 2003) in his diffusion study of eight computer-based systems examined twenty-five characteristics, which included the five identified by Rogers. His findings indicated that all twenty-five characteristics accounted for only one additional percent of variance in rate of adoption over Rogers' five. In later studies Surry and Gustafson (1994) (in Park, 2003) communicated that relative advantage, complexity and comparability were the most mentioned characteristics by adopters of a proposed innovation. Vinson (1996) (in Park, 2003) concluded that relative advantage explains a greater amount of the variance than any of the other five characteristics in the adoption of an innovation.

In summary, Rogers' innovation diffusion work includes three distinct yet related theories. The first is the 'innovation decision process' comprising five stages: knowledge, persuasion, decision, implementation and confirmation. The second, 'individual innovativeness', includes the adopter categories: innovators, early adopters, early majority, late majority and laggards. The third, 'rate of adoption', posits that the potential adopters' perceptions about an innovation's relative advantage, complexity, compatibility, trialability and observability affect whether or not they decide to adopt the innovation (Grunwald, 2002). This study is concerned mainly with Rogers' rate of adoption theory.

### 2.4.2 Technology Diffusion Models

A few models have been developed and empirically studied to identify the interaction of technology adoption variables, as opposed to studies that focus on single factors or a list of factors. The two dominant models comprise the Theory of Reasoned Action (TRA) and the Technology Acceptance Model (TAM).

### 2.4.2.1 Theory of Reasoned Action

A substantial body of research has established that attitudes may be used to predict technology use (Davis et al., 1989; Venkatesh, 1999; Venkatesh et al., 2003). Most research studies investigating the relationship between attitudes and behaviour centre on the Theory of Reasoned Action (TRA). The Theory of Reasoned Action states that an individual's behaviour is determined by their attitude towards the outcome of that behaviour and by the opinions of the person's social environment (Ajzen and Fishbein, 1980). The authors proposed that a person's behaviour is determined by his intention to perform the behaviour and that this intention is in turn a function of his attitude toward the behaviour and his subjective norm, as illustrated in Figure 2.3.
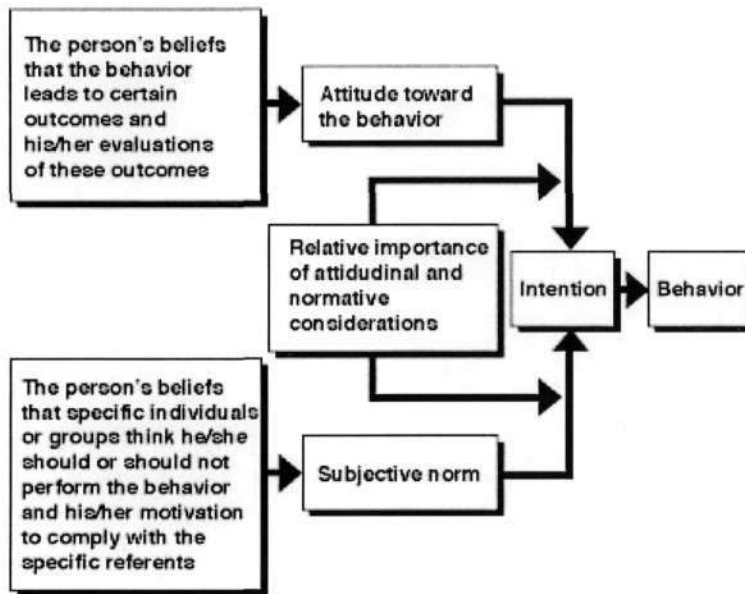
Figure 2.3: Theory of Reasoned Action Model        Source: Ajzen and Fishbein (1980)

The concepts utilised in the TRA Model are defined as:

➢ **Attitudes** comprise of beliefs that a person accumulates over his lifetime. These beliefs are formed from direct experience, outside information and others are inferred or self generated. However, only a few of these beliefs actually work to influence attitude. These beliefs are called salient beliefs and are said to be the "immediate determinants of a person's attitude" (Ajzen and Fishbein, 1980). Therefore, an attitude may be defined as a person's salient belief about whether the outcome of his action will be positive or negative. For example, if the person has positive salient beliefs about the outcome of his behaviour then he is said to have a positive attitude about the behaviour and vice-versa. Rating the beliefs for the probability that engaging in the behaviour will produce the believed outcome is termed the belief strength. Next the perception of whether this outcome is positive or negative may be evaluated using a Likert, or similar, scale. Combining these two factors gives a measure of attitude.

➢ **Subjective Norms** are beliefs about what others will think about the behaviour. In general, they are perceptions about how family and friends will perceive the

outcome of the behaviour (normative belief) and the degree to which this influences whether the behaviour is carried out (motivation to comply). These two factors are combine to give the subjective norm. It is important to note that subjective norms are formed only in relation to the opinions of persons considered to be significant or important.

> **Intentions** are the probability, as rated by the subject, that he will perform the behaviour. This intention is made up of the attitudes and subjective norms previously discussed. Fishbein proposed that variables such as demographics and personality traits, which are omitted in the model, might affect intention and consequently behaviour. However, these variables must significantly affect the attitude or normative belief component and their weights.

> **Behaviour** then may be defined as the transmission of intention into action.

A limitation of the theory stems from the nature of the self-reporting used to determine a subject's attitudes i.e. Self-reported data is very subjective and is not always accurate.

## 2.4.2.2 Technology Acceptance Model

Weick (1990) in his study "Technology as Equivoque" concluded that the manner in which an individual perceives the introduction of technology is critical to whether the person will adopt the technology. Building on the theory of the TRA, is the Technology Acceptance Model (TAM).

**The Technology Acceptance Model**
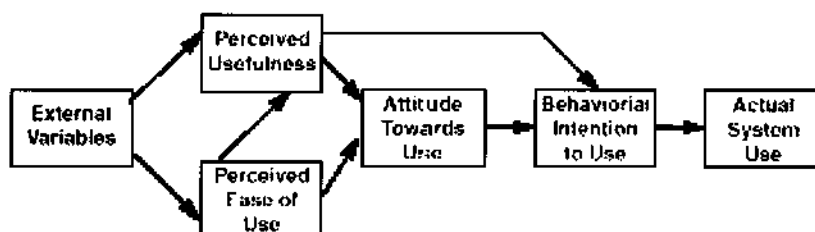
Figure 2.4: Technology Acceptance Model       Source: Davis et al. (1989)

The TAM, depicted in Figure 2.4, is an information systems theory formulated by Fred Davis (1989), which models how users come to accept and use a technology. Davis adapted the Theory of Reasoned Action by developing two salient beliefs that specifically account for technology usage, namely:

> ➤ **Perceived usefulness** - Defined as the degree to which a person believes that using a particular system would enhance his or her job performance.

> ➤ **Perceived ease-of-use** - Defined as the degree to which a person believes that using a particular system would be free from effort (Bagozzi et al., 1992).

The technology acceptance model is one of the most influential extensions of Ajzen and Fishbein's Theory of Reasoned (TRA). TRA and TAM, both of which have strong behavioural elements, assume that when someone forms an intention to act, that they will be free to act without limitation. In the real world there will be many constraints, such as limited ability, time constraints, environmental or organisational limits, or unconscious habits which will limit the freedom to act (Bagozzi et al., 1992). However, the TAM theorises that all other external variables, such as system-specific characteristics, are mediated by the two key beliefs Perceived Ease-of-use and Perceived Usefulness.

Several researchers (Adams et al., 1992; Hendrickson et al., 1993; Segars and Grover, 1993) have verified Davis' original study with empirical evidence on the relationships that exist between attitudes and system use (retrieved from http://en.wikipedia.org/wiki/Technology_acceptance_model). Davis' instrument is based on a number of disciplines (e.g., self-efficacy theory, a cost-benefit paradigm, adoption of innovation theories, the channel disposition model, and the human-computer interaction literature). In 1992, Davis proposed a new model where the new factor intrinsic motivation was introduced to enhance the original TAM. The intrinsic motivation factor incorporates technology liking and fun of system use. Venkatesh (1999) investigated the intrinsic motivations implicitly incorporated in the original version of TAM. His findings

lend support to the hypothesis that perceived enjoyment is also positively associated with ease-of-use.

Critiques of TAM and related theories have suggested that the model has strong limitations. Legris et al. (2003) reviewed 22 articles published from 1980 to 2001 that used TAM and arrived at the conclusion that TAM was a useful model, but one that "has to be integrated into a broader model, which would include variables related to both human and social change processes." Issues related to organisational culture are also absent in its theory. Although TAM2 was created to account for the influence of subjective norm in technology adoption and use, organisational factors were still absent in its model (Venkatesh et al., 2003).

### 2.4.3 Why attitudes are incomplete predictors of behaviour

It is vital to note that attitudes are not always direct predictors of behaviour. Theorists suggest predictors of behaviour, such as the intention to use or explore technology, may be limited by environmental impediments (Davis et al., 1989). Key impediments include perceptions of resource scarcity, lack of abilities, or other contingencies such as limits on decision-making or control over physical events. Regardless of whether actual impediments exist, when individuals perceive impediments, intentions may not effectively predict behaviour (Bagozzi et al., 1992). Thus, understanding the individual's perceived factors of resistance are crucial to addressing them.

### 2.4.4 Technology Resistance Model

Research theory on inhibitors to technology change may be summarised into Ram's (1987) model of technology resistance (illustrated in Figure 2.5), which is grouped into the components: Perceived Technology Characteristics, Individual Characteristics and Propagation Mechanism operating under the influence of External Factors (organisational, social and situational). The role of these factors varies with the innovation's life cycle. If an individual perceives the degree of change in adopting the technology or innovation as high, he resists it. Many authors (Ram, 1987; Rogers, 1995) emphasise that technology adoption is not the obverse of technology resistance and that

adoption only begins once resistance is overcome. Identifying the factors that cause resistance and overcoming them thus enhance technology adoption.
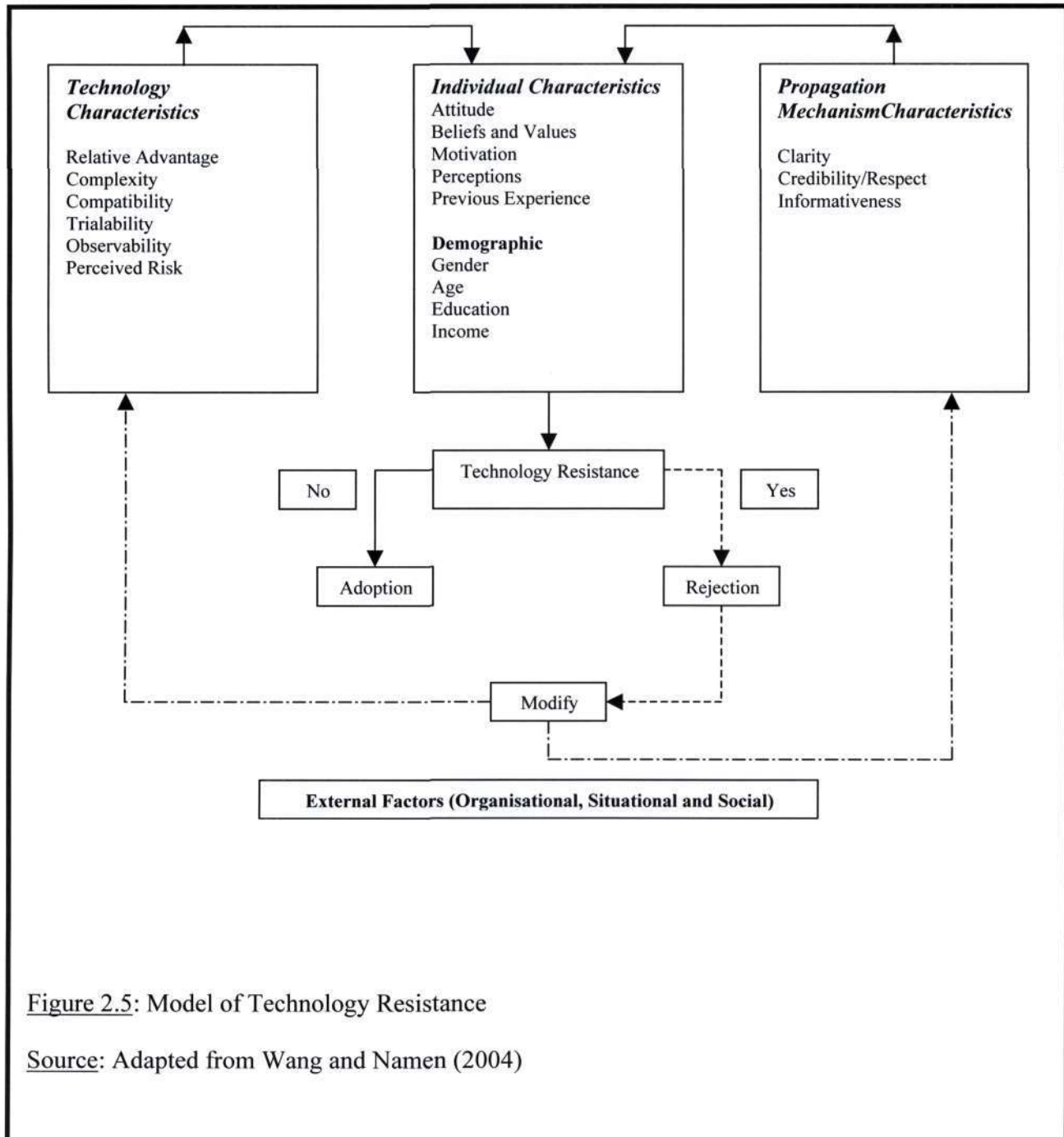


Figure 2.5: Model of Technology Resistance

Source: Adapted from Wang and Namen (2004)

Ram (1987), in addition to Rogers (1995) technology characteristics, incorporated perceived risk as a factor of resistance to technology adoption. Perceived risk – represents an individual's fears about loss among financial, performance, social, psychological security and convenience that the technology may cause and is therefore a multidimensional construct. In his study on "Change management strategies for successful ERP implementation" Aladwani (1998) cites Sheth's (1981) framework for user resistance to a new technology, which shows that there are two fundamental sources of resistance to innovations like ERP: perceived risk and habit. Perceived risk refers to one's perception of the risk associated with the decision to adopt the innovation, i.e. the decision to accept an ERP system. Habit refers to current practices that one is routinely doing.

To understand the importance of considering both the personal and the social environment as determinants of behaviour, Surry and Farquhar (1997) (in Park, 2003) described adopter-based theories as opposite to developer-based theories. Developer-based theories assume that the best way to bring about change is to create a system or product that is significantly superior to existing products or systems. However, in reality technological superiority alone is not enough to guarantee the adoption of an innovation. On the contrary, adopter-based theories view the individual who will ultimately implement the innovation in a practical setting, as the primary force for change. The QWERTY and Dvorak keyboard example is often cited for adopter-based theories (Rogers, 1995): the Dvorak keyboard configuration was shown in early studies to be more efficient. However, since most typists learned to type using the QWERTY configuration and are comfortable with it, they resist the Dvorak configuration despite its greater efficiency. This is a classic example of how human, interpersonal, and social factors often play a more significant role in adoption than technological superiority.

### 2.4.4.1  Propagation Mechanism Characteristics

Lee and Steinberg (1980) (in Gustafson et al., 2003) found that successful implementation was positively correlated with the communication of clear objectives and explicitly identified, tangible, and measurable tasks. Owing to the lack of respect for

change agents, individuals' view the change initiative subjectively and not objectively (Kirkpatrick, 1985). In addition, employees are more likely to support a project that they believe is in their own best interests. These themes of clear informative communication and their importance are represented in virtually all change management literature.

## 2.4.4.2   External Factors

External barriers to technology adoption comprise organisational, situational and social factors. Situational barriers are those that arise from one's situation in life at a given time and might include such things as bad timing. Employees may be unwillingly to invest the time to acquire new skills. Organisational barriers may comprise financial, communication, cultural, organisational support and leadership, time availability and physical environment. Organisational culture reflects how things are experienced in a given organisational environment.  As cited in Malato (2001), Cameron and Quinn (1998), Cox (1991), Gordon (1991), and Schein (1993), describe organisational culture as having its own language, shared meanings, symbols, definitions of success and failure.

Ely (1999) proposed eight environmental conditions that play an important role in facilitating implementation of innovations: dissatisfaction with the status quo, existence of knowledge and skills, availability of resources, availability of time, existence of rewards, expectation and encouragement of participation, commitment by stakeholders involved, and leadership. Ravitz (1999) findings placed availability of resources, availability of time, existence of rewards, commitment and leadership as the most important determinants related to the implementation of innovation. From the review of related studies Park (2003) identified subjective norm, supports and time as key external variables.

### Subjective Norm

Subjective Norm is defined as "the person's perception that people who are important to him/her think they should or should not perform the behaviour in question" (Ajzen and Fishbein, 1975). Several studies (Jorde-Bloom and Ford, 1988; Cook, 1995) (in Park, 2003) conclude that subjective norm is one of the significant predictors, which influences

the adoption of an innovation. An important study conducted by Marcinkiewicz and Regstad (1996) suggested that subjective norm is an important predictor of computer use.

According to the Social Information Processing Model (SIPM), developed by Salancik and Pfeffer (1978), individuals' perceptions of technologies are also influenced by the opinions, information, and behaviours of people they communicate with. Although the TAM is a valuable model for understanding technology usage it suffers from one drawback specifically, it does not account for the influence of subjective norm in the adoption or use of technology (Malhotra and Galletta, 1999). In order to address this issue, the authors introduced Kelman's (1961) concept of Social Influence, which is understood in terms of the processes of internalisation, identification and compliance, to determine the influence of subjective norm on predicting use. The authors provide evidence of the reliability and validity of the proposed constructs, factor structures and measures via analyses of field study data.

Kelman distinguished between three different processes of social influence that affect individual behaviour:

1. *Compliance*: when an individual adopts the induced behaviour not because they believe in its content, but with the expectation of gaining rewards or avoiding punishments.

2. *Identification*: when an individual accepts influence because they want to establish or maintain a satisfying self-defining relationship to another person or group.

3. *Internalisation*: when an individual accepts influence because it is congruent with their value system.

By distinguishing between these processes, one could ascertain if usage behaviour is caused by the influence of referents or by one's own attitude. Users who perceive use of the technology to correspond with their values are likely to be internalised i.e. committed and enthusiastic in their use. On the contrary, individuals who perceive use merely as a

means to obtain rewards and avoid punishments are likely to be compliant i.e. unvested in their use.

Testing their new theory on a large US health organisation, utilising groupware technology (i.e. collaboration and communication technology), Malhotra and Galletta (1999) discovered that:

➢ Compliance has a negative influence on attitude, whilst Internalisation and Identification have a much stronger positive influence on attitude.

➢ The positive influence of perceived usefulness and perceived ease-of-use on attitude as suggested by original TAM are confirmed.

➢ Social influences do not seem to have any direct relationship with behavioural intent. However, the positive influence of perceived usefulness and attitude suggested by TRA is confirmed by their findings.

➢ The positive relationship between behavioural intention and technology use as suggested by TRA is verified by their findings.

➢ The key emphasis of innovation adoption and diffusion initiatives should be on developing user attitudes that are conducive to effective utilisation and acceptance behaviours.

The conclusion of importance from the Malhotra and Galletta study is social influence does not significantly predict behavioural intent directly. The current study will ascertain whether HR employees tend to display Internalisation, Identification or Compliance social processes with respect to the HRIS. The results of this instrument allow the researcher to triangulate with results of the interviews, thus strengthening study reliability for the social influence construct.

"Why do users of new technology often exhibit ineffective acceptance and usage behaviour thus resulting in marginal performance improvements resulting from technology implementation?" The authors offer two possible answers. First, decisions

about adoption of new information technologies are often made by top executives and often do not involve the end users in the process. Being omitted from the decision-making process means that users are not personally invested in the use of the new systems. Second, the users may also lack an in-depth understanding of the capabilities of the new systems thus resulting in less than optimal use of the systems. In such scenarios, users often act in compliance with the top managers' instructions, and their attitude is not derived from identification or internalisation with the use of the new technologies.

## Support

Employees may resist technology adoption if the necessary technical support is perceived as a burden. Groves and Zemel (2000) discovered that technology support, such as training, information and administrative support, were rated as very important factors influencing use of technologies in teaching. Organisational support (Anandarajan et al. (2002) in Brown, 2002) has been shown to predict technology use. Leadership commitment, involvement, and accountability are key features for successful implementation. Lewis (1997) (in Malato, 2001) suggests that a shared vision elevates employee aspirations giving their role in the organisation greater meaning. There is an increased sense of commitment, motivation and energy that is directed at a common purpose. Surry and Farquhar (1994) proposed that organisational factors affect the adoption and utilisation of technology. Organisational factors may be divided into two categories namely: physical environment and support environment. They asserted that inappropriate environmental support could often be an important hindrance to successful innovation adoption.

## Time

Stress and autonomy may influence technology adoption. Change can only be effective and productive if there is sufficient time for employees to implement it. In a survey study about factors influencing the use of technology and perceived barriers to use of technology, Groves and Zemel (2000) found that faculty members perceived time needed to learn as an important factor in influencing use of technology. In addition, several other studies discovered the importance of time in the adoption of technology (Anderson,

Varnhagen, and Campbell, 1998; Daugherty and Funke, 1998; Dooley, 1998; Ndahi, 1999; and Rogers, 2000) (as cited in Park, 2003).

Ram's model of resistance incorporates technology attributes, individual characteristics, communication characteristics, organisational characteristics and situational factors, thus providing a fairly comprehensive model of resistance to technology adoption. This model sees the potential adopter as complex, aggregating rational aspect (models based on characteristics of the technology), psychological (models based on individual characteristics including attitudes, perceptions, beliefs) and other related aspects (models based on organisational, situational and social factors).

## 2.5 Other Key Variables

To completely understand the rationale behind the attitude measure used in the quantitative part of this study, the following section discusses important individual characteristics.

### 2.5.1 Self-Efficacy and Anxiety

The digital divide has been conceptualised primarily in terms of patterns of race and class discrimination that are reflected in unequal access to computers. While the importance of class and ethnicity cannot be denied, all novice technology users face psychological as well as socio-economic and racial barriers. Complexity, knowledge barriers to initial computer adoption, and comfort and satisfaction issues faced by new users may be construed as self-efficacy deficits (Eastin and LaRose, 2000). Self-efficacy, which is a component of attitude, is defined as the "belief in one's capabilities to organise and execute the courses of action required to produce given attainments" (Bandura, 1997). People who have little confidence in their ability to use technology, who are dissatisfied with their technology skills or who are uncomfortable using technology may be said to have weak self-efficacy beliefs. Those with low self-efficacy should be less likely to perform related behaviours in the future, in this instance, adopt and use the HRIS technology, than those with higher self-efficacy do.

Within social cognitive theory (Bandura, 1997) self-efficacy is not a measure of skill, but what individuals believe they can do with the skills they possess. The relationship between self-efficacy and computer use appears obvious. Computers represent a complex technology, requiring considerable skill and extensive training to operate successfully. Self-efficacy is essential to overcome the fear many novice users experience. Compeau and Higgins (1995) (in Eastin and LaRose, 2000) empirically verified the relationship between computer self-efficacy and computer use. Venkatesh et al. (2003) tested the effect of self-efficacy on perceived ease-of-use and found that the perceptions about a new system's ease of use are determined by the individual's general computer self-efficacy. Staples et al. (1998) found that those with high levels of self-efficacy in remote computing situations were more productive and satisfied, and better able to cope when working remotely. Thus these studies illustrate the significance of attitude and perception in predicting computer technology use. In the current study self-efficacy forms one of the four subscales of the attitude measurement instrument.

Brosnan (1996) describes technophobia as a term used to describe the resistance to technology. Brosnan (1996) cites a 1996 study commissioned by Motorola amongst the British population that reported 49 percent of the general public did not use computers at all. Of the non-users, only 25 percent claimed lack of interest as the reason for non-usage. Brosnan interprets these findings as implying that psychological factors (which he defines as anxiety or negative attitudes) play a role in resistance to computer use. Anxiety is generally accepted as a deterrent to performance and learning (Brosnan, 1996).

Introducing technologies may be an impediment to learning, if the technology is perceived as being complex. Based on the TAM and the research findings of Brown (2002) that was conducted on students within a South African context perceived ease-of-use is a result of self-efficacy and anxiety. Perceived ease-of-use is defined, as the extent to which a person believes that using a technology will be free of effort (Davis, 1989). Several studies on Internet adoption have confirmed these relationships to still hold true (Lederer et al. (2000), Teo et al. (1999) in Brown, 2002). However, the nature of

relationships between these constructs differs across cultures. Reasons for this were explained in terms of Hofstede's four cultural dimensions. For cultures with high uncertainty avoidance, as is found in South Africa, perceived ease-of-use is a prominent influence on both usage and perceived usefulness (Brown, 2002). Brown (2002) also concluded that within the context of a developed and developing country such as South Africa, self-efficacy and computer anxiety have stronger influences than other predictors such as perceived usefulness on technology use, owing to a learning environment.

Howard (1986) (in Malato, 2001) identified three interrelated causes of anxiety namely: operational origins (which can be treated relatively easily), knowledge based origins and psychological origins (which are progressively more difficult to overcome). Howard (1986) suggests that training and experience will address much of the anxiety that exists. He does warn however that a brief session will not succeed in significantly reducing computer anxiety i.e. short-term, high intensity training programs are ineffective. Other studies supporting Howard's theory include Gressard and Loyd (1987) and Woodrow (1992), whose findings suggest that computer training significantly decreases anxiety about computers while confidence and computer liking are increased.

### 2.5.2  Computer Experience

The amount of direct computer experience has been found to be a major consistent correlate of computer attitudes, with increased experience leading to more positive attitudes. A study comparing early innovation adopters and the later majority established that usage rate might be linked to individual perception of the technology (Ram et al., 1994). Other studies, which identified a positive correlation between favourable computer attitudes and computer familiarity, include Koohang (1987) (in Whitrow, 1999) and Sacks et al. (1993). Busch (1995) demonstrated prior computer experience to be a strong predictor of computer attitude, in his study investigating computer attitudes of 147 college students and perceived self-efficacy in the use of computers.

Mackie and Wylie (1988) have outlined a model which demonstrates that user acceptance of technology is affected by:

1. The user's awareness of the technology and its purpose.

2. The extent to which the features of the technology are consistent with the user's needs.

3. The user's experience with the technology.

4. The availability of support when using the technology.

Czaja and Sharit (1998) examined whether attitudes toward computers are influenced by computer experience and if these attitudes vary as a function of age, gender and computer task characteristics, using the Attitudes Toward Computers Questionnaire. Findings from this study indicated that computer attitudes are modifiable regardless of age or gender. Feedback revealed that the most cognitive task was the least enjoyable, which has implications for structuring computer-training programs. This study demonstrated that providing users with an opportunity to interact with unfamiliar technology is an effective means of attitude change (i.e. Rogers construct of trialability). It must also be noted that experience can be either direct or indirect. Jay and Willis (1992) give the example of actual contact with a computer to describe the former, and observations of others using computers, mass media exposure and the like to describe the latter. Therefore, attitude change may occur whenever new information about computers is encountered, giving rise to the question whether overcoming technophobia among senior adults stems from increased use of technologies or from increased societal pressures.

Levine and Donitsa-Schmidt (1998) examined if a causal link existed between computer attitudes, experience and belief. Participants comprised 309 Israeli students in grades seven through twelve, who completed a self-report questionnaire. Findings show that computer use variables were significantly and positively related to computer attitudes. Positive correlations were also found between computer experience and computer confidence, with a significant relationship between computer attitudes and computer

confidence, as well as between both computer experience and confidence. Results supported the hypothesis of a causal model for computer experience, computer confidence, computer attitudes, and perceived computer knowledge.

In a rare longitudinal study of Computer Usage, Brosnan (1996) applied the Theory of Reasoned Action in conjunction with Davis' Technology Acceptance Model to form a comprehensive model of computer usage. The strength in Brosnan's study lay in the fact that it incorporated the factors of Ease-of-Use, Usefulness, Attitudes, Computer Anxiety, Computer Experience, Fun and Self-Efficacy. Complementing this major strength was the fact that it was a longitudinal study and not a cross-sectional one. The longitudinal study was conducted on 154 psychology students over a period of one year. Findings of the study indicate that behavioural intention to use computers was predicted by current usage and perceived usefulness. Current technology usage is predicted by ease-of-use, whilst other technology usage is predicted by computer anxiety. Computer anxiety is in turn predicted by self-efficacy and how much 'fun' a computer is thought to be.

### 2.5.3 Demographic Variables

Many articles tend to be anecdotal in nature or unsubstantiated, with little or no empirical evidence or statistical analysis. Those studies that are considered relevant in their research approach and which address issues pertinent to the current study have been considered. Specifically, this section examines the apparent trends in gender equity, age and education, and their influence in the current study. Owing to the fact that these variables (apart from education) are difficult to modify, this study does not emphasise them. However, in order to present a complete picture of this study's topic and compensate for the lack of emphasis an intensive review of these variables and their influence on computer technology resistance and use is presented.

### 2.5.3.1    Gender

Many authors site gender differences with respect to computer attitudes as an important issue in the realm of computer education. This is said to affect computer interest, enrolment for computer related courses, choice of career and the use of computers in the

workplace (Busch, 1995). However, previous research investigating significant differences between males and females attitudes towards computer technology present conflicting results. Potential reasons sited for this deviation in findings include:

> The studies may include a range of computer attitude components, such as acceptance, affect, cognition, comfort, confidence, courses, interest, liking, locus of control, motivation, programming, training, case scenarios, and stereotypes. Thus, results of gender-related computer attitude studies may differ depending on the components of the computer attitude scales used (Luchetta, 2000).

> Cultural differences and encouragement (role models) (Busch, 1995).

> Socio-economic status and geographical location of individuals (Whitrow, 1999).

> Age, experience and cohort group effects (Luchetta, 2000).

The effect of the infestation of computer technology and the prospect that individuals differ with regard to their interest in and reaction to technology has received great attention among educators and organisations. Kaplan (1994) in his paper "American Demographics" reported that women believe computers are fun and want to be able to use machines. Men on the other hand, are reportedly more interested in mastering computer commands and want computers with fancy functionality, such as voice recognition. Kantrowitz (1994) confirmed this believe when she indicated that men tended to be seduced by technology, while women appreciated the practical application of technology. Campbell and McCabe (1984) explained this difference in attitude toward computers based on gender as a result of socialisation i.e. society associates technical objects as a male domain.

Early literatures from the 1980s imply that more positive attitudes towards computers and technology existed among males. However, at present computers are prominent in majority of organisations and homes, at least at some significant level. Therefore based on Lee's (1970) principle conclusion that individuals are likely to be apprehensive when they initially encounter new technology, but as they familiarise themselves with the

technology and adopt it, they realise its inherent value, it is expected that the influence of gender in predicting individuals attitudes towards computers will lessen given technology's prominence in today's environment.

Ray et al., (1999) in their study "Men's and women's attitudes toward computer technology: A Comparison", concluded that there has indeed being a change in attitude between the genders today as compared to the early 1980s. The study concluded that:

➢ Modern day women have a slightly more positive perception above men that computer technology in the workplace will help improve productivity.

➢ Women also display more comfort with the changes that technology has created in the social and political scene.

South African studies by Clarke and Finnie (1997) (in Galpin et al., 2003) support the Ray et al. conclusion. Their study showed that there was no significant difference between genders, whereas the study conducted by Finnie twelve years earlier indicated very clear differences in that females had less positive views of computers and less technical appreciation of computers. In addition, the Third User Web Survey (Available at http://www.southafrica.co.za/survey) illustrates that the most notable trend from previous year studies is the increase in female users from 11% in 1997 to 30% in 1998.

However, Galpin et al. (2003) in their study "Gender and educational background and their effect on computer self-efficacy and perceptions" drew the conclusion that female students displayed lower self-efficacy (i.e. the belief that an individual has in their ability to perform a specific task) than their male counters parts. This difference became less prominent between the genders in the high school sample, thus indicating that age may have a significant role in influencing attitudes towards computer technology. Studies supporting the notion that individuals' attitudes towards computer technology are significantly different between males and females include Sacks et al. (1993), Kay (1992) and, Smith and Necessary (1996) (in Luchetta, 2000). In contrast, other research

concluded that no significance differences exist between males and females with regard to attitudes towards computers. Examples include Barrier and Margavio (1993), Ory et al. (1997) and Leite (2000).

A trend observed with respect to gender and attitude towards computer technology is that during earlier studies significant differences were found between the two variables. However, more recent research displays no significant differences between the variables. This migration of findings may be attributed to computer technology embedding itself in our daily lives as we proceed through the so-called Information Age.

### 2.5.3.2 Age

Organisations today require more and more knowledge workers to remain competitive in today's dynamic economy. Knowledge workers tend to be perceived as younger, recent graduates, rather than older more experienced workers. Owing to these stereotypes, employers may inadvertently categorise older workers as having less abilities and interest in learning new technology (Sharit et al., 1998). Effectively, these stereotypes convey that older workers are not capable of coping with the changes in the workplace. Although some older individuals harbour negative attitudes, the majority of the literature on the subject of 'technology and aging' indicates that some assumptions about older adults are untrue.

Behaviour is shaped by our attitudes and beliefs (Jay and Willis, 1992) that are gathered from life-experiences and interactions. Technological advancements such as the computer and even more recently the Internet influence our social, political, and economic relations collectively and individually i.e. a person's attitude towards technology can be directly attributed to his/her social framework and experience. With this in mind, our aging population has witnessed numerous technological advancements, which inevitably has influenced their lives.

Ocak (1998) in his qualitative study titled "Adult Learners' Attitudes toward the Computers: A Case Study" posed the question, Why is it important that adult learners use the computer more efficiently? The answer for this is that the current population of employed older adults has been forced to become familiar with new technology during their working years, whereas the younger generation became familiar with computers before or at the beginning of their working years. Benefits of computer technology to older adults, include: decreased work load, compensation for infirmities, increased safety for the older adult, especially those living alone, greater opportunity for working at home or working part time and creation of new opportunities for the older adult in the workplace. Findings from the study imply that older adults are not afraid of computers; instead, their lack of contact and knowledge of the potential of computers are coupled with a lack of confidence in their learning abilities, resulting in their avoidance of computers and related training. However, it must be noted that Ocak's participant's beliefs about the nature of computers are related to her experiences with computers.

With respect to the dimension of age, Smith (1986) discovered students that learned technology in well-structured classroom situations displayed insignificant differences between genders. However, when structures were absent, the difference between genders increased with age. Arch and Cummins (1989) supported Smith's conclusion when they conducted a similar study at college level. In her study examining whether experience or age was a better predictor of computer anxiety among workers, Lori Butchko (2001) confirmed conclusions of earlier research that experience and not age was a better predictor of computer anxiety.

Work on experience and computer anxiety by Czaja and Sharit (1998) found that older individuals display higher levels of discomfort, less control and lower levels of efficacy with respect to computer use. However, older persons displayed lower levels of stress than their younger counterparts. A major finding was that the level of computer anxiety showed a positive correlation with computer experience and not age. In addition, computer use was also related to attitudes toward computer technology.

The strength of Butchko's study is its timeliness in that given the pervasiveness of technology in today's world allows younger and older participants in her study to have similar levels of computer experience, which lends greater credibility in her findings. A multiple regression analysis revealed that computer experience alone predicted computer anxiety, with the age variable making no significant contribution. A crucial disadvantage of Butchko's study as compared to this study is that the employees in her study were temporary employees. Thus, it is fairly possible that the attitudes of temporary employees and permanent employees may differ seeing that temporary employees may feel freer to express themselves. Other limitations on Butchko's research include the lack of representativeness owing to the large percentage of female participants (82.1%) and of clerical employees (50.9%). In addition, the sample size was small, and the response rate (57 questionnaires returned) was not as high as expected.

Within a South African context, the Third User Web Survey (1999) (Available at http://www.southafrica.co.za/survey) dispels the stereotype that the Internet is the domain of the young finding more users over the age of 50 than under the age of 21. The average Internet user age was recorded at 33 years. More recently in a study conducted by software giant Microsoft®, computer use and attitude rates are highest for individuals aged 18-25 and lowest for individuals over the age of 60. It should be noted that these reported age differences may represent a cohort effect rather than a true age difference, since younger cohorts have increased contact with computer technology in their daily lives. Today's cohort of older individual's would report an increased positive attitude toward technology use owing to increased exposure in their daily lives (Salib, 2002) i.e. as exposure to technology increases the likelihood of positive attitudes also increases thus, lifelong learning has played an integral role in forming a computer-literate aging population.

### 2.5.3.3 Education

Studies regarding education have reported inconsistent results due to the fact that various economic groups have differential access to computer technology (Salib, 2002). Building on the dimension of education, Galpin et al. (2003) concluded that students from disadvantaged backgrounds, having "lower" education, were less positive about computers as a beneficial tool and were more fearful of computers. Supporting her conclusion was the NPR survey, which indicated that Americans with less education and over the age of 60 displayed more negative attitudes toward technology.

The study undertaken by Microsoft® indicated that working age adults with lower levels of education and household income were less likely to use computers at both the office and at home than those with higher levels of education and income. Internet usage studies discovered that seniors have become one of the fastest growing age groups using the Internet today. According to the 10th GVU WWW User Survey (1998), approximately half of the respondents reported household incomes of $50,000 (US) or more. Educational attainment of the average user is also important to consider since education is related to socio-economic status. Most Internet users are highly educated with 87.8% having at least some college education and 59.3% have obtained at least one degree. However, this study was limited to a US context and as such may not correspond with findings in SA.

Brosnan claims that there are contradictory findings regarding demographic variables. Siervert's study showed neither age, gender, nor education was related to computer anxiety (as cited in Brosnan, 1998). As such, this study focuses on factors that are modifiable and related to successful change implementation.

This chapter has presented the literature relevant to the research questions stated in chapter one. Based on the literature review of this chapter, the next chapter presents the research methodology and framework used to answer the research questions of this study.

# CHAPTER 3

## 3. METHODOLOGY

Chapter three describes the research methodology utilised to investigate the research questions of this study. The research questions were formulated based on the theory presented in the literature review. This chapter presents the research framework, and delineates the study sample, tools and procedures.

### 3.1 Frame of Reference

A common thread of previous technology acceptance models such as TAM is their focus on cognitions about the technology. TAM examines the precursor beliefs to predict a focal attitude toward the technology in question (Stam et al., 2003). Issues related to organisational culture and other possible underlying inhibitors or enhancers are not present in its theory. Given the literature review in Chapter 2, this study attempts to formulate a frame of reference for this study based on a combination of key variables from resistance to change theory and technology adoption theory. The resulting model (Figure 3.1) incorporates key variables from four major perspectives: personal characteristics, perceived technology characteristics, propagation mechanism characteristics and external factors.

The Frame of Reference illustrated in Figure 3.1, shows how the research questions converge. It attempts to illustrate how the important factors in technology resistance and adoption relate to each other. It is noted that perceived risk is a multidimensional construct (incorporating fear and uncertainty) and therefore may span all four categories. This model has only included the most common factors of inhibitors or enhancers and as such other inhibitors or enhancers may arise from the findings of this study in addition to those illustrated. Given that our intent was to identify inhibitors or enhancers that not only predicted chance of success, but were modifiable as well, this study did not focus on demographic variables (which from the literature review displayed contradictory findings).

**External factors**
**Organisational**
Need to change
Organisational principles
Organisational culture
Participation
Time availability
Technical Support
**Situational**
Timing

**Subjective Norm (Social Influence)**
Compliance
Identification
Internalisation

**Individual Characteristics**
Attitudes
Beliefs and Values
Self-efficacy
Anxiety
Perceptions
Liking/Enjoyment
Motivation
Prior Experience
**Demographic**
Gender
Age
Education

**Propagation Mechanism Characteristics**
Clarity (Misunderstanding)
Informative
Respect/Credibility for change agents

**Technology Characteristics**
Perceived risk (Fear and uncertainty)
Relative Advantage (Perceived usefulness)
Complexity (Perceived ease-of-use)
Compatibility
Trialability
Observability

**Adoption or Rejection**

Figure 3.1: Frame of Reference                     Source: Author's

## 3.2 Research Questions

The research problem is fairly extensive and it is therefore difficult to consider all the related factors. Drawing on the literature review, this study is interested in understanding the main inhibitors or enhancers to technology adoption by employees at both change levels. Thus the following important variables are identified:

| Category | Key Variable | Literature |
|---|---|---|
| *Individual/Personal characteristics* | Self-efficacy | Bandura (1997), Bridges (1991) |
| | Anxiety | Bridges (1991), Compeau and Higgins (1995) (in Eastin and LaRose, 2000) |
| | Computer experience | MacDonald (1998), Koohang (1987), Ram (1987) and Sacks et al. (1993) |
| | Demographic | Ajzen and Fishbein (1980), Ram (1987) |
| | | |
| *Perceived Technology characteristics* | Relative advantage (Perceived usefulness) | Rogers (1995), Rousseau and Tijoriwala (1999), Gustafson (1994) (in Park, 2003), Davis (1989) |
| | Complexity (Perceived ease-of-use) | Rogers (1995), Gustafson (1994) (in Park, 2003), Davis (1989) |
| | Trialability | Rogers (1995) |
| | Compatibility | Rogers (1995), Gustafson (1994) (in Park, 2003) |
| | Observability | Rogers (1995) |
| | Perceived risk (Fear) | Ram (1987), Carson (1998), Wadell & Sohal (1998), Fullan and Stiegelbauer (1991), Procsi (2003) |
| | | |
| *Propagation (Communication) characteristics* | Clarity/misunderstanding | Kirkpatrick (1985), Ram (1987), Kotter and Schlesinger (1979), Lee and Steinberg (1980), Robbins and Decenzo (2001) |
| | Respect/credibility of change agents | Kirkpatrick (1985), Ram (1987) |
| | | |
| *External factors* | Organisational culture | Kirkpatrick (1985), Procsi (2003) |
| | Employee participation (involvement) | Kirkpatrick (1985), Ely (1999), Robbins and Decenzo (2001) |
| | Need for change | Kirkpatrick (1985), Morris and Raben (1995), Procsi (2003) |
| | Organisational principles | Morris and Raben (1995), Robbins and Decenzo (2001) |
| | Time availability | Ram (1987), Ely (1999) |
| | Situational (Timing of the change) | Kirkpatrick (1985), Ram (1987) |
| | Subjective Norm (Social influence) | Ajzen and Fishbein (1975), Ram (1987), Marcinkiewicz and Regstad (1996), Malhotra and Galletta (1999) |

Table 3.1: Categories and Key Variables                    Source: Author's

To facilitate the answering of the research questions defined in Chapter 1, they were broken down into relationships between the main variables, as shown below (Note: these relationships apply to both levels of change i.e. general employees and HR employees):

**Objective 1 (Research Q1 and Q2)**

RQ1: There will be a negative relationship between self-efficacy and employee resistance to the HRIS technology.

RQ2: There will be a positive relationship between anxiety and employee resistance to the HRIS technology.

RQ3: There will be a positive relationship between perceived risk (fears and uncertainty) and employee resistance to the HRIS technology.

RQ4: There will be a negative relationship between relative advantage (perceived usefulness) and employee resistance to the HRIS technology.

RQ5: There will be a negative relationship between perceived enjoyment/liking and employee resistance to the HRIS technology.

RQ6: There will be a negative relationship between perceived ease-of-use (less complexity) and employee resistance to the HRIS technology.

RQ7: There will be a positive relationship between misunderstanding and employee resistance to the HRIS technology.

RQ8: There will be a negative relationship between need for change and employee resistance to the HRIS technology.

RQ9: There will be a negative relationship between organisational principles and employee resistance to the HRIS technology.

RQ10: There will be a negative relationship between respect for change agents and employee resistance to the HRIS technology.

RQ11: There will be a negative relationship between a well-communicated change approach and employee resistance to the HRIS technology.

RQ12: There will be a negative relationship between participation and employee resistance to the HRIS technology.

RQ13: There will be a positive relationship between disapproval and employee resistance to the HRIS technology.

RQ14: There will be a negative relationship between time availability and employee resistance to the HRIS technology.

RQ15: There will be a negative relationship between good timing and employee resistance to the HRIS technology.

**Objective 2 (Research Q3)**

RQ16: Employees will have fewer inhibiting factors after the context of the HRIS is explained than when they had no knowledge of it (i.e. There will be a negative relationship between knowledge of context of the HRIS and employee resistance to the HRIS technology).

**Objective 3 (Research Q4)**

RQ17: What level of social influence, among compliance, identification or internalisation, do HR employees exhibit from co-workers and friends with respect to the proposed HRIS technology?

## 3.3 Research Purpose and Strategy

Given the extent of the research problem, the literature review was crucial in narrowing the problem into a practical conceptual framework delineating associated key variables. This study attempts to gain insights into inhibiting factors to the HRIS technology adoption among general employees and HR employees. In addition, the influence of change context on inhibitors is examined. Finally, the study identifies the process of social influence from co-workers and friends in HR staff with respect to the proposed HRIS. Thus our study comprises to an extent explanatory, descriptive and exploratory aspects. The need to understand individuals' perspectives coupled with the diversity of key variables evident in the literature resulted in this study being dominated by a qualitative aspect.

Yin (1994) states that depending on the research question, a researcher may choose a research strategy among an experiment, a survey, history, archival analysis and a case study.

| Strategy | Form of Research Question | Requires Control over events |
|---|---|---|
| Experiment | Why, How | **Yes** |
| Survey | Who, What, Where, How, How many, How much | **No** |
| Archival Analysis | Who, What, Where, How, How many, How much | **No** |
| History | Why, How | **No** |
| Case Study | Why, How | **No** |

Table 3.2: Relevant Situations for Various Research Strategies

Source: Yin (1994)

Given the form of this study's research question and the fact that it focuses on the current natural environment, the survey research strategy is suitable.

## 3.4 Quantitative Sample

The sampling frame comprises the current population of general employees at Hulett Aluminium (Pty) Limited. The population size is 1280 employees. A sample comprising 200 employees (approximately 16% of the population) was taken to ensure a large enough sample size to comply with the Central Limit Theorem as well as account for the large diversity of the population, cost effectiveness and efficiency. The probability sampling technique used was that of $1^{st}$ level stratified random sampling. The stratification was along the dimension of the organisation's business units (i.e. the number of random samples were taken in proportion to the number of employees within each business unit) in order to ensure a representative sample and improve statistical efficiency. Samples were chosen, using randomly generated numbers, from personnel records of the respective departments.

## 3.5  Qualitative Sample

HR Employee population: The sampling frame comprised the current HR employees at Hulett Aluminium (Pty) Limited. The population size is 17 employees (this value excludes the HR director who forms part of top management and thus is predisposed to the HRIS concept). The non-probability sampling technique judgmental sampling was used to select participants, with the criterion being job description. The reason for this sampling technique was to increase the diversity of the sample, searching for input across the range of HR tasks. It must be noted that six of the HR employees comprise the medical clinic staff. After consulting with these individuals, it was discovered that they do not utilise the HR system significantly and as such were of less focus during sampling.

General Employee population: The sampling frame comprised the total number of poor attitude and good attitude responses received from the quantitative study. The population size is 1280 employees. To this sample frame convenience sampling was applied owing to worker shifts and availability. The number of subjects interviewed was determined by time availability and consistency of answers as interviewing progressed (i.e. in the first few interviews, issues arouse that had not been discovered before, which created questions to be asked in later interviews. It is only when no new findings arise that one could be sure the sample was large enough) (Lacey and Luff, 2001).

## 3.6  Research Instruments

The research technique was a sequential mixed-model, ex-post facto design and utilised a self-administered questionnaire for quantitative data collection and a semi-structured interview for qualitative data collection. The design was a cross-sectional (i.e. a snapshot), research design without a control group.

### 3.6.1  Quantitative Data Collection

The quantitative ex-post facto design utilised a self-administered questionnaire for data collection. For the purpose of this study a computer attitude questionnaire of items designed to measure computer anxiety, computer liking, computer confidence and

computer usefulness was selected. This was accomplished through the widely used Computer Attitude Survey (CAS) formulated by Loyd and Gressard (1986) and numerous subject related questionnaires. In addition, the independent variable Prior Computer Use was measured through a close-ended question asking the participant to select his/her frequency of computer use. The research instrument also comprised a cover letter that delineated a general data gathering purpose, instructions on answering the questionnaire, due date for responses and the method for returning the instrument. The CAS and cover letter are presented in Appendix A. The quantitative questionnaire comprised two sections namely:

➢ Section 1: A modified Gressard and Loyd Computer Attitude Survey (CAS) (1986).

➢ Section 2: Background Information

There are three popular scales used to measure attitudes, namely: 1) Likert scale, 2) Thurston differential scale and 3) Semantic-differential scale (Burns, 1997). The Likert scale is used in this study because it is a useful scale, which permits subjects' responses to be tabulated numerically and statistically analysed. The instrument used a combination of nominal and interval scales (Likert scale) with close-ended questions. The questionnaire was also pre-tested among a few employees to ensure that it was clear and simple to understand. Five positively and five negatively worded items in each of the subscales were used to help prevent respondents from seeing a pattern in the responses and modifying their responses in the light of this.

### 3.6.1.1    Reliability and Validity of the CAS Instrument

Table 3.3 lists the internal consistencies of the CAS subscales. The CAS was also tested by Woodrow (1991) and found that its subscales and overall reliability coefficients, shown in Table 3.3, were high indicating that each subscale was stable enough to be used separately. The general guideline for scale reliability is: "very good" ($r \geq 0.8$), "respectable" ($r \geq 0.7$) and "unacceptable" ($r \leq 0.6$) (DeVellis, 1991).

| Scale | Number of Items | Reliability | (Alpha) | |
|---|---|---|---|---|
| | | | Gressard & Loyd (1986) | Woodrow (1991) |
| Anxiety | 10 | 0.90 | 0.87 | 0.95 |
| Self-efficacy (Confidence) | 10 | 0.72 | 0.91 | 0.89 |
| Liking | 10 | 0.89 | 0.91 | 0.89 |
| Usefulness | 10 | 0.84 | 0.86 | 0.82 |

Table 3.3: Internal consistency reliabilities for the CAS subscales

Source: Author's

In a study conducted on undergraduate students in Israel, Francis et al. (2000) reported alpha coefficients of 0.84, 0.85 and 0.88 for three of the CAS subscales. Construct validity was demonstrated by correlations ranging between 0.21 and 0.53 with various measures of previous computer-related behaviour or behavioural intentions. Gardner et al. (1993), in another comparison of computer attitude scales, recommended this scale for research and observed that "it does appear that the CAS is becoming a measure of choice in research on computer attitudes...the CAS may be developing into a standard measure of computer anxiety, liking, usefulness and confidence."

### 3.6.1.2    Scoring of the CAS Instrument

The instrument is a 40-question instrument that measures four types of self-reported attitudes, (a) anxiety of computers; (b) liking of computers or enjoying working with computers; (c) confidence in ability to use or learn about computers and (d) viewing computers as useful, on the simple and widely used self-report Likert scale. A list of favourable and unfavourable attitude statements was presented and respondents were asked to respond to each statement on a five-point scale: strongly disagree, disagree, undecided, agree, and strongly agree. The scoring of the Likert scale was based on assigning weights from 1 to 5 for each position on the scale.

Favourable statements were weighted 1, 2, 3, 4 and 5 (from strongly disagree to strongly agree). Unfavourable statements had these weights in reverse order. Twenty items on the instrument have negative wording and were reversed before adding to the others, for

example, if the participant circled 1, it was made a 5; if the participant circled 4, it was changed to a 2. To generate an average for each subscale, the sum of the items were taken and divided by the number of items. Scores on the 10 questions in each subscale were summed for a subscale score. The four subscale scores may be added to produce a total computer attitude score. Higher scores represent attitudes that are more positive.

Coding of the other variables is shown in Table 3.4.

| Variable | Coding |
|---|---|
| Gender | Male = 1, Female = 2 |
| Age | Actual age |
| Education | Primary or lower = 1<br>High school or equivalent = 2<br>Technikon qualification = 3<br>University degree = 4<br>Postgraduate degree = 5<br>Other = 6 |
| Home computer | Yes = 1, No = 2 |
| Computer Usage | Daily = 365, Weekly = 52, Monthly = 12,<br>Yearly = 1, Never = 0 |

Table 3.4: Coding of the Quantitative Instrument Variables

Source: Author's

### 3.6.2 Qualitative Data Collection

The qualitative aspect of the study utilised a semi-structured interview for data collection. Given that the study comprises two distinct populations, two interview scripts were formulated based on the two levels of change. The interview scripts for the general employee and HR employee samples are presented in Appendix D and Appendix E respectively. In this study, the semi-structured interview technique allowed us to focus responses and to "compare" findings to that of the quantitative section, whilst permitting us to understand employees' underlying behaviour to technology resistance (i.e. to explore important factors related to technology adoption). Often the information obtained

from semi-structured interviews will provide not just answers, but the reasons for the answers. In this study, the questions gave the employee freedom to elaborate on common or identify new inhibitors or enhancers to technology adoption. The semi-structured interview approach also contributes to reducing interview duration, which is necessary given the participants schedules.

Several things need to be considered when conducting interviews. To strengthen the reliability of the data collected through the interview, an interview script was developed, piloted, and followed for each interview conducted. The script ensures that each interview follows the same format and covers approximately the same time period, and that each interviewee receives the same information. The script also provides structure so that both the interviewer and interviewee stay on topic. The semi-structured interview was based on the key factors discussed in the literature review. To enhance interviewing skills, the researcher referred to relevant literature as a first step and subsequently tried to gain some hands-on experience by conducting a few pilot interviews.

Three main criteria were adhered to when constructing questions (Anonymous, 1997), namely: relevance, selection of the proper respondents and ease of answering.

> ➢ Relevance - Questions should be directly related to the purpose of the study and have a good probability of yielding the kind of data desired.

> ➢ Selection of respondents - Even though a question may be relevant to the study, it may not be answerable by the people to whom it will be asked.

> ➢ Ease of response - Questions need to be relatively easy to answer and should not create embarrassment for or an undue burden on the interviewee. Among the types of questions that should be avoided are those that require respondents to consult records or other information sources, would make them uncomfortable for any reason, would reflect negatively on them, would make the interview confrontational, or have no specific answer.

Questions were also constructed based on questions used in similar literature, for example, Park (2003) and Stam et al. (2003). Open-ended questions were used during the pre-testing of the interview questions to elicit answers that contributed to the formulation of more specific questions and response alternatives. The questionnaires were pre-tested among a few employees to test for understanding and appropriateness.

Recording of responses was done on paper, which has its disadvantages. For, example, writing the answers while the respondent speaks takes less time than transcribing a tape, but it slows the interview down. The respondent will have to keep waiting while the recording interviewer makes notes (which is sometimes an advantage because the respondent thinks of more answers). To speed up the interviews, questions had checklists of common answers. On completion of each interview, the write up notes on the interview where done to ensure accurate representation of responses. The construct of social influence, among HR employees, was measured through Question 13 and the 10-item instrument used by Malhotra and Galletta (1999), and was an extension to the HR employee interviews (Refer to Appendix E).

### 3.6.2.1    Reliability and Validity: Qualitative Instrument

In order to attain validity for the qualitative section the study embraced Yin's (1994) advice for obtaining construct validity specifically: use multiple sources of information and have key informants review the report. For this study interview questions centred on key variables identified from multiple sources in the literature review. In addition, at the end of each interview, respondents were asked to comment on the conclusions drawn, for example, Am I correct in saying that the main factors that determine whether you adopt/use a technology are...?

Reliability in brief is whether the measures will yield the same results if applied to another technology or by other researchers. Reliability is difficult to attain for this qualitative study owing to the fact that interviews are to an extent inherently subjective. However, to facilitate greater reliability, findings were compared to that of the

quantitative study. In addition, the researcher followed the Ladder of Inference Model for helping him to become more aware of and discriminate among the four different types of information: *description* (objective and accurate report of an experience or observation), *inference* (a conclusion derived from beliefs or what are thought to be facts), *attribution* (an ascribed, inferred, or assumed cause, characteristic, or motive of another person) and *evaluation* (a determination about the value or "goodness" of a statement or action by another person), and their use in communication (Mitchell, 2001). With respect to replication, this study's research design is clearly delineated.

### 3.6.2.2    Reliability and Validity: Social Influence

Alphas for the three subscales underlying Social Influence are: Compliance = 0.7043, Identification = 0.8010 and Internalisation = 0.7234. However, when the two scales for Identification and Internalisation are combined, their composite reliability is higher than either of the two (Identification + Internalisation = 0.8690) indicating a close relationship between the two categories.

### Scoring of the Social Influence Instrument

The instrument is a 10-question instrument that measures the three subscales of social influence (a) internalisation (Q1, Q3, Q7); (b) identification (Q2, Q5, Q8) and (c) compliance (Q4, Q6, Q9, Q10), on a Likert scale. Owing to the short length of the questionnaire, favourable statements were presented and respondents were asked to respond to each statement on a five-point scale: strongly disagree, disagree, undecided, agree, and strongly agree. The scoring of the Likert scale was based on assigning weights from 1 to 5 for each position on the scale. To generate an average for each subscale, the sum of the items were taken and divided by the number of items.

## 3.7 Procedures

### 3.7.1   Administration of the Quantitative Instrument

The quantitative research instrument was applied in the natural working environment i.e. on site at Hulett Aluminium (Pty) Limited in Pietermaritzburg, South Africa. Owing to various working shift times and direct access limitations to employees, questionnaires

were distributed to the sample participants through the company's time clerks (i.e. individuals responsible for the logging of employees working times). A list of the departmental time clerks was obtained from the Human Resource department and time clerks were contacted via e-mail or telephone to explain the purpose of the CAS and their role in the quantitative aspect of the study. This distribution method ensured that participants received the questionnaire. Each time clerk was given a list of participants in their department together with respective cover letters, questionnaires and return envelopes.

Return of the instrument was facilitated through the company's internal mailing system. Follow-ups on non-response were done through the departmental time-clerks. It must be said that although much effort was made to achieve a 100% return rate, some employees did not seem to have the time to complete the questionnaires. Care was taken to conceal the HRIS context to prevent context contamination among respondents.

Checking respondents answers

Respondents' answers to statements in the questionnaires were checked during the value allocating stage, and were double-checked once entered into Microsoft Excel. Questionnaires that had been incorrectly filled out were removed from the sample. Those with non-response to certain questions were marked and the respective question removed from the averaging process thus, still allowing accurate scoring of results.

### 3.7.2 Administration of the Qualitative Instrument

Interviewed participants were interviewed with an informal approach so as to minimise apprehensiveness and reflexivity (interviewees give responses they think the interviewer wants to hear). The qualitative procedure used for the two populations was as follows:

> ➢ *General Employees*: Interviews were conducted at the participant's office, time-clerk's office or department tearoom. An official boardroom setting was avoided because it was believed to make the individual uncomfortable. Appointments were

made via the time-clerks to accommodate for various working schedules of participants. Informed consent from each participant was obtained

➢ *HR Employees*: Interviews were conducted in interviewee's offices. Appointments were made with individuals to account for various working schedules.

The length of interviews ranged from 25 minutes to one hour, with most averaging between 30 minutes to 45 minutes. Confidentiality was maintained through encoding of field notes. Interviewed participants were assigned a coded number. The researcher was careful to consciously construct an interview environment of empathy for the informant's experiences while maintaining an unbiased point of view. Descriptive questions (Spradley, 1979) were asked during the interview in order to generate data. These questions took the form of example questions and experience questions.

## 3.8 Data Analysis

### 3.8.1 Quantitative Data Analysis

This study used a two-prong approach to identify perceived inhibitors or enhancers to the HRIS technology adoption among general and HR employees. The data of the quantitative aspect of this study was analysed using the scores obtained from the CAS questionnaires. Each response in the questionnaire from the respondents was saved and manipulated using Microsoft Excel and SPSS Version 11.5. Descriptive statistics, such as frequency distributions, means, standard deviations, and percentages were used to describe data.

### 3.8.2 Qualitative Data Analysis

Analysing qualitative data is a challenge. However, the literature review of this study has identified common factors of interest, thus making analysis a little easier. Also, the quantitative CAS instrument allows comparison between some aspects of results. The main qualitative analysis techniques used in this study were:

➢ *Content Analysis*: Initially, the open-ended data was analysed using content analysis. Content analysis involves the reduction of text into categories consisting of a word, set of words or phrases, on which the researcher can focus. Specific words or patterns are indicative of the research questions and determine levels of analysis and generalisation (Smith, 1992). In this study the key variables as identified in the research framework form the main categories for analysis. This together with the semi-structured interview instrument facilitated easier analysis. To compliment content analysis, Spradley's (1979) domain analysis was used to determine patterns and themes. Domain analysis involves selecting semantic relationships, such as "strict inclusion" (i.e. means X is a kind of Y) and "cause and effect" (i.e. X is a result of Y, or Y causes X).

➢ *Grounded Theory*: Using aspects of grounded theory in our analysis allowed us to "fit" the emergent theory of our research data to that of theory cited in the literature review. Grounded theory is based on the concept of constant comparison. The data collection is done in parallel with data analysis and is termed "coding". The task is to identify categories (i.e. themes or variables) and their properties (i.e. their sub-categories). As coding progresses links between categories and/or about a core category emerge that provides theory. Once data of the core category and its linked categories become saturated, data collection ceases and sorting begins. Grounded theory does not test a hypothesis, but rather sets out to find what theory accounts for the research situation (Dick, 2002; Rudestam and Newton, 2001).

➢ *Triangulation*: Triangulation is the gathering and analysis of data from more than one source to gain a fuller perspective on the situation under investigation. In this study, triangulation involves combining insights from both qualitative and quantitative findings. A key strength of triangulation is the possibility of uncovering complexity and of finding different views (Lacey and Luff, 2001).

Finally a comparison had been conducted with the previous literatures for drawing conclusions.

# CHAPTER 4

## 4. Results

In this chapter the findings of this study are presented. It begins with descriptive statistics of the quantitative instrument and then proceeds to present the qualitative results. The qualitative data is based on exploratory and descriptive information of respondents' own words. In addition, frequently cited factors are isolated and used for presentation. The aim of this section is to present relevant data in a clear and simple manner.

### *4.1.  Quantitative Results*

Of the 200 quantitative instruments distributed to general employees, 110 (55%) valid responses were received, which form the basis of the results presented in this section. The descriptive profile of respondents is shown in Table 4.1.

| Characteristics | Frequency | Percentage (%) | Mode | Median |
|---|---|---|---|---|
| *Gender* | | | Male | |
| Male | 95 | 86 | | |
| Female | 15 | 14 | | |
| | | | | |
| *Age (in years)* | | | 31 | 36 |
| 20-24 | 5 | 4.55 | | |
| 25-29 | 22 | 20.00 | | |
| 30-34 | 21 | 19.09 | | |
| 35-39 | 16 | 14.55 | | |
| 40-44 | 15 | 13.64 | | |
| 45-49 | 12 | 10.91 | | |
| 50-54 | 10 | 9.09 | | |
| 55-59 | 8 | 7.27 | | |
| 60 and above | 1 | 0.91 | | |
| | | | | |
| *Education* | | | High School | |
| High school or equivalent | 53 | 48 | | |
| Diploma or equivalent | 40 | 36 | | |
| Primary school or lower | 8 | 7 | | |
| Degree | 5 | 5 | | |
| Postgraduate degree | 3 | 3 | | |
| Other | 1 | 1 | | |
| | | | | |
| *Home Computer* | | | | |
| Yes | 57 | 52 | | |
| No | 53 | 48 | | |

| Computer Usage | | | Daily |
|---|---|---|---|
| Daily | 83 | 75.45 | |
| Monthly | 1 | 0.91 | |
| Never | 10 | 9.09 | |
| Yearly | 1 | 0.91 | |
| Weekly | 15 | 13.64 | |

Table 4.1: Description of CAS respondents

Of the 110 respondents, 86% represented themselves as male and 14% represented themselves as female. This uneven distribution of gender is a current issue within the organisation and will be addressed in the near future. The minimum age was 22 years and the maximum 62 years. The average age of the respondents in the quantitative aspect of this study was 38.2 years of age. Respondents were asked to provide information regarding the level of education they had completed by checking one of the following choices: primary school or lower, high school or equivalent, technikon diploma or equivalent, university degree, postgraduate degree and other. Most respondents (92%) indicated either completing high school or higher level of education. These results correspond to the company's criteria for its specific job tasks, with most jobs requiring a minimum education level criterion of high school education.

The majority of the respondents (75%) indicated using computer technology on a daily basis at work. This is in-line with the high level of plant automation within the organisation. A wide variety of occupations were represented in the participants ranging from managers to plant housekeepers. The numerous professions that were represented include metallurgist, accountant, engineer, nurse, fitter, electrician, draftsman and laboratory technician. The varying professions captured in the sample are far from exhaustive, and the aforementioned occupations only list a fraction of the unique occupations that participated in the study.

Computer Attitude Survey (CAS) Results

Figure 4.1 delineates the distribution of attitude scores of the general employee respondents.
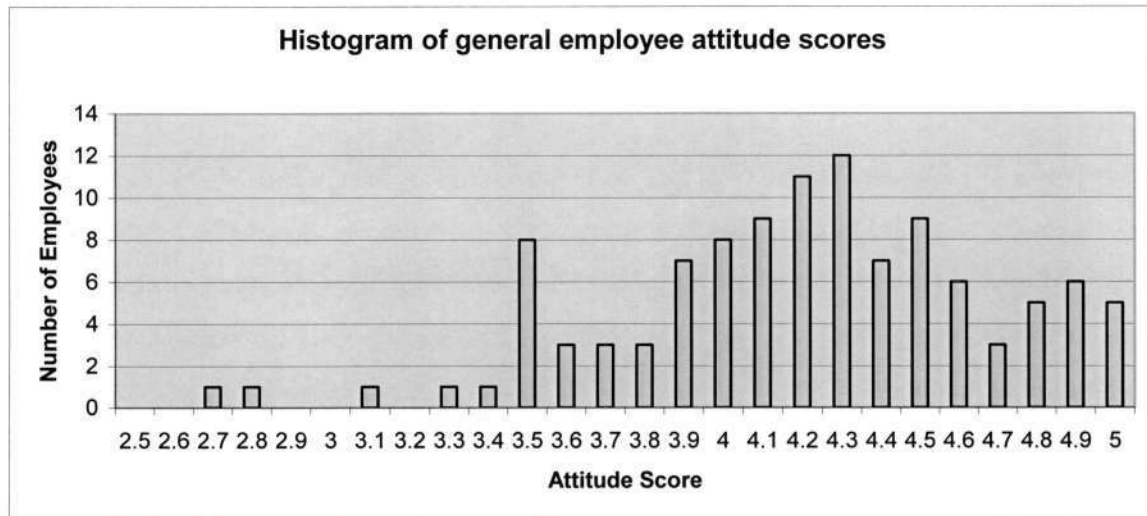
Figure 4.1: Histogram of general employee attitude scores

The results of the CAS instrument illustrate an average attitude score of 4.16, which is indicative of a positive attitude among respondents towards computer technology in general (5 = very positive, 3 = neutral, 1 = very negative). However, given the skewness of the results the median 4.175 is a better representation. The minimum attitude score was 2.6 and the maximum 5.0. The standard deviation (variability about the mean) was 0.477.

Table 4.2 presents the statistical summary of the four attitude subscales. Evident from this table is that usefulness (relative advantage) was considered the most important of the four subscales by respondents (Mean = 4.363). In addition, the lower standard deviation indicates that respondents had more similarity or less variance in their answers to this factor.

| Statistic | No Anxiety | Liking | Self-efficacy | Usefulness |
|---|---|---|---|---|
| Mean | 4.155 | 4.042 | 4.038 | 4.363 |
| Standard Error | 0.052 | 0.055 | 0.055 | 0.048 |
| Median | 4.200 | 4.000 | 4.100 | 4.400 |
| Mode | 3.700 | 3.900 | 4.100 | 4.200 |
| Standard Deviation | 0.549 | 0.578 | 0.572 | 0.500 |
| Skewness | -0.248 | -0.210 | -0.248 | -1.144 |
| Minimum | 2.9 | 2.7 | 2.5 | 2.5 |
| Maximum | 5 | 5 | 5 | 5 |
| Number of respondents | 110 | 110 | 110 | 110 |

Table 4.2: Summary statistics of the four attitude subscales

Table 4.3 depicts correlation results between the CAS variables and attitude towards computer technology.

| | Average Attitude | Anxiety | Liking | Self-efficacy | Usefulness | Usage | Have Computer | Gender | Age | Education |
|---|---|---|---|---|---|---|---|---|---|---|
| Average Attitude | 1 | - | - | - | - | - | - | - | - | - |
| Anxiety | .849(**) | 1 | - | - | - | - | - | - | - | - |
| Liking | .908(**) | .662(**) | 1 | - | - | - | - | - | - | - |
| Self-efficacy | .924(**) | .763(**) | .818(**) | 1 | - | - | - | - | - | - |
| Usefulness | .840(**) | .612(**) | .701(**) | .682(**) | 1 | - | - | - | - | - |
| Usage | .388(**) | .229(*) | .363(**) | .311(**) | .444(**) | 1 | - | - | - | - |
| Have Computer | -.163 | -.128 | -.124 | -.164 | -.166 | -.146 | 1 | - | - | - |
| Gender | .129 | .173 | .128 | .085 | .035 | .226(*) | -.118 | 1 | - | - |
| Age | -.321(**) | -.239(*) | -.287(**) | -.300(**) | -.316(**) | -.027 | .061 | .139 | 1 | - |
| Education | .317(**) | .308(**) | .212(*) | .311(**) | .316(**) | .361(**) | -.365(**) | .198(*) | -.179 | 1 |
| No. respondents | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 4.3: Pearson correlation results of CAS variables

Correlation tests are used to determine the strength of relationships between variables. The low correlation results above help convey the comment in earlier literature that demographic variables alone are inadequate in predicting attitude and technology use. However, it is worth mentioning that the positive correlation (0.388) between computer usage/experience and average attitude implies that respondents with more computer experience display more positive attitudes toward computers. The positive correlation (0.317) between education and average attitude suggests that individuals with higher levels of education have more positive computer attitudes. Also, the negative correlation (-0.321) between age and average attitude implies that older respondents have less positive computer attitudes. Note: these relationships were only mentioned by the researcher to highlight future results in this study and as such they are non-conclusive.

## 4.2. Qualitative Results

The main purpose of this study was to identify resistance factors or enhancers to the HRIS technology as perceived by general employees and HR employees. This section presents the results of the interviews for the two populations in this study. Presentation begins with a description of the study samples and then proceeds to address the research

questions. Analysis was done using a combination of content analysis and grounded theory. The reader must note that reference to the word "floor" in quoted data is a term used by employees to represent the factory floor area.

### 4.2.1. General Employees

Eleven general employees were interviewed of which ten (91%) were male and one (9%) female. These employees had the descriptive summary shown in Table 4.4.

| Respondent | Age | Education | Computer use | Occupation | Years in job |
|---|---|---|---|---|---|
| G1 | 27 | Diploma | Daily | Draftsman | 2.5 (2.5) |
| G2 | 39 | High school | Weekly | Fitter | 4 (4) |
| G3 | 30 | Diploma | Daily | Mill operator | 4 (8) |
| G4 | 62 | Primary school | Never | Housekeeping | 25 (25) |
| G5 | 41 | High school | Daily | Production clerk | 4 (18) |
| G6 | 27 | Diploma | Daily | Quality coordinator | 2 (4) |
| G7 | 28 | Diploma | Daily | Sequencer and planner | 4 (5) |
| G8 | 24 | Diploma | Daily | Auxiliary operator | 2 (2) |
| G9 | 35 | High school | Yearly | Fitter | 14 (14) |
| G10 | 56 | Primary school | Yearly | Journeyman | 34 (34) |
| G11 | 34 | Diploma | Weekly | Instrument technician | 3 (15) |
| Note: Values in parentheses () illustrate the number of years of service the individual has in the company. | | | | | |

Table 4.4: Descriptive profile of interviewed general employees

| Respondent | CAS Average | No Anxiety | Liking | Self-efficacy | Usefulness |
|---|---|---|---|---|---|
| G1 | 4.28 | 4.4 | 4.3 | 4.1 | 4.3 |
| G2 | 3.7 | 3.9 | 3.4 | 3.6 | 3.9 |
| G3 | 4.88 | 5.0 | 4.8 | 4.8 | 4.9 |
| G4 | 2.8 | 3.1 | 2.7 | 2.5 | 2.9 |
| G5 | 3.93 | 4.1 | 3.7 | 3.8 | 4.1 |
| G6 | 3.93 | 4.0 | 3.8 | 3.7 | 4.2 |
| G7 | 4.05 | 4.4 | 3.6 | 3.7 | 4.5 |
| G8 | 4.85 | 4.9 | 4.8 | 4.8 | 4.9 |
| G9 | 3.3 | 3.2 | 3.2 | 2.8 | 4.0 |

| G10 | 3.05 | 3.3 | 3.0 | 2.9 | 3.0 |
| G11 | 4.55 | 5.0 | 4.0 | 4.4 | 4.8 |
| *Mean* | *3.93* | *4.12* | *3.75* | *3.74* | *4.14* |

Table 4.5: CAS scores of interviewed general employees

The means of the CAS subscales provide an indication as to which of the four subscales the respondents associated most with. From Table 4.5 it appears that most respondents are comfortable with computers (No anxiety mean = 4.12) and believe that they are useful (Usefulness mean = 4.14). The usefulness (relative advantage) and anxiety subscales seem dominant among the four subscales.

Working Environment

Interviewees were asked to describe their working environment among seven categories: stressful, pressurised (busy but manageable), no autonomy/freedom, satisfactory, flexible, relaxed and other. Five (45%) respondents described their working environment as pressurised, two (18%) said it was satisfactory, one (9%) classified it as flexible, one (9%) described it as relaxed and another as having no autonomy to perform tasks. None of the respondents cited lack of time as preventing them from using or learning the HRIS. An important point to note is that although some respondents emphasised the lack of time in their schedule, they stated that they would make the time to learn the HRIS owing to the advantages it would provide. This statement suggests that relative advantage of the HRIS overrides the organisational factor time availability.

Context of the CAS

Question 7 of the interview script attempted to elicit the perceived context of the respondent when answering the CAS. Three respondents believed that the CAS was some sort of feasibility study conducted by the organisation before it embarked on a future computer related technology. Six respondents thought it was just a general statistical measure of employee computer knowledge for company records. Two participants said they didn't really know what the company wanted with the information and just complied with completing the questionnaire. With respect to the CAS raising any concerns (Question 8), eight respondents said that it raised no concerns. One respondent

commented that he was a little nervous about using computers because he has very little computer experience. Another respondent, who believed the CAS was part of a future technology initiative, was concerned about how employees on the factory floor would have access to computers. One respondent believed that the CAS had no direct impact on him and thus it raised no concerns.

## The Current HR System

The description of the current leave and HR associated process as cited by the general employee sample interviewed is illustrated in Table 4.6.

| Description of current system | Number of respondents |
|---|---|
| Current process is satisfactory | 2 |
| Slow | 5 |
| Wastes work time | 5 |
| Inconvenient | 8 |
| Information gets misplaced, lost or tampered | 2 |
| Information is not up-to-date | 2 |
| System is outdated | 1 |
| Information is duplicated | 1 |

Table 4.6: General employees' description of the current HR system

Respondents commented that most of their experiences with the present leave and HR process was unfavourable. This unfavourable experience was mainly attributed to inconvenience owing to the fact that only one HR employee attends to medical, pension fund, provident fund and car-scheme queries. This results in one waiting in queues to get simple queries resolved. In addition, plant employees need to arrange transport to the administration building as well as shuffle work schedules with supervisors. One respondent said that at times it is necessary to attend to these queries during one's personal time. Respondents who remarked that the current system is satisfactory said they could not comment much because they rarely used the system. An interesting finding was that two respondents mentioned having incidents in which their leave applications were tampered with. The result of these errors includes disciplinary action such as warnings or

docked pay. However, employees were more concerned about the image it portrays to co-workers and superiors.

Concerns about the HRIS

Question 10 and Question 11 of the interview were used to discover the inhibitors or enhancers towards the HRIS as perceived by general employee respondents. The frequency distribution of respondents' concerns is illustrated in Table 4.7.

| Perceived resistance variable | Number of respondents |
|---|---|
| Complexity (Perceived ease-of-use) | 10 |
| Training support | 2 |
| Anxiety (Nervous) | 1 |
| Fear of HR job loss (Perceived risk) | 1 |
| Additional responsibility (Perceived risk) | 1 |
| Loss of information owing to system crashing | 1 |

Table 4.7: Concerns of general employee respondents towards the HRIS

Ten respondents (91%) cited system simplicity or user friendliness as the most important feature that the HRIS should possess. All respondents considered the use of the system as straightforward, however two participants mentioned that they would have no concerns of complexity or any other concerns if training was provided. A respondent, who said that the system made him a little nervous, again mentioned the topic of training and said that he would be comfortable with the HRIS if training were given. Thus, it appears that the provision of training eases concerns of system complexity and personal anxiety towards the HRIS. It is important to note that the individuals that expressed concerns with respect to training and anxiety gave the lack of computer experience as their reason for concern. The concept of easy navigation was also frequently cited. Respondents' want easy to navigate screens and uncluttered program tools. An additional aspect linked to complexity mentioned by a respondent was that the screens must be easy to read: "I'm getting old, my eyesight isn't so good anymore. Bigger writing would be nice."

One respondent who had no technical worries with the HRIS technology, was concerned that implementation of this technology will result in HR job losses. When asked why he believed that he responded, "If this new system will do most of the admin work, what are the HR guys going to do." It would appear that the role of the HR department from the respondent's perspective is that of an administrative department with no other value adding activities. The HR manager also cited this negative perspective by employees of the HR function having no strategic value as an organisational concern and believed that the HRIS would improve the department's image. In addition, the individual believed that the technology would lead to additional responsibility for some individuals "whose time will be taken up by employees needing help with this new system". On the contrary, interviewees with supervisory duties believed that the HRIS would decrease the "burden" of helping employees.

Another respondent raised the concern of data being lost in the event of a system crash. This concern was based on an incident he had experienced with a similar system at his previous company. The respondent suggested that if the company intends running a redundant (duplicate) system a similar situation might be averted. This is a recommendation change agents should contemplate. This statement also illustrates the value of employee participation to improving the change.

Employee recommendations to introducing the HRIS

In order to elicit non-technology related factors of resistance to technology, Question 19 was introduced to understand how employees would want the HRIS change to be implemented. Applying content analysis to answers to this question revealed three factors that respondents considered crucial to making a change like the HRIS. Table 4.8 depicts the frequency of the three factors: communication, employee participation and training, as cited by respondents.

| Respondent | Frequency | | |
|---|---|---|---|
| | *Communication* | *Participation* | *Training* |
| G1 | 4 | 3 | 0 |
| G2 | 1 | 2 | 1 |
| G3 | 2 | 2 | 0 |
| G4 | 1 | 1 | 0 |
| G5 | 2 | 0 | 1 |
| G6 | 2 | 2 | 0 |
| G7 | 5 | 2 | 0 |
| G8 | 2 | 1 | 0 |
| G9 | 3 | 1 | 1 |
| G10 | 2 | 1 | 0 |
| G11 | 1 | 2 | 0 |
| Total | 25 | 15 | 3 |

Table 4.8: General employee recommendations to introducing the HRIS

During the interviews, each respondent without hesitation cited communication of the change as a crucial factor in implementing the HRIS change. Following communication, respondents believed that it was very important to obtain employee input and participation. Four respondents cited this study's interview process as a good example of employee participation. A few excerpts indicating this importance of communication and employee participation include:

➤ "I will make people part of the process. They must participate in all changes. People must know why they are doing things."

➤ "Communication is important because it helps us understand the reasons for doing things."

➤ "It is crucial to involve employees and introduce it to them. Explain the advantages and need of the system to them. Training is also very important."

Of significance to the researcher was the fact that respondents' continued to express their disappointment with the current level of communication and employee participation within the company. Respondents' comments were:

> "We don't know the bigger picture. I don't know management's plans or strategy. I would like to know about their plans and strategies to understand the bigger picture."

> "Communication between management and employees on the floor is non-existent. People in the offices look down on employees on the floor."

> Communication at present is very poor and needs to be improved. Guys on the floor don't know what's happening in the company. All we hear about is improving production and quality."

> Employees are the one's that know what the problems on the floor are and they have good suggestions to help, but management doesn't ask."

Another important theme that evolved from Question 19 was that respondents view management as having concern only for productivity and quality of products, and no regard for employee wellbeing.

### The HRIS and Social Influence

Data from Question 12 revealed that all respondents would use the HRIS because of the relative advantages it provides and not because of influence by significant others (friends and co-workers). All respondents commented that their co-workers would embrace the HRIS. However, three respondents cited older employees as possibly resisting the HRIS change. From the interviews of two respondents over the age of 55 years, the researcher was able to establish that the lack of computer experience was the cause of their anxiety. These respondents further elaborated that they had no concerns with the HRIS if training was provided.

## Relative Advantage

It is interesting to note that all respondents believed that the organisation needs a system like the HRIS. Numerous comments in support of the HRIS were observed while employees read the HRIS context document. Some supportive comments were: "I love it!" "This is good." and "Nice!" Other respondents nodded in approval. Relative advantage was the respondents' motivation to use the HRIS. The most important benefits perceived by the interviewees are shown in Table 4.9.

| Perceived relative advantage | Number of respondents |
|---|---|
| Saves time | 10 |
| Convenient | 11 |
| Instant access to information | 3 |
| Prevents data tampering | 4 |
| Up-to-date information | 1 |
| Fewer mistakes and data loss | 6 |
| Everyone has direct access to information | 1 |
| No duplication of data | 1 |
| It is easily traceable | 1 |

Table 4.9: Relative advantages cited by general employee sample subjects

The greatest benefit of the HRIS for respondents resided in it being more convenient and efficient than the current system. Another important advantage to respondents was that data was less likely to be misplaced or lost. Six respondents recalled incidents in which data was either misplaced or lost by the HR department that resulted in queries. These queries in turn caused time loss and inconvenience. Another respondent added to this theme stating that the traceability of the HRIS would facilitate leave disputes.

It must be noted that when participants responded to questions about concern (Question 11) regarding the HRIS, most said that it was important that it benefited them. Comments conveying this overriding importance of relative advantage include: "I have no worries as long as it makes my life easier." Though it may seem obvious, relative advantage appears to be the respondents' motivation for even contemplating using the HRIS.

Self-Efficacy and Anxiety

Respondents were asked to rate their confidence and comfort with using the HRIS on a Likert scale (Q14 and Q15). Table 4.10 illustrates the respondents' results with respect to the HRIS technology and their respective subscale scores from the CAS.

| Respondent | HRIS | | CAS | |
|---|---|---|---|---|
| | *No Anxiety* | *Self-efficacy* | *No Anxiety* | *Self-efficacy* |
| G1 | 5.0 | 5.0 | 4.4 | 4.1 |
| G2 | 5.0 | 4.0 (new system) | 3.9 | 3.6 |
| G3 | 5.0 | 5.0 | 5.0 | 4.8 |
| G4 | 3.0 | 3.0 | 3.1 | 2.5 |
| G5 | 5.0 | 4.0 (new system) | 4.1 | 3.8 |
| G6 | 5.0 | 5.0 | 4.0 | 3.7 |
| G7 | 5.0 | 5.0 | 4.4 | 3.7 |
| G8 | 5.0 | 5.0 | 4.9 | 4.8 |
| G9 | 4.0 (new system) | 5.0 | 3.2 | 2.8 |
| G10 | 5.0 (if training) | 4.0 | 3.3 | 2.9 |
| G11 | 5.0 | 5.0 | 5.0 | 4.4 |

Table 4.10: Anxiety and Self-efficacy results of general employee sample

Six respondents were very confident (Self-efficacy: 5 = very confident, 1 = not confident) that they could use the HRIS technology well. One respondent said that he would be very confident in using the HRIS if he had been given training first. Two respondents indicated that because the system was new it was unfamiliar and thus they would be fairly confident (i.e. self-efficacy = 4) in using it. The last two respondents cited their lack of computer experience for their lower self-efficacy scores. These two participants also rated themselves as having higher anxiety (i.e. a lower No Anxiety score) towards using the HRIS, verifying their answers from the CAS. These individuals' again indicated the lack of computer experience as the reason for their discomfort in utilising the HRIS. This finding implies that computer experience reduces anxiety. Another respondent with a higher anxiety score on the CAS (G10) said that he would have no discomfort with using the HRIS if training was provided prior to use.

## Trialability

The first respondent interviewed believed that, "it would be good to try this system first and test it to spot shortfalls." Given this statement, it was decided to include a question on trialability towards the end of the interview script. Interestingly, ten respondents (91%) said that trial of the HRIS is important and would make them more comfortable for the reasons depicted in Table 4.11.

| Advantage of trialability | Frequency |
|---|---|
| Helps identify problems in the system | 5 |
| Helps users get familiar with/learn the system | 8 |
| We can give suggestions on how to improve it | 1 |

Table 4.11: Advantages of trialability as perceived by general employee sample

Many respondents (91%) believed that trialability is an important vehicle to learn and familiarise themselves with the new system. Respondents also anticipate initial problems with the system owing to its novelty and therefore believe that trial of the HRIS will help resolve any initial problems. One respondent viewed trial of the HRIS as an opportunity to participate, through feedback, in both the change process and technology design.

## Training

Question 17 asked respondents how they felt about learning the HRIS. Five respondents said they would be excited, three said they feel positive, two were neutral and one said that he was a little nervous because he had very little computer experience. When asked what they believed was the best method of training for the proposed system, eight respondents (73%) mentioned a practical ("hands-on") training course. The two respondents with lower computer experience believed that an individual training session works best for them. When asked why, both respondents commented along the reasoning that they might need more help owing to their lack of computer experience. One respondent believed that the HRIS is simple and does not warrant training, and that a simple manual will suffice. Another respondent suggested that the company could save costs through training supervisors and then using the supervisors to train their respective team members.

### 4.2.2. HR Employees

The results presented in this section were collected using the HR Employee interview script (Refer to Appendix E). The descriptive profile of the HR employee sample is presented in Table 4.12.

| Respondent | Gender | Age | Education | Occupation | Years in job | Working Environment |
|---|---|---|---|---|---|---|
| H1 | Female | 38 | Diploma | HR Officer | 5 (5) | Okay to pressurised |
| H2 | Male | 39 | Degree | Training and development specialist | 4 (4) | Flexible |
| H3 | Male | 44 | Diploma equivalent | Employee benefits administrator | 4 (22) | Very pressurised |
| H4 | Male | 42 | Diploma | Skills development officer | 14 (14) | Very pressurised |
| H5 | Male | 41 | High school | Time attendant and supervisor | 6 (16) | Very pressurised |
| H6 | Male | 45 | High school | Training administrator | 10 (20) | Stressful |
| H7 | Female | 33 | Postgraduate degree | Senior HR officer | 2 (9) | Very pressurised |
| Mean | - | 40.3 | - | - | 6.4 (12.8) | - |
| Note: () illustrates the number of years of service the individual has in the company. | | | | | | |

Table 4.12: Descriptive summary of HR employee sample subjects

All respondents indicated using a computer on a daily basis to perform job tasks. The diversity of the sample's occupation, as observed in Table 4.12, illustrates the previously mentioned intent of the researcher to obtain input from various job contexts within the HR department.

### Working Environment

Four HR respondents described their working environment as being very pressurised with one respondent going further and describing it as stressful. Of significance is that none of the HR respondents cited lack of time as preventing them from either using or learning the HRIS technology. A possible explanation is that respondents viewed the HRIS as simplifying their job tasks and aiding in improving their working environment. Substantiating this chain of thought were comments (e.g. "This is good!") and behaviour

(e.g. nodding in approval) observed whilst respondents read the context document on the HRIS. All respondents also indicated that there was a need for the HRIS.

## Context about computers in general

To investigate the influence of context on resistance variables among HR respondents, participants were asked how they felt about computer technology in general (Q7 and Q8). Five of the seven respondents said they were very confident, whilst the other two said they were confident in using computers. All of the respondents stated that computer technology raised no concerns and that they where totally comfortable in using computers in their jobs. The importance of computers in assisting respondents in their job was evident from statements like, "We'll die without them" and "It is a necessity in today's world".

## The Current HR System

Table 4.13 presents the description of the current HR system as cited by the HR employee sample.

| Description of current HR system | Number of respondents |
|---|---|
| Current process is satisfactory | 3 |
| Current system is slow | 3 |
| Complex and non-user friendly | 5 |
| Current system is outdated | 2 |
| Current system is inflexible | 2 |
| Information is not up-to-date | 1 |
| Current system is outdated | 1 |
| Current system is not integrated | 5 |

Table 4.13: HR sample's description of the current HR system

Although three respondents commented that the current HR system was satisfactory in performing their duties, their comments were followed by a few negative remarks. These three respondents' answers may be explained by their lack of exposure to other technology i.e. they have been in the company's service exceeding ten years and stated that they had not experienced any other related technology. A large number of

respondents (71%) cited that the current HR system was complex, especially with respect to using the database and report generation and writing tools. This complexity was attributed mainly to the inflexible procedures of the system when manipulating data.

Another frequently cited dislike with the current system was that data used by respondents to perform job tasks was usually distributed among several different systems (i.e. a non-integrated system), which requires one respondent to rely on obtaining data from another respondent. This process is inconvenient and generally results in HR employees' time to completion of tasks being dictated by other individuals.

Concerns about the HRIS

Table 4.14 presents the inhibitors towards the HRIS as perceived by the HR employee sample. Question 10 and Question 11 of the HR employee interview script were used to elicit this information.

| Perceived resistance variable | Frequency |
|---|---|
| Complexity (Perceived ease-of-use) | 7 |
| Training support | 1 |
| Technical support | 5 |
| Fear of HR job loss (Perceived risk) | 1 |
| Security | 4 |

Table 4.14: Concerns of HR employee respondents towards the HRIS

From Table 4.14 it is evident that all HR respondents consider complexity as the main technology factor that would prevent them from using a technology. With respect to the HRIS, HR respondents cited system security and confidentiality of data as a crucial factor. Respondents stated that given the personal nature of the information they house, security is a key factor to any HR information system. Another important concern was that of technical support. Five respondents commented that owing to their negative experience with the technical support of the current system, this issue now forms a key aspect in them using any future technical systems.

Another respondent cited that training would be important given that the HRIS would be unfamiliar to him. As interviews progressed the researcher observed that respondents assumed that training would accompany the HRIS. Therefore, the theme of training may be considered an important aspect to HR respondents adopting the HRIS. One respondent raised the factor of perceived risk, with respect to job loss. However, this concern was for time-attendance individuals and not the respondent. Interestingly, interviewed time attendance individuals expressed no such concern and displayed enthusiasm for the HRIS. This incident again emphasises the misunderstanding among respondents with regard to the role of HR employees. Causing confusion though is the fact that this respondent is a HR employee. This confusion may be explained by the structure and physical layout of the HR department: time-attendance supervisors operate under the departmental umbrella of accounting and as such do not interact directly with most "HR" staff. Another explanation might be that the individual is oblivious to the actual duties of time-attendants.

Employee recommendations to introducing the HRIS

Question 15 of the HR employee interview script was used to elicit non-technology related factors of resistance to change. Table 4.15 illustrates the factors that HR respondents considered important in implementing the HRIS change.

| Respondent | Frequency | | | | |
|---|---|---|---|---|---|
| | *Communication* | *Participation* | *Training* | *Feasibility study* | *Technical support* |
| H1 | 1 | 2 | 1 | 0 | 0 |
| H2 | 3 | 2 | 0 | 0 | 0 |
| H3 | 2 | 3 | 0 | 1 | 0 |
| H4 | 4 | 1 | 1 | 0 | 0 |
| H5 | 2 | 2 | 1 | 0 | 0 |
| H6 | 3 | 2 | 1 | 0 | 1 |
| H7 | 5 | 2 | 1 | 1 | 1 |
| **Total** | **20** | **14** | **5** | **2** | **2** |

Table 4.15: HR employee recommendations to introducing the HRIS

As with the findings among the general employee sample, communication and employee participation were the factors that HR respondents believe are crucial to introducing the HRIS change. Once again respondents extended the theme of poor communication and non-existence of employee participation to being the culture of the organisation. This theme is evident in the following statements made by respondents:

➤ "Poor communication and no employee input have become the norm in this company."

➤ "Communication is terrible. Employees don't participate, management enforces decisions."

➤ "The culture sucks! Participation is not practised and employee decisions are over-ruled."

Communication and employee participation proved to be a recurring theme in this researcher's experience interviewing eleven general employees and seven HR employees. Of particular significance to the researcher were the comments by senior officials, which verified this central theme of poor communication and lack of employee participation, "Communication with employees must be improved both in method and intensity. It is way below average." In addition, respondents were critical of the communication within their respective departments i.e. between the managers and themselves.

## The HRIS and Social Influence

All HR respondents believed that the HRIS would improve their relationship with co-workers and employees. HR respondents believed that benefits for employees resided in the department being able to provide a better service through faster processing of queries and access to current information. Improvements among co-worker relationships focused on HR respondents having direct access to data they needed, thus preventing co-workers from "chasing" each other for data and getting involved in conflict. One respondent also stated that the integrated system would enhance teamwork through facilitating better cooperation among members. Respondents in general believed that their use of the HRIS

would be not be influence by co-workers or friends, but because of the benefits it would provide in performing their job tasks. Table 4.16 presents the results of the social influence instrument used to measure HR respondents' level of social influence to the HRIS. The range of the instrument is from 1 to 5, with 5 indicating a strong association to a social influence level and 1 a weak association.

| Social Influence level | Respondent | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **H1** | **H2** | **H3** | **H4** | **H5** | **H6** | **H7** | **Average** |
| *Internalisation* | 3.33 | 3.67 | 5.00 | 4.33 | 4.00 | 3.33 | 4.67 | 4.05 |
| *Identification* | 4.00 | 4.67 | 5.00 | 5.00 | 4.67 | 4.00 | 4.00 | 4.48 |
| *Compliance* | 2.25 | 1.75 | 2.00 | 1.00 | 3.25 | 3.50 | 2.00 | 2.25 |

Table 4.16: Social Influence levels of the HR sample

Table 4.16 indicates that majority of the HR respondents exhibit Identification and Internalisation levels of social influence (i.e. average scores of 4.05 and 4.48 respectively) with respect to the HRIS, which suggested that respondents are likely to be committed and enthusiastic in their use. This finding was supported by respondents through their statements that they would use the HRIS because it would assist them in their job and not because co-workers or friends believe that they should. The lower scores on Internalisation are attributed to the fact that three respondents did not know what the company's values were and as such indicated a neutral score on these questions. This unawareness further contributed to the poor communication theme in the data. The most important finding was that six of the seven respondents scored low with respect to compliance. This indicated that the HRIS would not be adopted based on the expectation of gaining rewards or avoiding punishments.

Relative Advantage

Respondents from both samples considered relative advantage as fundamental to adopting any technology. The most important benefits perceived by the HR interviewees are illustrated in Table 4.17.

| Perceived relative advantage | Number of respondents |
|---|---|
| Saves time | 7 |
| Is more convenient | 7 |
| Access to more information | 5 |
| Fewer mistakes and data loss | 5 |
| No duplication of data | 2 |
| Up-to-date information | 2 |
| Improved organisation of data | 1 |
| More flexibility through application tools | 2 |
| Better team working | 1 |

Table 4.17: Relative advantages cited by HR sample subjects

Table 4.17 conveys that for HR respondents' time saving and convenience were the greatest benefits of the HRIS. All respondents cited that the HRIS will help free time for them to focus on more pressing tasks and allow them to perform more effective planning. Another important advantage to respondents was that data was less likely to be incorrect or lost. During an interview one respondent pointed to her desk laden with paper and said: "Look at this!" Two respondents that need to perform business and recruitment planning welcomed the thought of the HRIS planning applications. These participants believed that the HRIS would permit them to contribute value to the business. One respondent commented, "This system would have really helped during our strike," referring to the 2004 wage strike, in an attempt to communicate her perceived usefulness of an integrated system during crisis situations.

Self-Efficacy and Anxiety

Respondents were asked to rate their confidence and comfort with using the HRIS on a Likert scale (Q17 and Q18). All HR respondents indicated that they would be completely comfortable with using the HRIS (i.e. each respondent indicated an anxiety score of 1). With respect to self-efficacy, four respondents (57%) cited that they were very confident (self-efficacy score = 5). Two respondents said they were confident (self-efficacy score = 4), but because the HRIS was new and unfamiliar they anticipate a few minor problems.

The last respondent indicated that she was confident, but would be more confident if training was given.

## Trialability

Each and every HR respondent believed that trial of the HRIS is important for either one or a combination of the reasons shown in Table 4.18.

| Advantage of trialability | Number of respondents |
|---|---|
| Helps identify problems or anomalies in the system | 3 |
| Helps users get familiar with/learn the system | 4 |
| Highlights things (tools) users need and things they don't | 1 |
| Allows one to see how it performs | 2 |
| We can give suggestions on how to improve it | 1 |

Table 4.18: Advantages of trialability as perceived by the HR employee sample

The HR respondents' perspective that trialability presents an opportunity to identify anomalies and become familiar with the new system corresponds to the findings among the general employee sample. Of interest was that two respondents believed that trialability would permit them to observe the performance of the HRIS, which is representative of Rogers (1995) variable of observability. One HR respondent viewed trial as an opportunity to identify valuable application tools, whilst another believed it was a good way to provide recommendations for system improvement.

## Training

With respect to learning the HRIS (Q20 and Q21), six of the seven HR respondents said they would be excited and one said she was comfortable. Each and every respondent believed that training on the HRIS would be necessary and that the most appropriate method of training would be a practical training course. Three respondents also explicitly cited that the best method to learn would of course be time and practice. It should be noted that HR respondents assumed that training would be provided with the implementation of the HRIS. Their assumption was based on previous experience of technology introduction and that the system would be new to the company.

### Technical Support

Technical support proved to be very important to HR respondents as was discovered from Question 10 and Question 11. Question 22 further explored the importance of technical support to respondents and the type of support they preferred. All HR respondents indicated that technology support is an important factor in them using a technology. Five respondents based their decision on the basis of the poor technical support structure of the current HR system. Respondents complained that logged technical complaints were often only attended to after a few days and that this poor response time often resulted in loss of valuable time and other costs. All respondents believed that the most important factor in good technical support was quick response. Of the seven respondents only one supported the concept of a call-centre. Respondents' disdain with call-centre support lay in past experiences of long waiting periods and non-response. The interesting concept of email support for minor queries surfaced as being favourable among all HR respondents.

# CHAPTER 5

## 5. Discussion, Conclusion and Recommendations

This chapter has three sections: 1) Overview, which concisely captures study purpose and method; 2) Discussion of results, which discusses possible reasons for the results; and 3) Conclusion and Recommendations, which identifies possible suggestions for management to facilitate successful implementation of the HRIS, for improvement of the current study and implications for future study.

### Overview

The purpose of this study was to identify factors of resistance or enhancers to the proposed integrated Human Resource Information System (HRIS) as perceived by general employees and HR employees, representing adaptive and high-adaptive change levels respectively. In the present study, four categories of variables (individual, technological, organisational and external) known to relate to technology resistance were identified based on a review of change theory, innovation diffusion and technology adoption models, which were used to formulate a research framework.

The study used a two-prong approach to address the research questions posed in chapter one. Owing to the large general employee population, a quantitative computer attitude survey was used to identify general employees with poor and very positive attitudes. These individuals then formed the sample frame from which the general employee sample was taken, since it was believed that these individuals would yield the most useful data. With respect to the HR employees, a judgmental sample was taken based on the criterion of job tasks in order to obtain a diversity of inputs from all possible users of the HRIS. The two sample groups were then interviewed using semi-structured instruments to obtain data necessary for answering the research questions. Qualitative data from the interviews was analysed using content analysis, domain analysis and the constant comparative concept taken from grounded theory.

## Discussion of Results

Results and possible reasons for results are discussed in this section for each of the four research questions.

*Factors that general employees (adaptive change level) and HR employees (high-adaptive change level) consider as important inhibitors or enhancers to the HRIS technology adoption (Research Q1 and Research Q2).*

Rogers' (1995) work, which began in 1962, has influenced the empirical research on identifying technology characteristics that affect adoption for the past 42 years. In the findings of this study the technology characteristics relative advantage, compatibility and complexity were prominent between both general employee and HR employee samples. These findings correspond to those of Rogers (1995) and, Surry and Gustafson (1994) (in Park, 2003), which suggest that relative advantage, complexity and compatibility are the most often mentioned characteristics by adopters of a proposed innovation. Crucial propagation and organisational factors in the current study were communication, employee participation and support (which comprise training and technical support). These findings concur with those of Ram (1987), Gustafson (2003), Park (2003) and, Kirkpatrick (1985), which imply that clear informative communication, employee participation and support structures are crucial attributes to overcoming change resistance.

With respect to individual/personal characteristics, all respondents indicated high confidence in using the HRIS. Compeau and Higgins (1995) (in Eastin and LaRose, 2000) empirically verified the positive relationship between computer self-efficacy and computer use. Findings in this study support this relationship, with respondents having more computer experience indicating higher self-efficacy levels. In addition, a common theme was that experience or familiarity determines anxiety. Studies supporting this finding comprise Koohang (1987) (in Whitrow, 1999) and Sacks et al. (1993), which identified a positive correlation between lower anxiety and computer experience.

Brosnan (1996) suggested that current technology usage is predicted by ease-of-use, whilst other technology usage is predicted by computer anxiety. Computer anxiety is in turn predicted by self-efficacy and how much 'fun' a computer is thought to be. With regard to this study, the technology is new and thus according to Brosnan (1996) would most likely be predicted by computer anxiety, which in turn is influenced by computer experience. Thus, the acknowledgement by respondents that training will ease their anxiety is extremely valuable to change agents.

Respondents from both samples considered relative advantage as fundamental to adopting any technology. Respondents wanted to know, "What will it do for me? Why would I want to use this technology?" This finding is in keeping with the findings of the CAS instrument in this study, Rogers (1995), Cooper and Zmud (1990), Rousseau and Tijoriwala (1999), and Vinson (1996) (in Park, 2003), which found that among the five technology characteristics the most significant predictor of technology use was relative advantage. The importance of relative advantage was also evident from the CAS results i.e. it had the highest score among the four subscales. Relative advantage also mediated the organisational variable time availability on HRIS technology use, with respondents saying that they would make the time to learn and use the HRIS despite their busy schedules. Groves and Zemel (2000) found that faculty members perceived time needed to learn as an important factor in influencing use of technology, which is supported in the case of this study.

Tomatzky and Klein (1982) (in Grunwald, 2002) in their meta-analysis identified compatibility and relative advantage as the two characteristics most positively related to adoption. The only other consistent finding in their analysis was that complexity was negatively related to adoption. Findings among the general employee and HR samples support this negative relationship between complexity and technology adoption. Ten general respondents (91%) and seven HR respondents (100%) cited system simplicity or user friendliness as another important feature that the HRIS should possess, after relative

advantage. This result concurs with findings of a number of research studies (Davis, 1989; Bagozzi et al., 1992; Rogers, 1995).

The Technology Acceptance Model (TAM) developed and examined by Davis (1986) and Davis et al. (1989) discovered that relative advantage (perceived usefulness) has an indirect effect on complexity (perceived ease-of-use). This finding implies that even if employees perceive a technology as easy, they would not use the technology until they perceive it as being better than the one it supersedes. This theory complements the findings among the general employees who although perceived the HRIS as straightforward, wanted to know why they should use it. The description of the current system as being slow, inconvenient, outdated and unreliable, by both HR and general employee samples, may be interpreted as dissatisfaction with the status quo, which is an environmental condition identified by Ely (1999) as playing a significant role in facilitating implementation of innovations.

The current study identified the importance of compatibility to be stronger among respondents with more to gain from the HRIS (i.e. HR respondents displayed stronger levels of compatibility, toward the HRIS, than general employees). This suggests that compatibility and relative advantage are positively correlated as was the findings of Tornatzky and Klein (1982) (in Grunwald, 2002). This may be explained by the fact that the HRIS affects HR respondents' jobs directly, whilst only providing a better service for general employees. Therefore, implying that the need in HR employees was stronger.

The other technology characteristic that featured prominently, between both HR and general employee respondents, in this study's findings was trialability (in support of Rogers, 1995). Respondents considered trial of the HRIS as important because it allowed them to become familiar with the system. Echoing this theme is the study by Czaja and Sharit (1998), which demonstrated that providing users with an opportunity to interact with unfamiliar technology is an effective means of attitude change. Respondents from

both samples also saw trial as an opportunity to participate in the design of the HRIS. Of interest was that two respondents believed that trialability would permit them to observe the performance of the HRIS, which is representative of Rogers (1995) variable of observability. Trial may be viewed, to some degree, as experience with the technology. Results from this study suggest that respondents display less anxiety towards the HRIS the more computer experience they have.

Communication was found to be an imperative factor for both change levels. The variable communication as used in the results section of this study encompasses the propagation mechanism characteristics: clarity and informativeness. That is both general employee and HR respondents believed that clear and informative knowledge of the HRIS change is the first step in implementing the HRIS change. However, both samples emphasised that communication alone is not sufficient and that involving employees (participation) in all stages of the change was equally important. The suggestion by a respondent, with experience in using a similar technology at a previous company, that the company run redundant systems to fortify system reliability is a perfect example of the value of employee participation to improving the change.

These findings and their importance in change are supported in most if not all change management literature and dates back to Zander's research in 1950. Other findings emphasising the importance of clear communication and employee participation include:

➢ Robbins and Decenzo (2001), Kotter and Schlesinger (1979), Kirkpatrick (1985), Morris and Raben (1995) and Lee and Steinberg (1980) (in Gustafson, 2003) which found that successful change was positively correlated with clear informative objectives and need for the change.

➢ Kirkpatrick (1985), Malhotra and Galletta (1999) and, Prosci Change Management Learning Center findings (2003), which identified that individuals resist change if they are not allowed to participate in the change initiative and are not given an opportunity to provide any input. Being omitted from the decision-

making process means that users are not personally invested in the use of the new systems.

Of significance at this point that needs mentioning is that these two factors of poor communication and lack of employee participation was perceived by respondents in both samples as being the norm within the organisation i.e. as being part of the organisation's culture. In addition, these issues span employee service to the company i.e. it was cited as a problem by both recent employees and those that have been with the company for more than 20 years. Another important theme that evolved was that respondents view management as having concern only for productivity and quality of products, and no regard for employee wellbeing. This finding may be likened to that of Kirkpatrick's (1985), which identified that lack respect for change agents may result in employees being unable to view the change initiative objectively.

Unlike Wadell and Sohal (1998), Kirkpatrick (1985) and, Fullan and Stiegelbauer (1991) this study did not find perceived risk to be prominent among its findings. This finding was expected because the levels of change in this study were adaptive and high-adaptive and as such was not considered particularly threatening (Carson, 1998). The concern for HR job losses by a general employee respondent indicated the misunderstanding among general employees that the HR department has no value-adding role in the organisation. A senior HR staff member, who believed that the HRIS would help improve the department's image, also cited this negative perspective among employees. No fears of job loss were evident among HR employees themselves and all exhibited positive attitudes towards the HRIS.

*Additional important factors with respect to the HRIS technology*

General employees

In addition to relative advantage, complexity, compatibility, trialability, communication and participation, a few general employee respondents cited training as an important

factor to adopting the HRIS. These respondents based their need for training on their lack of computer experience. Another respondent mentioned that training would ease his anxiety, which was also attributed to lack of computer experience. These findings imply that the provision of training eases concerns of system complexity and personal anxiety. This inter-relationship between computer experience, anxiety and training is supported in Howard's (1986) study. Howard (1986) suggests that training and experience will address much of the anxiety that exists with using technology. He did warn however that short-term, high intensity training programs are ineffective. Other studies supporting this theory are Gressard and Loyd (1987) and Woodrow (1992), whose findings suggest that computer training or computer instruction significantly decrease anxiety about computers while confidence and computer liking are increased. Lori Butchko (2001) confirmed conclusions of earlier research that computer experience of workers and not age was a better predictor of computer anxiety (i.e. more experience implies less anxiety).

Another interesting finding was that one respondent believed that the HRIS change would result in more responsibility and unwanted work for some individuals owing to them needing to aid others in using the HRIS. A similar finding was expressed among the top five reasons for resisting change from the Prosci (2003) "Best Practices in Change Management" benchmarking study, which included data from 288 organisations. In contrast however, other respondents envisaged the HRIS change as reducing other employees need for assistance.

### HR employees

The factors of relative advantage, complexity, compatibility, trialability, communication and participation were found to be important in both change levels of this study. Like Mackie and Wylie (1988), Groves and Zemel (2000), and Park (2003) this study demonstrates that user acceptance of technology is affected by the availability of technical and training support. Employees may resist technology adoption if the necessary technical support is perceived as a burden. The inclusion of technical support as an important variable in resistance to technology, by HR respondents with experience

of poor technical support, is evident of MacDonald's (1998) suggestion that experience influences perspective and that the two go hand-in-hand.

Interestingly, HR respondents assumed that training would accompany the HRIS and thus perceived it as necessary based on the fact that it would be unfamiliar (lacking experience) to them. Therefore, it is evident that this change creates uncertainty and that training support is seen as a moderator of uncertainty. Again, as was discussed earlier, the relationship that training and experience mediate uncertainty is supported in Howard's (1986) study.

Security of the HRIS was another important concern among HR respondents. Respondents stated that given the personal nature of the information they house, security is a key attribute of any HR information system. This concern may be explained by the fact that some respondents misunderstood the level of access to data that employees would have with the HRIS i.e. they believed that employees will have access to confidential data other than their own. This issue further emphasises the importance of clear communication during change initiatives.

The findings of this study conveying the importance of non-technological factors, such as communication and participation, in technology change initiatives also complete the understanding of the research problem for the researcher. That is, initially the researcher was going to utilise a technology characteristic instrument such as the TAM or CAS to determine inhibitors and enhancers to the HRIS change. However, the findings in this study communicate the shortfall of single-category instruments and studies to fully understand inhibitors or enhancers to technology change in order to allow successful implementation. Therefore, this study has provided crucial insight and understanding of technology change for both the researcher and management.

*Research Question 3: How does knowledge of the HRIS change context affect inhibiting factors of technology adoption?*

The findings of the study did not conclusively verify the researcher's initial postulation that knowledge of the HRIS context would reduce the number and/or intensity of resistance factors that respondents had before its knowledge. However, comparing the self-efficacy and anxiety scores of the CAS to those in the interviews (i.e. the HRIS context), suggests that respondents where more confident and comfortable after the HRIS context was explained. It must be noted that knowledge of the context did not raise more concerns among employees, but questions intended for clarity of understanding.

A possible explanation derived from the findings is that when respondents realise that the change affects them directly, they immediately perceive it as them having much more vested and therefore show more concern in the change process (Robbins and Decenzo, 2001). This was evident in one respondent's view with respect to the CAS, who commented that because the CAS did not appear to affect him directly he just complied without giving it much thought. A follow-up after the interviews revealed that once respondents have an initial concept of how the technology is supposed to work, they give the idea much more critical thought than if it were just a general concept. Also, the importance that respondents placed on communication and participation implies that knowledge of the HRIS change context is crucial to reducing resistance to the change.

*Research Question 4: What level of social influence do HR employees exhibit from co-workers and friends with respect to the proposed HRIS technology?*

Unlike Park (2003) and, Marcinkiewicz and Regstad (1996) subjective norm was not found to be directly predictive of HR respondents' intent to use the HRIS. Relative advantage was found to mitigate social influence among HR and general employee respondents i.e. respondents believed that if the HRIS provides valued benefits to them, the opinions of significant others (friends and co-workers for this study) are not as important (in support of Malhotra and Galletta, 1999). HR respondents were found to

exhibit identification and internalisation levels of social influence with respect to the HRIS which, according to Kelman (1967) (in Malhotra and Galletta, 1999), suggests that respondents are likely to be committed and enthusiastic in their use.

In must be noted however, the effect of internalisation was not completely representative owing to the fact that three respondents did not know what the company's values were and as such indicated a neutral score on respective questions. This unawareness further contributed to the poor communication theme in the data. More importantly, respondents scored low with respect to compliance indicating that the HRIS would not be adopted based on the expectation of gaining rewards or avoiding punishments, indicating that it is not necessary to "buy" employee support for the HRIS. When social influences generate a feeling of compliance, they seem to have a negative influence on the users' attitude toward use of a new information system. However, when social influences generate a feeling of internalisation and identification on the part of the user, they have a positive influence on the attitude toward the acceptance and use of the new system.

## Conclusion and Recommendations

This study supports the conclusions of many researchers (Ram, 1987; Rogers, 1995 and Park, 2003) that resistance to technology change is complex incorporating technological, personal, organisation, propagation (communication), social and other external variables. Thus although models such as the TAM are useful, they are limited in their use. The findings also verify that each individual will respond to a change differently owing to their different perceptions. This study has achieved its purpose of identifying the main inhibitors or enhancers to the HRIS technology change as perceived by general employees (adaptive change) and HR employees (high-adaptive change). Following from this study are two areas of recommendations:

1. Recommendations on how to improve the possibility of success of the HRIS technology change.

2. Recommendations for improvement of the current study and areas for further research.

## Implications for management

Based on findings in this study, recommendations are made about how the organisation might create conditions conducive to the integration of a technology, such as the HRIS. The results regarding the propagation and organisational variables communication and employee participation and their role in resistance to change require special attention. The importance of these two variables as illustrated by the participants in this study cannot be overemphasised. In the absence of clear, informative communication and employee involvement, adopters may resist even the most technologically superior innovation. These two factors have crucial impact within the context of this study because employees in both change levels have expanded poor communication and lack of employee participation to being a part of the organisation's culture. Thus, this has significant ramifications and needs to be management's first area of focus.

Communication and employee participation appear to be the organisation's greatest weakness. Issues of organisational communication, priorities and mission are all subject for closer study before attempts at implementation have a chance at success. This will require an investment of resources and a genuine commitment from management. The other important "culture" related theme that evolved was that employees view management as having concern only for productivity and quality of products, and no regard for employee wellbeing. This finding may translate into lack of respect or credibility for management (Kirkpatrick, 1985). Therefore, management should invest in transforming their current relationship with employees from being enforcers to being team players and mentors. This is a steep objective and can only be achieved over time, but one that is necessary if the organisation intends competing in the global competitive marketplace. The company's people need to emerge as a core competency.

Thus, it is recommended that the first step to initiating the HRIS or any other change is to educate people about the change effort beforehand. Up-front communication and education helps employees see the logic in the change effort. Change agents should note that a structured manner of communication is vital so as to ensure clear, informative and

non-distorted information transfer. The risks of unstructured communication include rumour mill effects, which can then add to resistance to the change.

Possible communication avenues available to change agents are company newsletters, email and vision sessions. Another important point to note is that the initial communication of the change should be done by top management, since it boosts employees' self-esteem and commitment, and conveys their value to the company. This rationale of organisational support has been shown to predict technology use (Anandarajan et al. (2002) in Brown, 2002). Leadership commitment is a key feature for successful implementation and forms a research subject on its own. Lewis (1997) (in Malato, 2001) suggests that a shared vision elevates employee aspirations giving their role in the organisation greater meaning.

During the communication process, change agents should elicit employee input to help them buy into the change rather than resist it. Employee participation helps pinpoint the problem areas and bottlenecks of the process or organisation, thus presenting decision-makers with a clearer picture of the problem. This in turn enables decision-makers to select the most appropriate technologies and strategies to address the problems. It is also proposed that the "we-they" environment between employees and management be addressed with firstly formulating a shared organisational vision and objectives. The numerous avenues for communication should be used to inform and gain input from employees at all levels. This will require an investment of resources and a genuine commitment from management to instil that shared vision at every level of the organisation. In addition, management should invest in team building exercises with employees. The abovementioned recommendations correspond to the change approaches "Education and Communication" and "Participation and Involvement" suggested by Kotter and Schlesinger (1979) and Robbins and Decenzo (2001) to deal with resistance to change.

The spin-off from good communication and participation is that it promotes job satisfaction. Another theme present in the findings of this study is that employees are not satisfied with the status quo. Therefore it is possible that employees are not performing at their optimum. Thus, management is presented with a great opportunity and challenge to capitalise on the untapped potential of employees in order to meet organisational goals such as improved productivity.

An important recommendation that management should consider is the creation of an organisation development team. Organisation development (OD) facilitates planned, long-term company-wide change, essentially focusing on changing an organisation's culture (Robbins and Decenzo, 2001). Thus given today's intensely competitive and continuously changing business environment, an OD team or department may be considered a long-term investment. A fundamental task of OD is to foster an organisational environment of communication and trust, which is needed in the case of Hulett Aluminium. However, success of OD relies on employee participation. Common techniques available to OD include survey feedback, process consultation, team building and intergroup development (cooperation between teams).

In this study, the technology characteristics relative advantage, complexity and trialability were found to be very important factors for both change levels i.e. general employees and HR employees. Thus, they should form an important consideration for change agents when attempting to introduce the HRIS technology. Although compatibility was also cited, it is not easily modifiable (except for communication of the need for the change) and as such is not part of our focus. Rogers (1995) emphasised that users' perceived attributes of an innovation determine the rate of its adoption. Thus, individual's responsible for the selection of technology and related tools should develop and ensure that the HRIS offers a high degree of relative advantage and simplicity/user-friendliness from the end-users' perspectives (i.e. HR employee and general employee viewpoints). It must be noted that this can only be accomplished through inviting employee participation and input. The researcher acknowledges that technologies like the HRIS are generally not

custom designed and thus individuals responsible for technology selection have limited input, however these findings hold crucial value to designers of such technology.

Change agents should note that relative advantage was the most important technology characteristic for both HR and general employees and as such forms the biggest selling point of the HRIS change. Once again, this needs to be communicated to employees. A good method of explaining the benefits of a technology is through observation as suggested by Rogers' (1995) variable observability. Therefore, it is recommended that change agents investigate the possibility of having technology vendors demonstrate their product to employees through small sessions held on-site. In addition, change agents should bear in mind that making promises they cannot keep may result in lack of credibility i.e. all relative advantages promised must be deliverable.

Trialability proved to be an important vehicle through which employees believed they could become familiar with the HRIS. Employees indicated that trial of the technology would ease the uncertainty that the technology would introduce. Employees also view trial as an opportunity to participate in the change. Thus, change agents should consider the possibility of approaching different vendors for trial of their products. It is noted that technologies such as the HRIS are expensive and thus, trial of a complete system is not feasible. However, it may be possible to accommodate trial of the product among a few pre-selected employees. Given that the level of interaction with the HRIS increases with change level, trial among HR employees is considered more valuable.

Crucial support structures that change agents' need to consider are training and technical support. Owing to the HRIS technology being new and unfamiliar, HR employees considered training as necessary. It was also considered important because of the level of interaction HR employees will have with the technology. HR employees indicated that the best type of training for them to learn the system would be a practical training course.

However, management should heed Howard's (1986) warning that short-term, high intensity training programs are ineffective.

Another vital factor that change agents need to consider is technical support of the HRIS. HR employees perceive prompt technical support as crucial to them adopting a technology. To assist change agents in selecting a type of technical support, it is important to note HR employees in this study were in favour of on-site support for major technical issues and e-mail support for minor queries. Change agents should also note that HR employees did not welcome the call-centre option of technical support. Therefore, given the above support finding it is recommended that change agents revise the original technological support vision of a support hotline.

With respect to support for general employees, change agents should provide training to ease anxiety and concerns among employees with low levels of computer technology experience. Change agents should include the provision of training in their communication of the change, as it will help ease concerns of employees with little computer experience from first knowledge of the change. This may then result in smoother acceptance of follow-up communication or invite interest. It is recommended that a few training options be provided to accommodate employees with different levels of computer experience. That is, employees with low levels of computer experience believe that individual training sessions may be warranted because they may require more help. At the other extreme some employees believe that their use of the HRIS technology is simple and need only warrant a brief training session and manual.

Another technological feature that the HRIS must possess is security. Although a norm in HRIS and similar technologies, change agents must ensure that system security is a high priority in deciding on a technology. This factor was emphasised by HR employees. Change agents should also contemplate a respondent's suggestion that a redundant

system be installed to ensure greater system reliability, so as not to find the company wanting in the event of a system crash.

The interesting finding with respect to knowledge of the change context raising more questions emphasises the importance employees place on knowing about issues that affect them, especially directly. This finding conveys to management the importance of communicating to employees' issues affecting them. It must be noted that knowledge of the context did not raise concerns among employees as such, but questions intended for clarity and understanding. Thus, the lack of knowledge of the change context has the potential to create uncertainty and, lack of understanding around the vision and need for change.

The results about HR employees displaying internalisation and identification levels of social influence communicates to change agents that they are likely to be committed and enthusiastic in their use of the HRIS. More importantly, HR employees indicated low levels of compliance implying that change agents would not need to provide incentives to use the HRIS. However, the fact that some respondents did not know what the values of the company were, again illustrates the poor communication within the organisation. Change agents should heed that the results of the identification level was high among HR respondents, which may suggest that social influence, by significant others in their work environment, plays a more significant role in their decision to use the HRIS than they actually admitted. Therefore, change agents should identify the influential members in groups and get them to buy into the change first. Once the influential members of the group have bought into the change, it will be easier to get the rest of the group members to come onboard.

Although the results of the current study did not explicitly identify time availability as an important inhibitor to the HRIS, change agents should not overlook it. The reason being that relative advantage mediated its importance and that most respondents cited

pressurised working environments. Thus, employees should be permitted time to learn and familiarise themselves with the HRIS. This will also assist in decreasing their anxiety and uncertainty with the technology.

The shift in norms, values, beliefs and behaviours brought about by change modifies individuals' attitudes towards the change. On the positive side, change may be seen as an opportunity, innovation and growth. On the other hand, change can also be seen as akin to instability, upheaval, unpredictability, threat and disorientation. With respect to the present study, the researcher believes that respondents perceive the proposed HRIS change as positive. The work represented in this study is but a snapshot taken through a very small window. However, the organisational concerns, such as poor communication and lack of employee participation seem to be true concerns owing to them being present in both samples. In addition, these issues span employee service to the company i.e. it is cited as a problem by both recent employees and those that have been with the company for more than 20 years. For this reason they should be management's main priority.

## Recommendations for Future Research

It must be noted that this study applied to a specific technology within a specific context, however the findings of this study concur with those of various other studies in various contexts and as such possess some attributes of generalisation. This study was confined to the adaptive and high-adaptive change levels. As a result some technology resistance factors may have been dormant. Thus, a possible future area of research would be to apply this study's methodology to higher change levels and witness the effect on the resistance variables.

Owing to time constraints, this study could not satisfy Gould's (1981) (in Malato, 2001) suggestion of using data collected at several points in time. Therefore, it is recommended that to improve the current study, researchers collect data over time. In addition, this study was conducted with respect to the HRIS technology being in the conceptual stage. Thus, it would be interesting to investigate the change in resistance or enhancement

factors of the technology once it is in actual use, since the role of these factors vary with the technology's life cycle (Ram, 1987).

Also, although the qualitative instruments and interviewing techniques used in this study were developed through intense review of literature, they are not a substitute for experience. Thus, the use of professional researchers may yield more insightful findings. Owing to the fact that individuals of the general employee sample frame were not available, the researcher did not have access to all individuals with lower computer attitude scores. Therefore, the current study can be improved by interviewing more participants with lower CAS scores. Finally, quantitative studies designed to describe employees experiences will also help bring relevance to and help us better understand the technology resistance process.

The bodies of literature that were examined for this review and the research framework that emerged allows researchers and change agents to understand the role individual characteristics, technological characteristics, propagation characteristics and external factors have in employees' perceived resistance to adoption of the proposed HRIS technology. This study's findings have implications for reducing resistance to adopt and use the HRIS technology in Hulett Aluminium, but also for resistance to technology adoption in general. The results of this study provides a useful tool for managers to assess the likelihood of success for new technology introductions and helps them understand the drivers of acceptance in order to proactively design interventions such as training, targeted at populations of users that may be less inclined to adopt and use new systems.

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## Appendix A: CAS Cover Letter and Instrument

# *Hulett Aluminium (Pty) Ltd.*

### *A division of the Tongaat-Hulett Group ™*

*Dear Participant:*

Congratulations! You have been selected to participate in a "Computer Attitude" survey. The purpose of this survey is:

➢ To discover employees' attitudes towards computer technology in order to identify factors for improvement that will allow the organisation to plan more effective training programs.

➢ To gain insight as to the level of computer knowledge within the company.

Providing us with this background information will enable us to better serve employee needs as they actually exist regarding technology training.

Please complete the attached short and simple questionnaire and return it via the internal mailing system to **Avin Bhimsen** before **18 October 2004**. *Note:* Write "Survey Participant" as sender instead of your name. Participation is voluntary and all responses are confidential. Thank you in advance for accommodating this questionnaire within your busy schedule. I am extremely interested in your response and believe that this study will prove useful to improving Hulett's training initiatives for its valued employees. Should you have any areas of concern or further questions that were not addressed please do not hesitate to contact us.

Sincerely

**Vishal Ramnarian**

Extension: 6871

Email: Vishal.Ramnarian@Hulamin.co.za

*Instructions*

Please complete the questionnaire below. This questionnaire comprises two sections, namely: A forty question Computer Attitude Survey and a Background Information section. Completed questionnaires should be internally mailed to **Avin Bhimsen**, before **18 October 2004**.

**Section 1: The Computer Questionnaire**

Read each statement carefully and circle the number that best describes how you feel about that statement. The rating scale is as follows:

| | | |
|---|---|---|
| 1 = Strongly Disagree (SD) | 2 = Disagree (D) | 3 = Undecided (U) |
| 4 = Agree (A) | 5 = Strongly Agree (SA) | |

IMPORTANT: Answer each question with a pen as shown below.

| | |
|---|---|
| Circle answers as follows (if rating 4 was selected): | 1   2   3   ④   5 |

*Rating scale*: 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree

| | | |
|---|---|---|
| 1. | Computers do not scare me at all. | 1  2  3  4  5 |
| 2. | I'm no good with computers. | 1  2  3  4  5 |
| 3. | I would like working with computers. | 1  2  3  4  5 |
| 4. | I will use computers for many things in my life. | 1  2  3  4  5 |
| 5. | Working with a computer would make me very nervous. | 1  2  3  4  5 |
| 6. | Generally I would feel OK about trying a new problem on the computer. | 1  2  3  4  5 |
| 7. | The challenge of solving problems with computers does not appeal to me. | 1  2  3  4  5 |
| 8. | Learning about computers is a waste of time. | 1  2  3  4  5 |
| 9. | I do not feel threatened when others talk about computers. | 1  2  3  4  5 |
| 10. | I don't think I would do advanced computer work. | 1  2  3  4  5 |
| 11. | I think working with computers would be fun and stimulating. | 1  2  3  4  5 |

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| **Rating scale**: 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree | | | | | | |
|---|---|---|---|---|---|---|
| 12. | Learning about computers is worthwhile. | 1 | 2 | 3 | 4 | 5 |
| 13. | I feel aggressive and angry toward computers. | 1 | 2 | 3 | 4 | 5 |
| 14. | I am sure I could use computers in my work. | 1 | 2 | 3 | 4 | 5 |
| 15. | Solving computer problems does not appeal to me. | 1 | 2 | 3 | 4 | 5 |
| 16. | I'll need to know computers very well for my future work. | 1 | 2 | 3 | 4 | 5 |
| 17. | It wouldn't bother me to take computer courses. | 1 | 2 | 3 | 4 | 5 |
| 18. | I'm not the type to do well with computers. | 1 | 2 | 3 | 4 | 5 |
| 19. | When there is a problem with a computer that I can't immediately solve, I would stick with it until I have the answer. | 1 | 2 | 3 | 4 | 5 |
| 20. | I expect to have little use for computers in my daily life. | 1 | 2 | 3 | 4 | 5 |
| 21. | Computers make me feel uncomfortable. | 1 | 2 | 3 | 4 | 5 |
| 22. | I am sure I could learn a computer language. | 1 | 2 | 3 | 4 | 5 |
| 23. | I don't understand how some people can spend so much time working with computers and seem to enjoy it. | 1 | 2 | 3 | 4 | 5 |
| 24. | I can't think of any way that I will use computers in my career. | 1 | 2 | 3 | 4 | 5 |
| 25. | I would feel at ease in a computer class. | 1 | 2 | 3 | 4 | 5 |
| 26. | I think using a computer would be very hard for me. | 1 | 2 | 3 | 4 | 5 |
| 27. | Once I start to work with the computer I find it hard to stop. | 1 | 2 | 3 | 4 | 5 |
| 28. | Knowing how to work with computers will increase my job possibilities/opportunities. | 1 | 2 | 3 | 4 | 5 |
| 29. | I get a sad feeling when I think of trying to use a computer. | 1 | 2 | 3 | 4 | 5 |
| 30. | I could get good results in computer courses. | 1 | 2 | 3 | 4 | 5 |
| 31. | I will do as little work with computers as possible. | 1 | 2 | 3 | 4 | 5 |
| 32. | Anything that a computer can be used for, I can do just as well some other way. | 1 | 2 | 3 | 4 | 5 |
| 33. | I would feel comfortable working with a computer. | 1 | 2 | 3 | 4 | 5 |
| 34. | I do not think I could handle a computer course. | 1 | 2 | 3 | 4 | 5 |

| Rating scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree | | | | | | |
|---|---|---|---|---|---|---|
| 35. | If a problem were left unsolved in a computer class, I would continue to think about it afterward. | 1 | 2 | 3 | 4 | 5 |
| 36. | It is important to me to do well in computer classes. | 1 | 2 | 3 | 4 | 5 |
| 37. | Computers make me feel uneasy and confused. | 1 | 2 | 3 | 4 | 5 |
| 38. | I have a lot of self-confidence when it comes to working with computers. | 1 | 2 | 3 | 4 | 5 |
| 39. | I don't enjoy/like talking about computers with people. | 1 | 2 | 3 | 4 | 5 |
| 40. | Working with computers will not be important to me in my life's work. | 1 | 2 | 3 | 4 | 5 |

## Section 2: Background Information

Please complete the following background questions.

41. How often do you use a computer either at home, work or elsewhere? (Place a tick next to one of the choices given)

| Daily | | Monthly | |
|---|---|---|---|
| Weekly | | Yearly | |
| Never | | | |

42. Do you have a computer at home?

| Yes | | No | |
|---|---|---|---|

43. Gender

| Male | | Female | |
|---|---|---|---|

44. Age: _____

45. Education: Please indicate your highest level of education from the choices given.

| Primary School or lower | | University Degree | |
|---|---|---|---|
| High School or equivalent | | University Postgraduate Degree | |
| Technikon Diploma or equivalent | | Other | |

## Thank You!

## Appendix B: General Employee Context Document

Owing to the company's expansion the Services department saw the need for a new Human Resources Information System, because the current one is slow, costly and inefficient. To solve this problem, the company is thinking of moving HR processes and procedures into an electronic format (on computer). The new system is expected to increase the timeliness and accuracy of employee information, help in improving people management, provide management and employees with direct and easy access to information and, obtain cost savings.

What does this mean for you?

> ➢ It means that you will now apply for leave and study loans through a computer. You will have a username (like an ID number) and password, and be able to access the system through base station computers i.e. there will be computers at various places/departments for you to do this. The leave and other standard forms will all look the same just that now you will need to fill it in on a computer.

Advantages for you are:

> ➢ Self-service: you can apply anytime. You can view all information about your benefits anytime, for example, checking on the true value of pension funds, requesting time off, applying for study loans and study leave.

> ➢ You can logon to a computer – from anywhere (even an information kiosk) - and see when you qualify for a doctor's exam or what their annual limit for contact lenses is.

> ➢ Also you can manage your company benefits such as leave, travel and skills development.

> ➢ Current information on benefits, such as, pension-find performance.

> ➢ Access to current HR and other service procedures, for example, medical-aid procedures.

➤ Faster application submission and approval.

You will receive conformation whether your leave or other applications have been approved within a 24-hour period. Each employee's request will be automatically sent to his or her respective supervisor/manager for approval. Employees will then receive replies through messages on the system from their manager/supervisor as to whether his/her request was approved. Reasons for not approving leave will be given.

## Appendix C: HR Employee Context Document

The role of HR has changed owing to the fast changing business world. HR is now expected to work better, faster and cheaper, and most importantly make time for strategic planning. Owing to the company's intense expansion, the Services department identified the need for a new Integrated Human Resources Information System, because the current one is slow, costly and inefficient.

To solve this problem, the company is thinking of moving HR processes and procedures into an electronic format. The new system is expected to increase the timeliness and accuracy of employee data, assist in streamlining people management processes, provide management and employees with direct and easy access to information and, obtain significant cost benefit. In addition this Human Resource Information System (HRIS) will be equipped with business tools such as trend analysis (for example graphs of how employees use their benefits and the flagging of sick leave abuse), database manipulation (i.e. editing employee records and HR procedures), remuneration planning (devising various employee packages) and other HR related applications.

What does this mean for you?

> Less "paper pushing" i.e. administrative tasks taking up valuable time may now be spent on other job critical tasks. Employees will be able to apply for leave and study loans by themselves.

> Instant access to real-time (i.e. up-to-date) business and employee records and procedures.

> More control through employee trend analysis and flagging of company benefit "abuse" e.g. abusing of sick leave.

> Controlled modification/changes to HR procedures (i.e. only one person can make a change to a specific item at a given time), employee records and other database sensitive data, therefore ensuring that everyone uses the same reference information.

> Improved quality of HR planning activities through the support of business tools such as "What-If" analysis and other related modelling capability, such as remuneration planning tools.

> Reduced HR service process and costs due to a reduction in duplicated data, data entry and data verification processes.

You will have a username (like an ID number) and password to access the system. The system will provide HR employees and managers with information and appropriate tools to manage the workforce strategically aligning its people management practices with the 'best in class'.

Note that employees will receive conformation whether their leave or other applications have been approved within a 24-hour period. Each employee's request will be automatically routed to his or her respective supervisor/manager/responsible person for approval. Employees will then receive replies through messages on the system from their manager/supervisor as to whether his/her request is approved. Reasons for not approving leave will be given.

## Appendix D: General Employee Interview Script

Explain confidentiality and voluntary participation

1. Job title: What is your position?

2. Job description:

|  |
|  |
|  |

3. How long have you been in your current job?

4. What do you like about your job?

5. What don't you like about your job?

6.  How would you describe your working environment?

| Stressful |  |
|---|---|
| Pressurised (busy but manageable) |  |
| No autonomy/freedom |  |
| Okay/satisfactory |  |
| Flexible |  |
| Relaxed |  |
| Other |  |

7. What were you thinking during answering the computer survey?

8. Did the survey raise any concerns?

9. What do you think about the way you now put in leave and query about your pension and medical aid?

| Okay |  |
|---|---|
| Slow process |  |
| Wastes work time |  |
| Inconvenient |  |
| Information gets lost |  |
| Other |  |

**(Note: Issue the HRIS technology context document at this stage)**

10. What about this new system worries you?

11. What features would this system need to make you want to use it?

12. Will you use the system because your co-workers or friends think you should? (How do you think your co-workers will react to the proposed system?)

13. Why would you want to use this system? (What do you like about this new system?)

| Saves time | |
| Convenient | |
| Data integrity/safety | |
| Fewer mistakes | |
| Other | |

14. Do you think you will be able to use this system well?

(On a scale of 1-5 with 1=Strongly Disagree 3=Neutral and 5=Strongly Agree)

| Yes | No (Why not?) |
| --- | --- |
| | |

15. Does using this system make you uncomfortable in any way?

(On a scale of 1-5 with 1=Strongly Disagree 3=Neutral and 5=Strongly Agree)

| Yes (Why?) | No |
| --- | --- |
| | |

16. Do you think it would be better if you could experiment/play around with the system beforehand?

17. How do feel about learning the new system?

| Excited | |
| Nervous | |
| Afraid | |
| No time | |
| Other | |

18. What will be the best way for you to learn the HRIS system?

| | |
|---|---|
| Training course | |
| Individual training | |
| Online help | |
| Manual | |
| Other | |

19. What do you believe is important for the company to do if it wants to make a change like this?

20. Is there anything else that you would like to ask or express?

*Summarise and check that respondents responses are what they intended conveying. (For example: Am I correct in saying that the main factors that determine whether you adopt/use a technology are...?)*

## Appendix E: HR Employee Interview Script

Explain confidentiality and voluntary participation

1. Job title: What is your position?

2. Job description:

| |
|---|
| |

3. How long have you been in your current job?

4. What are your likes about your job?

5. What are your dislikes about your job?

6. How would you describe your working environment?

| | |
|---|---|
| Stressful | |
| No autonomy or freedom | |
| Okay/satisfactory | |
| Flexible | |
| Relaxed | |
| Pressurised | |
| Other | |

7. Are you confident in using computers?

8. Do you have any concerns about computers?

| Concerns | Reason |
|---|---|
| Fear | |
| Anxiety (nervous) | |
| Not clear | |
| No time | |
| Other | |

9. What do you think about the current system you use to perform your job?

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**(Note: Issue the HRIS technology context document at this stage)**

10. What about this new system causes you concern?

11. What attributes will this system need to make you want to use it?

12. Based on your experiences with other companies, where does Hulett stand in terms of using technology to help employees to their work better?

13. Will you use the system because your co-workers or friends think you should? (How do you think your co-workers will react to the proposed system?)

14. How will this new system affect your relationship with co-workers and employees?

15. What do you believe is important for the company to do if it wants to introduce a change like this?

16. What are the benefits of this new system to you? (Why would you want to use this system?)

17. Do you feel confident in using such a system?

(On a scale of 1-5 with 1=Strongly Disagree 3=Neutral and 5=Strongly Agree)

| Yes | No (Why not?) |
|-----|---------------|
|     |               |

18. Does using such a system make you uncomfortable in any way?

(On a scale of 1-5 with 1=Strongly Disagree 3=Neutral and 5=Strongly Agree)

| Yes (Why?) | No |
|------------|-----|
|            |     |

19. Would you be more comfortable if you could experiment with the system beforehand?

20. How do feel about learning the new system?

| Excited |  |
|---------|--|
| Nervous |  |

| Afraid | |
|--------|--|
| No time | |
| Other | |

21. What will be the best way to learn the system?

22. What will be the best method of technical support?

23. Is there anything else that you would like to ask or express?

*Summarise and check that respondents responses are what they intended conveying.* (For example: Am I correct in saying that the main factors that determine whether you adopt/use a technology are...?)

## Social Influence Instrument

On a scale of 1 to 5 with 5 = Strongly Agree, how would you rate the following statements.

| Rating scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree | | | | | | |
|---|---|---|---|---|---|---|
| 1. | The HRIS is inline with the company's values. | 1 | 2 | 3 | 4 | 5 |
| 2. | I think I will be proud about using the HRIS technology. | 1 | 2 | 3 | 4 | 5 |
| 3. | I would like using the HRIS because my values and that of the company are similar. | 1 | 2 | 3 | 4 | 5 |
| 4. | I see no reason to spend extra effort in using the HRIS, unless I am rewarded. | 1 | 2 | 3 | 4 | 5 |
| 5. | I will talk up the use of the HRIS to my friends/colleagues as a great use. | 1 | 2 | 3 | 4 | 5 |
| 6. | I think how hard I work on using the HRIS will be directly linked to how much I am rewarded. | 1 | 2 | 3 | 4 | 5 |
| 7. | What the use of the HRIS stands for is important for me. | 1 | 2 | 3 | 4 | 5 |
| 8. | I feel a sense of personal ownership about the use of HRIS technology. | 1 | 2 | 3 | 4 | 5 |
| 9. | My private views about using computers are different than those I talk about in public. | 1 | 2 | 3 | 4 | 5 |
| 10. | In order for me to get rewarded in my job, it is necessary to use computer technology. | 1 | 2 | 3 | 4 | 5 |