DEVELOPMENT AND VALIDATION OF A MEASURE THAT EXAMINES ATTITUDES TOWARDS e-HRM PRACTICES

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STATEMENT

I declare that “DEVELOPMENT AND VALIDATION OF A MEASURE THAT EXAMINES ATTITUDES TOWARDS e-HRM PRACTICES” is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references.

…….. ……..

SIGNATURE DATE

(MRS L SHANE)

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SUMMARY

The main objective of this research was to investigate, analyse and evaluate attitudes towards electronic human resource management (e-HRM) tools within a large South African financial institution. This was done by developing and validating an instrument to determine e-HRM tool usage, e-HRM tool preference as well as attitudes towards e-HRM.

Methodology: a total of 104 HR professionals and line managers completed the e-HRM attitudinal questionnaire. The sample demographics were obtained using analysis of the frequencies of respondents in each of the demographic categories as well as within the tool usage section and attitudinal measurement section. To ascertain the internal consistency of the attitudinal component of the e-HRM measurement instrument and the six attitudinal subscales, the Cronbach's alpha reliability coefficient was calculated for overall scale and corresponding subscales. Due to the low reliability obtained for three of the subscales, the structure of the e-HRM measurement instrument was assessed using exploratory factor analysis. Differences between groups with regard to preference for tool usage were assessed, using Pearson's Chi-Square tests for both the occupational and the demographic characteristics of respondents. Finally, to explore whether there were any significant differences for biographical and occupational demographics and attitude on the measurement instruments, an independent samples t-test was conducted and one-way analysis of variance (ANOVA) was used.

The main finding of the study was that users of e-HRM tools had significantly more positive attitudes towards e-HRM tools than non-users.

Keywords: Electronic human resource management; attitude; information technology; operational HRM; relational HRM; transformational HRM; human resource information systems (HRIS).

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CHAPTER 1 OVERVIEW OF THE RESEARCH

This dissertation focuses on the concept of electronic human resource management (e-HRM) and the attitudes human resource (HR) professionals and line managers in the banking industry have towards it. The aim of this chapter is to provide the background and motivation for this research, discuss the problem statement, specify the aims and explain the research model. The paradigm perspectives of the research will be given. Thereafter, the research design and methodology will be presented and the chapter layout will be given. Finally, a summary of the subsequent chapter and the chapter framework for the dissertation will be outlined.

1.1 BACKGROUND AND MOTIVATION

Organisations and people in the twenty first century face many challenges and opportunities that evolve from increasing complexity and constant changes facing the world of work. These challenges include the advent of technological advancement, globalisation, telecommuting, e-commerce, economic restructuring and new employment patterns.

Global and national changes are impacting the South African business environment and subsequently influence how human resources are managed. Human capital, according to Walker (2001), is the last remaining competitive advantage in business. In order to gain a competitive advantage, the way in which these human resources are managed has needed to change. Implicit in this change, the HR professional's role is expanding. Responsibilities have evolved from rudimentary personnel activities and policy execution to an operational role in giving strategic direction within the organisation (Jones & Arnold, 2003). One of the major changes in the world of work is near constant technological advancement, with a definite move towards the use of technologically sophisticated ways of getting things done. This is also prevalent in the way that human resource management practices both within and outside the organisation are being conducted. New, dynamic ways of managing HR are being seen everyday. The world

today is fast paced and information intensive. People want and need information at their finger tips. People are generally very optimistic when it comes to technological possibilities for human resource management.

It is felt by Ruël, Bondarouk and Looise (2004) that, in principle, all HR functions can be supported by information technology. The term *E-HRM* is a fairly new name for information technology-supported human resource management (Ruël et al., 2004). According to Biesalski (2003, p. 1), E-HRM "is a web-based tool to automate and support HR processes". Ruël et al. (2004) define e-HRM as a way of putting into operation HR strategies, policies, and procedures within the organisation, through an intentional and directed support of and/or with the full use of web technology-based channels. Organisations need to embrace the e-HRM revolution which relies on cutting-edge information technology, ranging from Internet-enabled human resources information systems (HRIS) to corporate intranets and portals.

The entrance of new competitors into the financial services arena during the past few years in South Africa has had a profound effect on both the business of banking and the talent required to run it. E-HRM is seen as a facilitative tool that can be used to manage prospective and current talent to ensure that the appropriate skills are attracted into the business at the right time and that these skills are retained. Ultimately, the ability to manage employees will influence bottom-line profits. The Cedar workforce technologies survey (2004) reports on market activity and the state of organisations in applying technology to deliver HR services to the workforce. The findings implied that HR technology applications directly impact the transformation of the HR function and that these applications improve workplace productivity, profitability and revenue.

The evolution of the human resource function from paper-based to web-based is an inevitable reality. With this in mind, there is a need for much more research on the topic, especially within the South African context where the adoption of these technologies is in its infancy. It is hoped that through this research, more information will come to light

regarding the effects of e-HRM on HR professionals and line managers as well as industrial and organisational (IO) psychologists.

Published research on e-HRM is scarce in general. Academic research into e-HRM began fairly late and, to a degree, is still trying to catch up with practice (Ruël, Bondarouk & Van der Velde, 2007). The majority of publications and research pertain to the practical implementation of the technical e-HRM systems used to support the human resource function. E-HRM has however been widely reported on by consultancy firms and professional human resource organisations such as Watson Wyatt (2002). This point is acknowledged by Strohmeier (2007, p. 34), who suggests that the current body of knowledge concerning e-HRM only concentrates on several central points. The evidence is sufficient to suggest that e-HRM is "an innovative, lasting and substantial development in HRM" that needs to be further addressed as a real and enduring phenomenon (Strohmeier, 2007, p. 34).

In terms of the benefits to the IO psychology fraternity, it is anticipated that this research could be the impetus for organisations to implement e-HRM systems to improve efficiency and effectiveness of current HR practices.

With new and innovative technological advances, the positive aspects are highlighted. The literature suggests that there are many positive features associated with e-HRM (Bell, Lee & Yeung, 2006; Strohmeier, 2007; Wright & Dyer, 2000; Zhang & Wang, 2006). E-HRM is a resource saving tool in that, if implemented and used properly, will save costs, time and money by cutting down on time taken for interviews and testing job applicants. E-HRM supports many of the HR administration duties and is a suitable tool for routine tasks. It can improve quality of HR information as it is more up to date. It allows for decentralisation and standardisation of HR tasks across global boundaries. From an employee's perspective, it provides access to more information regarding their own growth and development and control of their own careers. Line managers also will readily have access to required employee information for decision-making. It reduces

human bias and maintains anonymity of staff in evaluation and giving feedback. Finally, e-HRM allows HR to spend more time on strategic decisions and problem solving.

On the negative side, e-HRM can alienate staff members who may require more personal support. It may also alienate managers from their subordinates, as there is no longer as great a need for managers to interact with their staff. Another relevant disadvantage is that e-HRM systems are subject to corruption and data losses which would be devastating for an organisation. In this respect, there are technical developments which can mitigate the risks.

1.1.1 Current trends in e-HRM

According to Watson Wyatt's (2002) fourth annual survey of HR technology issues, the transition from paper-based to web-based HR transactions began over a decade ago. Centred on rapidly developing web technologies, current web-based HR practice encompasses a fully integrated network of HR-related data, tools and transactions. Diverse empirical studies carried out by consultancy firms have given evidence that e-HRM is in widespread use in North America and Europe (Strohmeier, 1998).

Watson Wyatt's (2002) survey of HR technology issues also revealed that a wide variety of HR and payroll systems are being used today. According to the results of the study, web technology is the predominant method for delivering HR-related services to employees and managers, and offers significant opportunities to improve communication, knowledge sharing and HR delivery systems.

HR service delivery has emerged as a critical factor in driving HR effectiveness. In the Towers Perrin (2006, p. 2) annual HR service delivery survey, key trends in e-HRM emerged. The survey revealed that the greatest growth in HR technology is in the area of talent management. This is attributed to the fact that "talent management is front and centre on the organisational leadership agenda today". This is true in most industries, including the banking sector.

The results of the SHRM 2005 HR Technology Survey Report (cited in Weatherly, 2005) show that on average more than 50% of organisations of all sizes are using some form of HR technology system in the United States. This is beneficial for organisations that are considering e-HRM in South Africa, as there are opportunities to see how systems actually work.

There are many ways in which employers utilise technology to enhance and support the HR function. Technology is used for recruitment, career planning, performance management, determination of rewards and recognition, training and development, and employee relations (Andors, 2005).

It would seem that global multinational corporations experience more of the benefit gained from implementing E-HRM in terms of reduction of costs and downsizing than less developed global organisations (Dolan & Acosta-Flamma, 2005).

According to Jaquenoud (2005), e-HRM supports HR measurement in recruitment, people administration, competence development, training administration, career and succession planning and performance management. Jones and Arnold (2003) mention further applications of e-HRM such as virtual career centres, integrated personnel assessments, e-learning platforms, web-based surveys, and on-line performance appraisals.

All of these e-HRM applications and others allow for around-the-clock access and processing of human resource information. Furthermore, important updated HR information is produced from these applications for real-time analysis. Sources of HR information include assessment results, background data, training history, competency profiles, and performance evaluations (Jaquenoud, 2005).

1.2 PROBLEM STATEMENT

In Strohmeier's (2007) research, which reviews studies that have been conducted within the electronic human resource management field, 57 studies relating to e-HRM could be identified. The majority of the studies found emanated from human resource management journals, followed by organisational and industrial psychology journals, (management) information systems and general management journals. It is clear that all studies reviewed in this article originated internationally which indicates that there is a gap in research from a South African perspective. Within the South African literature, very little reference has been made to electronic human resources management. The only studies that related to the topic were found in information technology-related journals. One such reference is made by Stegmann (2003) from Oracle SA. It is from this point of departure that it was decided to conduct a research study to determine the effects e-HRM has on human resource professionals and line management and their subsequent attitudes towards e-HRM.

It became evident that there were no questionnaires or surveys in existence that examined attitudes towards e-HRM. As such, it was decided by the researcher that in order to address issues such as attitude toward e-HRM, it would be appropriate to develop a questionnaire for the purpose of this research.

It has been shown in the literature that there are as many benefits as pitfalls to implementing electronic human resource management applications (Lengnick-Hall & Moritz, 2003; Panayotopoulou, Vakola & Galanaki, 2007; Strohmeier, 2007; Wright & Dyer, 2000). South Africa is still in its first phase of adopting these tools. It is imperative that international evidence of the success, failure and learning from the use of e-HRM is incorporated into the execution of these systems in South Africa. South African organisations have the advantage of learning from the trials and errors of international companies.

Against this background, it is apparent that HR practices are changing as information technology applications are becoming more readily available for human resource management. A clear understanding of how the use of e-HRM tools within organisations affects the work of HR professionals and line management is needed to establish the attitudes of these individuals towards the tools – as they are seen as the primary users. This is one of the primary reasons for this research. Whilst there is much research regarding the implementation, usage and effectiveness of e-HRM (Cedar, 2004; Ruël & Bondarouk, 2006; Zhang & Wang, 2006), there are few studies that investigate attitudes towards e-HRM tools in terms of the impacts it may have on the work of HR professionals and line management. Two studies were identified that dealt specifically with attitude toward HR information technology, namely those conducted by Kinnie and Arthurs (1996) and later by Voerman and Van Veldhoven (2006).

A major intention of this research study is therefore to contribute to the broader research community by generating new knowledge and enhancing existing knowledge within the field of IO psychology, as well as to develop and validate a questionnaire that could assess attitudes towards e-HRM. Furthermore, the study addresses this topic from a South African work context and viewpoint by focusing on human resource professionals within a South African bank.

Another intention of this research concerns the sharing of learning about e-HRM. Organisations can use this research in order to raise awareness to possible stumbling blocks, impacts and consequences that attitudes towards e-HRM may cause.

1.2.1 General Research Question

The general research question that requires further investigation is as follows:

Does the utilisation of e-HRM tools affect attitudes towards these tools?

1.2.1.1 Specific Research Questions

Arising out of the literature review, the following specific research questions will be addressed in this research project:

(1) How is the construct of e-HRM conceptualised and explained in the literature?
(2) What is the historical development of e-HRM?
(3) How is e-HRM related to development in HRM?
(4) How does e-HRM link to socio-technical systems theory?
(5) How is e-HRM used for various HR practices?
(6) What are the impacts of e-HRM on the work of HR professionals and line managers?
(7) What are the implications of e-HRM for IO psychologists?

In terms of the empirical study, the following specific research questions will be addressed in this research:

(1) Do HR professionals utilise e-HRM tools more than line managers?
(2) Is there a difference in the HR practices of HR professionals and line managers?
(3) Is there a difference in the attitude towards e-HRM between HR professionals and line managers?
(4) What recommendations can be formulated based on the findings of this research?

1.2.2 Aims of the research

Given the specific problem that should be investigated, the aims of this research project are listed below.

1.2.2.1 General Aim

The general aim of this research is to investigate, analyse and evaluate attitudes towards e-HRM tools by developing and validating an attitude measure to do so. This was achieved by addressing the specific aims of the research that are presented below.

1.2.2.2 Specific Aims

In terms of the literature study, the specific aims of this research are to:

(1) Conceptualise e-HRM
(2) Investigate the history of the development of e-HRM
(3) Examine how e-HRM relates to the development of HRM
(4) Link e-HRM to socio-technical systems theory
(5) Review the various uses of e-HRM for HR practices
(6) Investigate the impacts or effects of e-HRM on the work of HR professionals and line managers
(7) Review the implications of e-HRM for IO psychologists

In terms of the empirical study, the specific aims of this research are to:

(1) Develop and validate an instrument to measure attitude toward e-HRM
(2) Determine whether HR professionals utilise e-HRM tools more than line managers
(3) Establish whether or not there is a difference in the HR practices of HR professionals and line managers
(4) Ascertain whether or not there is a difference in the attitude towards e-HRM between HR professionals and line managers
(5) Formulate recommendations and further research based on the findings of this research

1.3 PARADIGM PERSPECTIVE: SOCIO-TECHNICAL SYSTEMS APPROACH

This research study will be conducted within the Organisational Psychology field as part of Industrial and Organisational Psychology. The applicable psychological paradigm is the socio-technical systems approach.

Trist and Bamforth (cited in Mitchell & Nault, 2003) were the pioneers of the socio-technical systems (STS) approach. The tenet of the discussion centred on the fact that the technical component and the social component of work could not been seen as separate, but rather had to be seen in terms of both of these dimensions. From this study, the term *socio-technical system* was created to describe a method of viewing organisations by highlighting the interrelatedness of the social and technological dimensions of work.

Much of the theory behind the STS approach is derived from open systems theory (Mitchell & Nault, 2003). The systems description provides a framework for understanding the structural aspects of an organisational system (Cilliers, 2003). Systems theory allows for a means of studying the properties of organisations in relation not only to their components, but also to the ways in which the components of the organisation interact with each other and with their environment (Kirk, 1995). The term *system* implies that the organisation and its components are interrelated and interdependent. Changes and development within one component of the system will have an affect on other components. Cilliers (2003) includes design, division of labour, levels of authority and reporting relationships, the nature of work tasks, processes and activities, organisational mission and primary tasks as well as the nature and patterning of the organisation's task, sentient boundaries and the transactions across them, as some of the system dimensions or components. The expression "open" signifies that the dimensions of the organisation must be designed with reference to evolving environmental demands. This is reinforced by Muchinsky (2000), who views the

relationship between the organisation and its environment as interdependent. If the effect of one systems component on another is kept in the foreground, the ultimate aim is to ensure that all subsystems are working in harmony.

The goal of integration of social and technical aspects of work is proposed in the STS approach. The social necessity of people doing work is incorporated into the technical requirements needed to keep the work processes practical with regard to their environments (Mitchell & Nault, 2003). Adler and Docherty (1998) suggest that the central goal of the system in relation to its environment is to create value for its stakeholders, and that, through the application of e-HRM, this can be achieved by allowing quick and easy access to HR information in an efficient and cost-effective manner.

The selection of an STS approach for this particular research proposal is indicative of the topic that has been chosen. The investigation of e-HRM and the resultant effects on human resource professionals involve an interface between the social (people at work) and the technical (web-based technology used for HR functions).

The STS will be investigated further in the literature review.

1.4 RESEARCH DESIGN

According to Henn, Weinstein and Foard (2006, p. 46), the research design “essentially refers to the plan or the strategy of shaping the research”.

The chosen research design of this study comprises a quantitative design which translates constructs and concepts into operational definitions, and finally into numerical indices.

According to Mouton and Marais (1990, p. 33), “the aim of a research design in to plan and structure a given research project in such a manner that the eventual validity of the research findings is maximised”.

Ruane (2005, p. 12) states that quantitative research in the social sciences “document[s] social variation in terms of numerical categories and rel[ies] on statistics to summarise large amounts of data”. The quantitative research process is aimed at the creation of testable theories which are generalisable across situations (Amaratunga, Baldry, Sarshar & Newton, 2002). Quantitative studies look for distinctive characteristics, fundamental properties and pragmatic limitations, and generally measure “how much” or “how often” (Nau, cited in Amaratunga et al., 2002).

Using a quantitative research design allows for flexibility in the handling of data by allowing for “comparative analysis, statistical analyses, and repeatability of data collection in order to verify reliability” (Amaratunga et al., 2002).

1.4.1 Research variables

In order to understand the dynamics of the study, it is crucial to ascertain what the research variables are. The independent variable is defined as the variable that influences the dependent variable in either a positive or a negative way (Sekaran, 1992). For the purpose of this study, the independent variable is the use of e-HRM tools.

The dependent variable is defined as the variable of primary interest to the researcher. The researcher’s goal is to predict or explain the variability in the dependent variable (Sekaran, 1992). For the purpose of this study, the dependent variable is attitude toward e-HRM.

The objective of this study is to determine whether the use of e-HRM tools (independent variable) affects attitude towards e-HRM.

As e-HRM is a relatively new area of human resource management in South Africa, it was deemed appropriate to use a quantitative, exploratory research design. Structured questionnaires were used as the data collection method. For the purpose of this study, the units of analysis are individuals (HR professionals and line managers) and groups.

1.4.2 Validity and reliability

The terms *validity* and *reliability* are essential criteria for quality in quantitative research (Golafshani, 2003).

1.4.2.1 Validity

Validity is concerned with whether or not an instrument, or in this case, the questionnaire, measures what it purports to measure and must be attained.

Validity in terms of the literature review can be attained by ensuring that the literature used relates to the research in question.

In the empirical research, validity is ensured through the use of an appropriate questionnaire. Criterion-related validity, content validity and construct validity will be investigated in the development of the survey instrument.

1.4.2.2 Reliability

Reliability is concerned with the repeatability of a study. Internal consistency reliability will be looked at for this particular study as it is important to investigate how groups of items measure a specific concept (Litwin, 1995).

1.4.3 Unit of analysis

The units of analysis for the purpose of this study are individuals, including HR professionals and line managers from a South African bank. Groups as collectives of individuals also form part of the research, as the results will be based on findings of groups and not only individuals.

1.4.4 Type of study

1.4.4.1 Exploratory research

Exploratory research attempts to gain insight and understanding of a new or little researched phenomenon (Ruane, 2005). This research is exploratory in that the concepts of e-HRM and especially attitude towards e-HRM are fairly new within the South African context.

1.4.4.2 Descriptive Research

This study is descriptive in nature and involves an investigation of the attitudes of HR professionals and line management towards e-HRM. Descriptive research, according to Ruane (2005), aims to give a comprehensive depiction or description of a social phenomenon, setting, experience or group. Accuracy is key to this type of research and special focus is given to measurement and sampling. Descriptive research “seeks to find out what’s going on and who is involved, the size of the group and what the members look like” (Ruane, 2005, p. 12).

1.4.5 Method of study

The research method adopted includes both a literature review and an empirical investigation, the details of which are set out in the table and text below:

TABLE 1.1 RESEARCH METHOD

Phase / Step	Description
Phase 1	**Literature review**
Step 1	**E-HRM**
	The theoretical background, definition, history and related concepts of e-HRM are discussed.
Step 2	**Development of e-HRM**
Step 3	The various impacts and effects of e-HRM on human resource professionals are discussed.
Phase 2	**Empirical study**
Step 1	**Determination and description of the population and sample**
	A convenience sample was drawn from a population of human resource professionals and line managers who have an understanding of human resource management practices.
Step 2	**Data Collection – The measuring instrument**
	A questionnaire was developed and distributed to the sample group.
Step 3	**Formulation of research hypotheses**
Step 4	**Data Analysis**
	The statistical data analysis techniques are discussed.
Step 5	**Reporting and interpretation of empirical results**
Step 6	**Integration of the literature review and empirical research**
	The information from the literature and the empirical research results are integrated.
Step 7	**Conclusions of the research**
	The conclusions are related to the stated aims of the research study.
Step 8	**Limitations of the research**
	Limitations of the research are formulated with reference to the literature review and the empirical study.
Step 9	**Recommendations**
	The answer to the research question and the solution to the formulated problem are addressed, and future research needs are highlighted.

This study will be conducted through quantitative means. Quantitative data will be collected through the use of a structured questionnaire which will be administered to human resource professionals and line managers who utilise e-HRM tools within the scope of their jobs.

1.4.6 Research methodology

Research methodology refers to the theory behind the researcher's approach to a research problem and the method selected to solve it (Van Manen, 1990). Leedy (1993) contends that the nature of the data and the research problem determine the research design and the methods used to collect and analyse data.

1.4.7 Sample

Due to the relative newness of the topic of this study, convenience sampling was selected as sampling method. The adoption of e-HRM tools in South African organisations affects the availability of participants for the research. In convenience sampling, the researcher uses his or her judgment regarding the most common or typical characteristics of the population under investigation. The researcher selects only the participants who meet the criteria of what is considered typical of the population being studied (Morse & Field, 1996). The type of convenience sampling selected was homogeneous sampling. This type of sampling reduces variation and simplifies analysis. It was anticipated that the achievable sample size will be between 100 to 120 respondents. As the study is quantitative in nature, it is important that there are enough respondents for results to be statistically significant. The sample was sourced from a South African financial institution and included individuals who were familiar with human resource management processes. These respondents were chosen based on their existing exposure to e-HRM.

1.4.8 Data collection

Data collection involved the use of a structured questionnaire distributed to the selected sample of people. The questions in the instrument were pre-tested to eliminate ambiguity and problems with wording.

1.4.9 Data analysis

“Data analysis is the process of bringing order, structure, and interpretation to the mass of collected data” (Marshall & Rossman, 1999, p. 150).

According to Amaratunga et al. (2002), quantitative data analysis often involves statistical data analysis methods that deal with the examination of behavioural elements of performance. Researchers most commonly utilise methods such as chi-square analysis, correlation analysis, factor analysis and so on.

It is recommended that one must begin all data analysis, irrespective of the nature of data collected, with an examination of the raw data in order to become aware of patterns. This is done to discern any hypothetical relationships that may exist. The function of data analysis is to provide information about variables and to determine whether or not relationships exist between them (Amaratunga et al., 2002).

1.5 LIMITATIONS

One of the major limitations when collecting data through the use of structured questionnaires is that respondents are hesitant to complete such forms. It has been shown that even when a questionnaire’s completion is mandated by the organisation, response rates are still low. Another limitation is the lack of previous research in this field within a South African context, that is, there is no South African foundation point

from which to start. Furthermore, it may be difficult to get a large enough sample due to the relative infancy of the use of e-HRM within organisations.

1.6 CHAPTER DIVISION

The chapters will be presented in the following manner:

Chapter 2: Literature review

The first aim of this chapter is to conceptualise e-HRM by defining it and its components, to review the historical development of e-HRM and to review previous research. The second aim is to explore the stages of e-HRM development and the various effects of e-HRM on the work of human resource professionals and line managers from a socio-technical systems perspective. Finally, the implications of e-HRM for IO psychology will be highlighted.

Chapter 3: Empirical study

The purpose is to describe the empirical research. This is done by determining and describing the population and sample, and discussing the measuring instrument. The formulation of the research hypotheses, administration, data collection, data analysis and the statistical processes to be used are also reviewed.

Chapter 4: Research results

In this chapter, the research hypotheses will be tested and the research findings will be presented. The literature and empirical results will also be integrated.

Chapter 5: Conclusions, limitations and recommendations

In this chapter, conclusions will be drawn from the literature and the empirical study. Some limitations of the research will be addressed and recommendations will be made.

1.7 CHAPTER SUMMARY

In the context of the ever-changing world of work, globalisation and increasing technological advances, it is imperative for organisations to move toward a system of e-HRM or web-based human resource management. Current e-HRM practices are being explored in many organisations – both to support HR functions and as a fully automated HR system – but much more development and research are still required regarding people's attitude to this innovative technology.

In this chapter, the background and motivation for this research, the problem statement, research questions and research aims are discussed. The paradigm perspective of the research is given. The research design and methodology are briefly described, and the chapter layout is given.

CHAPTER 2 LITERATURE REVIEW

Chapter 2 corresponds with the first and second specific aims of the research, as laid out in chapter 1, namely to explore the concept of e-HRM by defining it and its components, to review the historical development of e-HRM and to review previous research. The second aim was to explore the stages of e-HRM development and the various effects of e-HRM on the work of human resource professionals and line managers from the socio-technical systems perspective.

2.1 DEFINITIONS AND BACKGROUND OF E-HRM

Electronic Human Resource Management (e-HRM) is not a completely new concept and has been in use since the early 1990s when the concept of e-commerce swept across the business world (Lepak & Snell, 1998; Olivas-Lujan, Ramirez, Zapata-Cantu, 2007). The term *e-HRM* is extensively used but a universally accepted definition is still unclear. It is often used synonymously with similar terms such as web-based human resources (Walker, 2001), human resource information systems (HRIS), virtual human resource management, human resource intranet, computer-based human resource management systems, and human resource portals (Ruël et al., 2004). These terms carry similar meanings, but for the purposes of this research, the term *e-HRM* will be used throughout.

Bondarouk and Ruël (2004, p. 2) loosely define e-HRM as “a way of implementing human resource management (HRM) strategies, policies and practices in organisations through a conscious and directed support of, and/or with the full use of, web-technology-based channels”. The same authors expand this definition in later work to include the communication component of e-HRM, where employee and employers, through e-HRM, are able to communicate about HR content more effectively (Bondarouk & Ruël, 2006). All employees are participants in processes due to the technological networks e-HRM creates, thus allowing HR professionals to direct their energies into promoting desired employee behaviour.

E-HRM is also seen as a collection of knowledge, principles and best-practice approaches to effective human resource management (Walker, 2001). Voermans and Van Veldhoven (2007, p. 887) view e-HRM “as the administrative support of the HR function in organisations by using Internet technology”, but also emphasise the importance of understanding that the introduction of e-HRM may lead to change in content and positioning of the HR function.

The application of web-based technologies to the human resource function combines two elements, namely the use of electronic media and the active participation of people in the process. People are the drivers behind the technology. They make use of the technology that helps organisations lower administration costs, improves employee communication and satisfaction, provides real time access to information, while at the same time reducing processing time and costs (Hawking, Stein & Foster, 2004).

E-HRM also involves many more stakeholders besides personnel in the HR department and the business and also includes job applicants and employees from all levels. E-HRM and the use of web-based technologies for human resource management practices and policies, are growing within organisational life (Bondarouk & Ruël, 2004). It is a novel way of looking at HRM, and its full potential is still being realised.

E-HRM is seen as the intersection between human resource management and information technology. It merges HRM as a discipline and in particular its basic HR activities and processes with the information technology field.

The Watson Wyatt (cited in Olivas-Lujan et al., 2007, p. 419) fourth annual survey of HR technology issues defines these concepts as “the application of any technology enabling managers and employees to have direct access to HR and other workplace services for communication, performance, reporting, team management, knowledge management, and learning in addition to administrative applications”.

2.2 SOCIO-TECHNICAL SYSTEMS THEORY AND E-HRM

This study is based on the socio-technical systems (STS) theory. This theory was selected as it views organisations as open systems, operating within an environment where technology affects the social aspects of work, and in turn these social aspects will affect the way the technology is implemented and maintained. It will also affect the attitudes towards the technology. This theory relates to the way in which e-HRM (the technology) affects the work of line managers and HR professionals (the social aspects).

As a starting point, one needs to examine some foundations upon which socio-technical systems theory is based.

Systems dimensions, as maintained by Cilliers (2003), include design, division of labour, levels of authority and reporting relationships, the nature of work tasks, processes and activities, organisational mission and primary tasks, as well as the nature and patterning of the organisation's task, living boundaries and the transactions across them as some of the system dimensions or components. This view of systems theory is linked very closely with the socio-technical systems theory, in that the added dimension of information technology, in the form of e-HRM, affects the above-mentioned dimensions. For example, the nature of work tasks, processes and activities would be altered by the addition of information technology. The nature of work performed by HR professionals and line management in terms of human resource management would be somewhat different when using e-HRM tools. The focus of work tasks would change from mainly transactional tasks to more transformational tasks, as e-HRM tools would alleviate a lot of the time involved in performing traditional HR tasks. For line management, their responsibilities may change somewhat with the introduction of e-HRM. They will now have to perform many of the operational HR tasks themselves, such as salary changes and leave approvals.

Socio-technical systems theory examines the influence of technologies on organisations and the effects of organisational process, culture and activity on technology (Bostrom & Heinen, 1977)

The socio-technical systems theory is one of the most widely used and accepted paradigms in social science (Heller, 1997). It is also underpinned by an extensive body of theoretical and experiential work regarding work design (Appelbaum, 1997). The historical beginning of this theory dates back to the early 1950s. Its origins are from extensive work done in British coalfields. The beginnings of the socio-technical systems theory can be traced to the various field projects initiated by the Tavistock Institute in the coal mining industry in Britain (Trist, 1981).

In the post-war reconstruction in 1949, the Tavistock Institute was tasked with two major projects. The first related to the investigation of group relations at all levels within an engineering company. The second project looked at innovative work practices and organisational arrangements that could potentially lead to increased productivity without major capital expenditure. The organisation in which this was applied was seen as a social system. The second project included the technical and the social systems, as well as the relationships between the two. This resulted in a new field of enquiry – the socio-technical systems approach (Trist, 1981).

This approach was formulated by Trist and Emery and other researchers at the Tavistock Institute of Human Relations. It was discovered that maximum results could not be achieved from new technological designs alone. The human component, although separate, interacts with technological components. From this, the concept of joint optimisation of social and technological subsystems was discovered (Trist & Bamforth cited in Mitchell and Nault, 2003; Heller, 1997), namely that work is designed in such a way that the two separate parts (the social/human and the technological) together create a transformed organisational structure and work redesign (Appelbaum, 1997). STS theory also looks at boundary management involving the interaction of the organisation and its environments. Resources and knowledge are exchanged through

the organisational boundary while the boundary protects it from external disorder (Appelbaum, 1997).

The socio-technical system design is built on the principle that an organisation comprising a business unit, team or other work unit, which is made up of both social and technical parts that are open to their environment (Trist, Higgin, Murray & Pollack, cited in Appelbaum, 1997).

According to this theory, organisations are made up of people who use tools, processes and knowledge to produce goods and services of value to their customers. The people component refers to the social system, the technical system refers to tools, methodologies and knowledge and the customers signify the organisation's external environment.

The concept of STS demonstrates the collaborative two-way relationship between people and technology, and looks at the design of these two systems in relation to one another and in relation to the demands of the external environment. The relationship, to a large degree, determines how effective the organisation will be.

The main characteristics of the socio-technical systems approach is that work should be seen, according to Badham, Clegg and Wall (2000), as:

- interdependent parts that form a system
- operating in the external environment by adapting to it and pursuing goals within it
- having its own internal environments made up of individual but interdependent technical and social sub-systems
- open socio-technical systems where goals can be attained through various means, meaning that variations of technology can be chosen for work organisation (this is known as equifinality)
- joint optimisation of technical and social subsystems within an open socio-technical system to increase performance

According to Appelbaum (1997), there has been a reappearance of STS theory due to technological advances and implementation in organisations in all industries. E-HRM is one such advancement that will be investigated here from the socio-technical systems theory perspective.

2.3 HISTORICAL PERSPECTIVE OF TECHNOLOGY AND ITS USE FOR HUMAN RESOURCE FUNCTIONS

When looking at the current usage and effects of e-HRM tools and technology, it is fundamental to understand the history behind the development of such technologies. To this end, the development of the Internet and specific human resource information technology will be discussed.

2.3.1 The use of computers in human resource management

Business today has been transformed by information technology and technology has become one of the driving forces of new policy, process and procedures for dealing with stakeholders within the organisation. One area where this has had a profound impact is in the human resource management function.

Computer usage in human resource management dates back to the 1940s and can be sourced to the storing and capturing of employee information through the use of skills inventories and payroll systems (Walker, 1980).

Developments were hindered by distinctive issues relating to the human nature of many of the human resource functions, such as job placement, counselling and other non-technical tasks. In addition, computer technology, generally, had not been tailored for human resource requirements at that time (Walker, 1980).

Walker (1980, p. 560) describes four stages in the revolution of computers for personnel use. The stages include “the primitives forerunners of the 1940s and early 1950s, systems based on the number crunchers available in the mid-1950s and early 60s,

overly ambitious efforts to include data from personnel in master plan management information systems in the 1960s, and external developments, primarily in government reporting requirements, that made personnel data systems a necessity rather than a luxury in the 70s".

As mentioned above, the 1940s and 1950s marked the beginning of the human resource technological revolution in the United States with the automation of skills inventory systems and payroll systems (Walker, 1993). Typically, these first systems were Electronic Accounting Machinery (EAM), which consisted of 80-column card systems that kept information such as employees' last name, initials, salary rate, work location, date of birth, gender and department code (Walker, 1980). Human resource management was recognised as being an early contender for office automation in payroll, benefits administration and transaction processing applications (Ball, 2001).

Changes within the human resource function where instituted as a result of unionisation, increased mobility of workers and demands for innovative and more effective ways of tracking employees. To sum up, the work load of human resource departments increased to the point where computerised personnel systems had become a must (Walker, 1972).

The late 1950s and early 1960s signified a time of massive growth and advances in technology (Walker, 1980). The majority of these developments took place in the areas of optical scanning equipment used for scoring tests in the field of education and the military, as well as for large-scale job analyses (Christal, cited in Cronin, Morath, Curtin & Heil, 2006).

Government's involvement in personnel issues triggered more thorough monitoring of organisations' workforces in order to comply with record-keeping requirements. This resulted in the "tacking on" of data elements to existing automated payroll systems. The 1960s were also characterised by organisations becoming more complex, which resulted in greater administrative demands on personnel departments. Such

development brought about opportunity and the formation of the company, Information Science Incorporated (InSci), who were responsible for the creation of the first packaged personnel system called PICS (Personnel Information Communication System) which was used for job matching. The development of this packaged system initiated requests for customised human resource packages to meet organisations' specific needs and resulted in the development of the personnel system called HRS II (Walker, 1993).

At this time, people with technical computer skills, such as programmers, were scarce and only company giants such as General Motors, AT & T, Mobil, General Electric, Ford and a few others were able to afford such resources. From the start, these companies saw the benefits of using computers in human resource management, in that they could capture basic information about many employees as well as automatically generate and print reports that previously required much manpower to produce (Walker, 1980). Also, the storage costs, capacity and usefulness of the data were fundamentally limited, and to get valuable statistics, it was necessary to develop independent fixed report systems. There was a high demand for new ways to coordinate and assemble growing amounts of data. This led to increasing interest in management information systems (MIS) as a way to record data once and make it available to those who needed it (Walker, 1980).

According to Gallagher (1986), from the 1970s, a greater significance was placed on the need for a computer-based system which could facilitate efficient and effective management of personnel. In comparison to other departments, human resource departments generally tended to be slow to recognise the value of such computerised personnel management systems. The need for human resource computer technology came about due to four main influences during this period.

Firstly, in the 1970s, many organisations were growing, resulting in increased employment and improvements in pay and working conditions. This changed considerably when the stress was placed on increased productivity from employees, more contract work and decreasing the work-force. This change highlighted the need for additional, better information about the organisation's workforce (Gallagher, 1986).

The second influence came from governmental demands related to labour legislation which called for increased statistical requirements (Gallagher, 1986).

Thirdly, advances in computer technology, in terms of greater processing power and capacity, enhanced the possibility for applying this technology to human resource management (Gallagher, 1986).

Fourthly, computer hardware has been the forerunner in terms of advances in technology; there was therefore a need for increased computer software for human resource management systems. Walker (1980) includes equal pay, equal employment laws, executive orders and their consequential demand for more information, as drivers for the need for and the subsequent development of some form of automated personnel data system. In the 70s, lower computer processing and storage costs made personnel data systems more accessible.

According to Hendricksen (2003), from 1960 to 1980, the integration of HR into core business and the need for governmental and regulatory requirements increased significantly. The arrival of mainframe computers in corporate America provided a technological solution to the increasing need for analytical and record-keeping requirements mandatory for accurate reporting as stipulated by various regulations. The human resource department became one of the principal users of this technology. These systems grew in size and capacity but continued to operate as mainly record-keeping systems (Kavanaugh et al., cited in Hendrickson, 2003).

Over the last two decades, the reliance on the human resource function to present solutions to boost efficiency and effectiveness of human capital, has been significant (Hendrickson, 2003).

The concept of e-HRM was precipitated by a number of significant changes within the business and social environments. First, the hardware, in the form of personal

computers, was required to conduct human resource transactions on-line. Personal computers formed the basis upon which e-HRM could be developed. Second, the users of the technology – employees and managers – would need to be computer literate to reap any benefit from e-HRM tools. Third, the Internet presented the linking channel of personal computers and computer-literate employees and managers in real-time. Connecting people and data removed many of the physical barriers that previously hindered interactions. Fourth, through enterprise resource planning software, it was possible to connect different business operations. Apparently dissimilar databases could now be constructed into a single whole, allowing for up-to-date transaction processing and decision-making. Fifth, human resource professionals along with information technology specialists, re-engineered HR processes to make them cheaper, better and faster (Aghazadeh, 2003).

Today, e-HRM tools have enabled the human resource function to boost efficiency and effectiveness of human capital, regardless of whether the organisation is large or small. With regulatory and competitive pressure steadily increasing, the need to manage human capital effectively has increased. E-HRM tools allow for the management of a rich variety of information about an organisation's workforce and also provide analytical tools to assist in decision making about the management of those assets (Hendrickson, 2003).

A major challenge faced by many organisations is integrating e-HRM tools and HRIS systems with enterprise-wide software such as an Enterprise Resource Planning (ERP) system. ERP systems link and integrate data and information from financial, operations, sales, human resources, supply-chain and other business functions to create a single, collective picture of the entire business and its processes. This type of shared database allows access to common data, reducing the need to continually integrate information from separate databases and software applications. In terms of human resource management, an interesting ERP vendor, according to Hendrikson (2003), is PeopleSoft.

2.3.2 Other technology used for human resource management

There are many information technology-based systems used for human resource management purposes. The most prevalent and most well known is human resource information systems (HRIS), followed by ERP systems.

According to Ruël (n.d.) and Ruël et al. (2004), there is a fundamental difference between human resource information systems and e-HRM. HRIS are intended for the human resource department where users of this technology are largely HR professionals who use the system to enhance processes within the HR department, with the aim of improving service to the business. E-HRM, on the other hand, is targeted at employees and management. The authors identify the main difference between HRIS and e-HRM. HRIS concerns the automation of HR services and e-HRM provides technological support of information regarding HR services. “Technically speaking, it can be said that e-HR is the technical unlocking of HRIS for all employees of an organization” (Ruël, n.d., p. 3). E-HRM is seen as a “way of doing HRM” (Ruël, n.d.; Ruël, Bondarouk & Van der Velde, 2007, p. 281).

The following is a brief description of these two concepts.

2.3.2.1 Human Resource Information Systems (HRIS)

HRIS, according to Hyde & Shafritz (1977), are more than simple averaging instruments for inventory control and accounting. These authors see them as the means for enabling managers to determine goals for human resources and to measure the achievement of those goals. In his early work, Walker (cited in Jones and Hoell, 2005, p. 321) defines HRIS as a “systemic procedure for collecting, storing, maintaining, retrieving, and validating data needed by an organisation about human resources, personnel activities and organisation unit characteristics” Walker (2001, p. 8) later explains that “HRIS is the primary transaction processor, editor, record keeper, and a functional application system which lies at the heart of all computerised HR work”. HRIS are based on automated databases which allow them to perform many types of management and analysis tasks

that have an impact on various business functions. Even thirty years ago, the extent or range of the tasks that could be completed by an HRIS was extensive and included career planning, equity monitoring, intake planning, position classification, position and person matching, productivity evaluation, promotion calculation, recruitment, resource allocation, training assignments and projections, and vacancy reporting (Hyde & Shafritz, 1977).

Many people think of HRIS as the hardware and software which are used to implement and measure human resource functions; however, this is not the case. Rather, human resource information systems have as their main focus the information – as opposed to the computers themselves. That is to say that the primary focal point of an HRIS is the reliability, validity and utility of the information, and then the automation of the process (Kovach & Cathcart Jr, 1999). However, one must remember that without the correct hardware and software in place, the information cannot be used effectively and efficiently.

There are many perceived benefits of using HRIS. Beckers and Bsat (2002) mention the following reasons why organisations should use HRIS. According to them, HRIS can:

- improve HR operations, and thereby increase organisational competitiveness;
- create a greater number and variety of HR-related reports;
- shift the focus of HR from the processing of transactions to strategic HRM;
- include employees in HRIS; and
- change the entire HR function of organisations.

HRIS may also contribute to reduction in costs, innovations and improved customer satisfaction (Ngai & Wat, 2006).

2.3.2.2 Enterprise Resource Planning (ERP) Systems

In the present day, Enterprise Resource Planning (ERP) systems have become, to all intents and purposes, the norm for many medium- and most large-sized organisations

(Peslak, 2006). Marnewick and Labuschagne (2005, p. 145) define an ERP system as "a packaged business software system that lets an organisation automate and integrate the majority of its business processes, share common data and practices across the enterprise and produce and access information in a real-time environment", and add that "the ultimate goal of an ERP system is that information must only be entered once". This is reiterated by Peslak (2006, p. 1288), who comments that ERP systems consist of "functional modules that are integrated through standard business processes and include all the data and information about vendors, customers, employees, and products".

In the many definitions and explanations of ERP systems, there is a common thread which runs through them all. ERPs are all about integration and real-time access to information (Marnewick & Labuschagne, 2005; Peslak, 2006; Ramayah & Lo, 2007).

ERP systems typically allow for integration of core corporate activities in an organisation, which means that the various departments can use this single integrated software programme that runs off a single database to communicate and share information. ERPs are software tools that provide information to those who need it when they need it (Tsamantanis & Kogetsidis, 2006).

There are many advantages to using ERP systems. Tsamantanis and Kogetsidis (2006) state that ERP systems in the HR space can standardise HR information. By having a unified simple method for keeping track of employees' time and communicating with employees about services and benefits, many issues faced by HR departments can be resolved. When correctly chosen and implemented, ERP systems reduce many costs. Some of the other potential benefits include drastic declines in inventory, huge decreases in working capital, more information about customers, and also the ability to monitor and manage suppliers, alliances and customers as an integrated whole (Chen, 2001).

On the other hand, ERP systems can be very complex, which may lead to difficulties in implementing, managing and maintaining them. Proper implementation of ERP systems can be very time consuming and very costly (Tsamantanis & Kogetsidis, 2006). Shehab, Sharp and Spedding (2004) agree with this, and also state that the implementation of ERP systems is a widespread, prolonged and expensive process which typically costs millions of dollars.

ERP systems automate many basic organisational functions, from finance and human resources, all the way to shop floor functions, with the objective of integrating information across the business and removing the need for complex links between software that does not and should not integrate. An integrated system has a single information entry point in the process which updates a database for all functions. The integration of information takes place in real-time and once captured into the system, the information can be easily accessed (Lozinsky, cited in Hirt & Swanson, 1999).

There are many ERP system vendors. The most well-known are SAP, Oracle, PeopleSoft, Baan and JD Edwards. Each system has its advantages and disadvantages and none is superior in every feature. The fit of its design against the requirements of the organisation are the important factors to consider when selecting an ERP system (Hirt & Swanson, 1999).

One of the main drivers of enterprise resource planning has been the integration of the technology from the assorted HR functions (Keebler, 2001). E-HRM is an extension of these technologies, adding strategic value, through automation and information, to the organisation.

2.4 E-HRM TODAY

Human resource management has had to change as the business environment has changed, that is, HRM has had to act both proactively and reactively in response to the changing business environment. For this reason, it is of the utmost importance that HRM

systems are flexible and adaptable, and that HR professionals acquire new knowledge to cope with the unpredictable nature of business. As such, HR professionals need to integrate their knowledge of core HR functions with the economic and business environment within which they work, and also keep abreast of technological developments. By doing this, HR professionals will be able to have a strategic impact on their organisations (Aghazadeh, 2003).

Having come to an understanding of the concept of e-HRM and having investigated the development of e-HRM technology since the 1940s, it is now necessary to contextualise e-HRM as it is today. The following sections will examine the manner in which e-HRM develops within organisations, that is, the types of e-HRM, the different e-HRM processes available and the effects of e-HRM on human resource professionals and line management.

2.5 E-HRM TYPES

In order to understand how e-HRM affects the work of human resource professionals and line managers, it is necessary to look at the various ways in which human resource management is conducted within organisations. There are three main types of E-HRM. These types of E-HRM are very closely related to the way in which HRM practices develop within organisations. Often, advances in HRM practices are technologically supported. E-HRM is seen, not as a specific stage of development of HRM but rather as a choice for an approach to conducting HRM.

Wright and Dyer (2000) distinguish three ways in which human resource management is conducted: transactional HRM, traditional HRM, and transformational HRM. This is confirmed by Bondarouk and Ruël (2006) as well as Lepak and Snell (1998), who make a similar distinction, namely operational HRM, relational HRM and transformational HRM. Strohmeier (2007) also identifies different types of e-HRM and refers to them as consequences. These consequences included operational, relational and transformational consequences. There are obvious parallels between the work of Wright

and Dyer (2002), Lepak and Snell (1998) and Strohmeier (2007). Lengnick-Hall and Moritz (2003) view e-HRM development slightly differently to other authors. They purport that e-HRM develops through three main waves within an organisation. The most simplistic form of e-HRM is all about publishing information. The next higher level of e-HRM involves the automation of transactions, and the most complex level of e-HRM concerns the transformation of how human resource practices are conducted in the organisation. Finally, Martin, Reddington and Alexander (2008) assert that e-HRM can be classified according to three dimensions namely operational HRM, relational HRM and transformational HRM.

Table 2.1 is a summary of the different approaches to e-HRM:

TABLE 2.1 E-HRM APPROACHES

Research by:	Approaches to e-HRM		
	Approach 1	Approach 2	Approach 3
Lepak & Snell (1998)	Operational	Relational	Transformational
Wright & Dyer (2000)	Transactional	Traditional	Transformational
Lengnick-Hall & Moritz (2003)	Publishing	Automation	Transformation
Bondarouk & Ruël (2006)	Operational	Relational	Transformational
Strohmeier (2007)	Operational	Relational	Transformational
Martin, Reddington & Alexander (2008)	Operational	Relational	Transformational

From the above table it is clear that lately, the authors again view the types of e-HRM as operational, relational and transformational, as originally postulated by Lepak and Snell (1998).

Operational human resource management involves basic administrative HR activities such as capturing of personnel data and payroll. The next area, relational or traditional human resource management, relates to more complex human resource activities such as recruitment and selection, training and performance management. The most advanced type of HRM is transformational human resource management and concerns interventions that are strategic in nature, like organisational change.

Within these types of HRM practices, an organisation will make a choice whether to conduct HR practices face-to-face or through e-HRM, as described in beginning of the chapter (Bondarouk & Ruël, 2006). The consolidation of terms referring to the approaches to HRM practices can be applied when referring to e-HRM development. These include operational HRM, relational HRM and transformational HRM. These approaches will be discussed briefly.

2.5.1 Operational HRM

Operational human resource management is concerned with streamlining operations (Lepak & Snell, 1998). It involves basic administrative HR activities such as capturing of personnel data and payroll. For operational HRM, the organisations needs to choose whether or not employees will keep their own personal information up to date through an HR website, or whether this will be done manually by administrators (Bondarouk & Ruël, 2006). The one-way communication from the organisation to its staff is characteristic of the first form of e-HRM, which involves simply publishing information. Intranets are the primary information delivery medium for this and include generic content such as the organisation's policies and procedures. This is often expanded to include more personalised information such as vacancies. This type of e-HRM is in itself extremely beneficial to organisations as it allows for more cost-effective dissemination of information by cutting down on printing costs. Changes to information can be updated as and when required so that users can access up-to-date, relevant information when

needed. Of course, the usability, quality and quantity of information could hamper the effectiveness of these efforts (Lengnick-Hall & Moritz, 2003).

2.5.2 Relational HRM

Relational HRM concerns the interaction and networking of the various HRM stakeholders (Strohmeier, 2007) and can be viewed as the second, more complex form of e-HRM. Within this type of HRM, there is a choice of whether to conduct more complex HR practices, like recruitment and selection using e-HRM, or to use a more traditional paper-based approach such as newspaper advertisements and paper-based application forms (Bondarouk & Ruël, 2006). Relational e-HRM also involves the automation of transactions through the use of intranets and extranets, HR portals, employee self-service and manager self-service, and operates with several application programmes (Lengnick-Hall & Moritz, 2003; Martin et al., 2008). These technologies facilitate relationships between users of the systems. The emphasis of relational HRM is not on the administration of HR processes, but rather on the manner in which HR tools support basic business processes such as performance management and recruitment and selection (Bondarouk & Ruël, 2006).

2.5.3 Transformational HRM

The final form of HRM entails the transformation of the human resources function. This is the highest-level and the most complex form of HRM. HRM shifts from a transactional to a transformational focus, whereby the human resource functions are relieved of the operational tasks and redirected towards more strategic initiatives (Lengnick-Hall & Moritz, 2003). Within this transformational HRM area, Walker (2001) breaks this down further into three types of work done in transformational e-HRM. These types of work include: strategic partnering with the business, creating centres of expertise and administration of service centres.

In order to move to the third level of HRM, Beatty (2001) identifies five success factors. These include changing:

- the culture of HR, the people employed in the HR function, and also their competencies, developmental needs and their performance;
- the roles and responsibilities of individuals performing HR activities, that is, the structure of the HR function;
- HR processes or HR products;
- service delivery and development; and finally;
- the technology used for HR functions, which may include enterprise-wide systems and custom systems.

From this, one can see the extent of adjustment needed when adopting e-HRM tools, including devolving some functions to managers, a decrease in administrative functions and higher expectations of HR professionals.

These types of HRM can be seen as different stages of e-HRM development within an organisation. Some organisations would use technology for transactional human resource activities, while others would use e-HRM in a relational way such as online job-boards. According to Bondarouk & Ruël (2006, p. 6), when using e-HRM for strategic, transformational purposes, “it is possible to create a change-ready workforce through an integrated set of web-based tools that enables the workforce to develop in line with the company’s strategic choices”.

An important factor to keep in mind, according to Ruël et al. (2004), is that in actuality, a combination of these types of e-HRM are utilised. E-HRM development is not a step-by-step process in reality. However, the authors comment that establishing a good transactional foundation is an important basis for relational e-HRM, and effective relational e-HRM should be in place for successful transformational e-HRM to be successful. Changes in the way that human resource professionals work are also required to support these developments (Bondarouk & Ruël, 2006). Organisational maturity, availability of and access to personal computers, number of human resource professionals and information technology specialists available are all factors that may

affect which form of e-HRM an organisation is able to adopt. How e-HRM is adopted will also differ from organisation to organisation. While some organisations might take a developmental approach, building up from operational, to relational to transformational e-HRM in a step-by-step manner, other organisations will make more aggressive changes, moving straight from operational e-HRM to transformational, strategic e-HRM. It seems that the first step in successful e-HRM is ensuring that decision-makers buy into the fact that the benefits outweigh the costs (Lengnick-Hall & Moritz, 2003).

Investigation of e-HRM studies reveals that much of the research supports the idea that e-HRM increases productivity through decreased requirements for HR staff, increased speed of process due to automation as well as cost reduction (Hawking et al., 2004; Ruël et al., 2004; Strohmeier, 2007).

The core goal of e-HRM is to assist the organisation and human resource professionals to get non-strategic, transactional HR tasks done quicker, more cost-effectively and with less dependence on HR staff. In so doing, HR can move onto the more tactical HR interventions by directing the intellectual capital (skills, knowledge and capabilities of individuals in the organisation), developing the social capital (relationships between individuals that promote innovation and greater productivity), and with the end goal of creating new products and services, improving customer service and developing greater value (Lengnick-Hall & Moritz, 2003).

The figure below depicts the categories of HR services and time spent on these activities by human resource practitioners. Operational administrative activities include functions such as record keeping and payroll. These activities account for the majority of an HR professional's time – up to 75%. HR professionals are so bogged down by the transactional activities that they have less time to dedicate to higher-value services. This does not imply that the transactional activities are not extremely important and fundamental to an organisation's achievement in managing its human resources. Basic, relational HR functions such as training, recruitment, performance management and compensation are the critical building blocks in people management. Finally, the most

complex level, transformational activities like knowledge management contribute the most – yet not much time is available for these activities (Wright & Dyer, 2000).

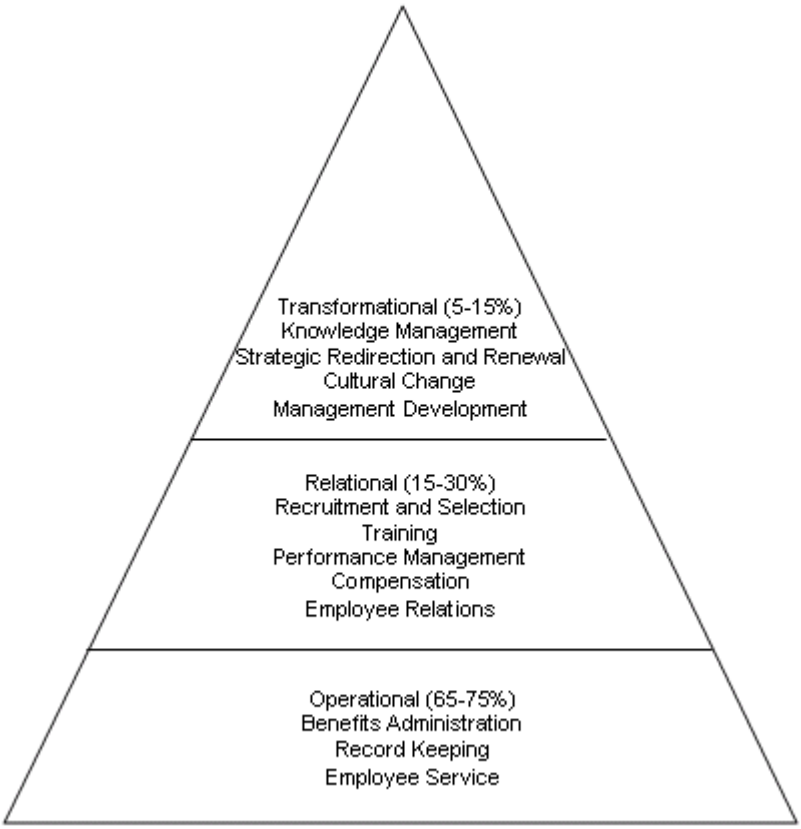


Figure 2.1 Traditional delivery of HR services (adapted from Wright & Dyer, 2000, p. 56)

More recently, HR function has had to play a more strategic role in the organisation. The only way to achieve this is to relieve much of the burden of transactional human resource activities in order to free up time so that HR can concentrate on traditional and transformational HR activities. This is done either by outsourcing some of the human resource function, but what would be more relevant to this study, is to utilise information technology in the form of e-HRM (Wright & Dyer, 2000).

Development and implementation of human resource-specific information technology systems is the first step in achieving this. In addition to this, new systems have been developed that allow management and employees to manage much of their own human

resource activities, such as leave application and approval, personal data changes etc. Thus, e-HRM systems aid in freeing up time for the HR function so that there can be greater focus on high-value strategic initiatives (Wright & Dyer, 2000). This is depicted in the figure below:

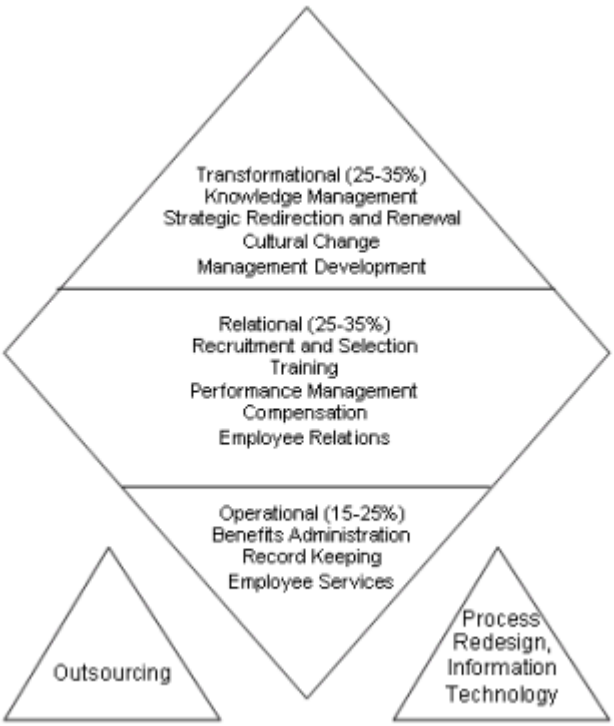


Figure 2.2 Strategic Delivery of HR
(adapted from Wright & Dyer, 2000, p. 57)

To summarise, e-HRM is divided into three types, namely, operational, relational and transformational e-HRM. There are many factors that would affect which stage of e-HRM development an organisation would be at, including buy-in from senior decision makers, organisational maturity and organisational culture.

The next section is a review of the HR processes that e-HRM can be used for.

2.6 USES AND BENEFITS OF E-HRM

E-HRM has shown importance and significance along the entire HR value chain. Walker (2001) includes the following key areas of e-HRM: employee and manager self-service; employee benefits administration; recruiting and staffing; performance management; compensation planning; employee development; and knowledge management. Panayotopoulou, Vakola and Galanaki (2007) also look at the ways in which e-HRM is used for human resource purposes. They separate human resource practices into the six key areas, namely human resource planning, acquiring human resources (including assessment), evaluating human resources, communication, rewarding human resources and developing human resources. This may be extended to include employee commitment (Wright & Dyer, 2000). Figure 2.3 depicts the HR value chain as viewed by the researcher:

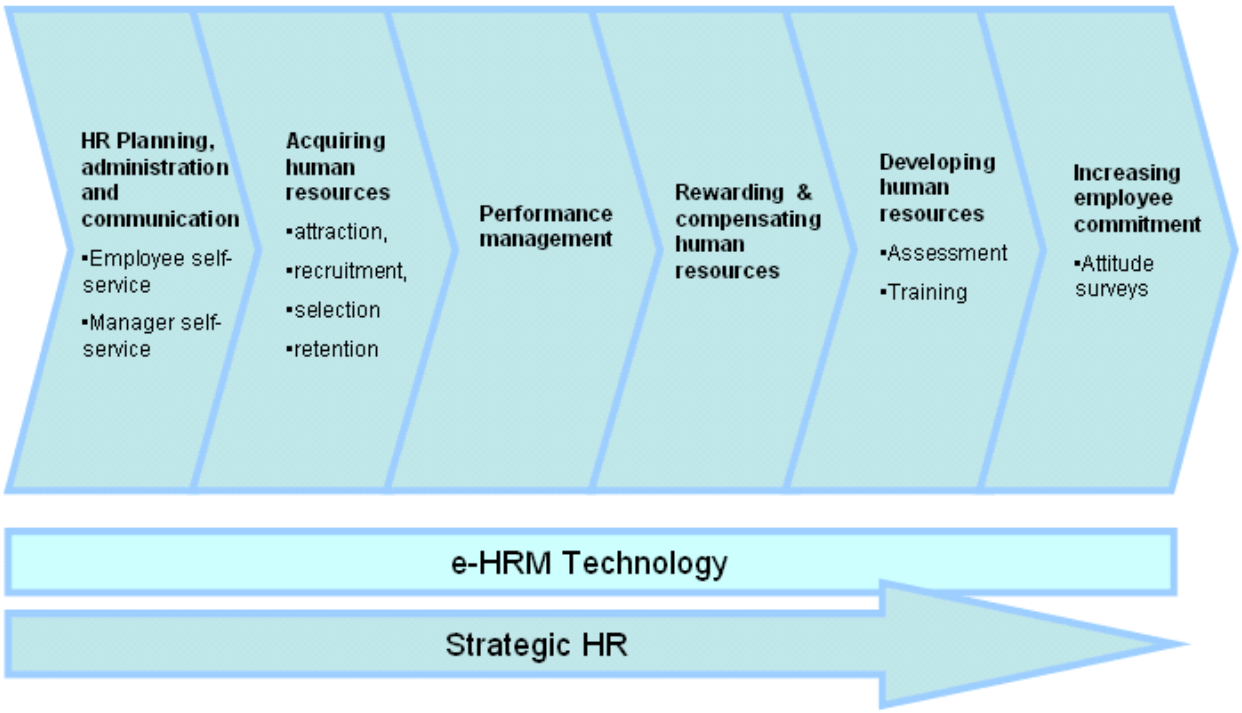


Figure 2.3 E-HRM value chain

The HR practices represented in the above figure are automated and facilitated through e-HRM, and in so doing, the strategic direction of HR is increased.

The following is a discussion of the various uses of e-HRM.

2.6.1 Human resource planning, administration and communication

Human resource planning, administration and communication with and between employees are areas in which e-HRM can add value. This is operationalised through HR self-service which includes employee and manager self-service.

HR self-service, according to Zampetti and Adamson (2001, p. 15), entails the “use of interactive technology by employees and mangers to obtain information, conduct transactions and essentially short-cut processes that previously required multiple steps, paperwork, the involvement of HR staffers, and all the delays such processes are heir to”. Through the implementation and subsequent use of employee and manager self-service applications, e-HRM has brought about considerable improvement in the updating of employee information, the posting of job specifications, changes in policy and procedure, training and staff changes. This type of employee and manager self-service leads to higher accuracy and data quality (Panayotopoulou et al., 2007).

E-HRM is also used as a means to communicate. E-HRM utilises the medium of e-mail (electronic mail) for communication purposes. Intranet and e-forums have also been highlighted recently as a fast, effective and easy way of transmitting information to employees (Panayotopoulou et al., 2007). In addition to this, Internet blogs hosted by an organisation are also being used to support communication.

Technology has played an important role in the collection and analysis of work-related information. For this type of work, computer programs are used to cluster jobs based on similar profiles and task inventories (Cronin et al., 2006). IT is used for automated content analysis to score open-ended responses to surveys and test questions by determining the frequency patterns of phrases and words. More recently, latent semantic analysis has taken content analysis a step further by improving the quality of the process (Cronin et al., 2006).

2.6.2 Acquiring human resources – attraction, recruitment, selection and retention

The process of acquiring human resources include attraction, recruitment, selection as well as retention.

One of the most prolific uses of e-HRM is that of online recruitment or e-recruitment. Ensher, Nielson and Grant-Vallone (2002) also view recruitment as the HR process that has been influenced the most by technology. E-Recruitment can be used in the full recruitment process and includes posting a position vacancy on the company website or intranet, online candidate application, search on established applicant database and online job boards, shortlisting, testing and assessment of applicants, and finally contracting with applicants. Online recruitment is seen to have many benefits, namely saving time and cost and increased quality candidate pool (Panayotopoulou et al., 2007).

Traditional recruitment and selection processes require extensive face-to-face communication with recruitment agencies and potential candidates. Also, labour-intensive assessments are often utilised which can be both cost and time consuming. E-HRM can aid in ensuring regulatory compliance by assisting in the monitoring of hiring decisions and hiring patterns (Wright & Dyer, 2000). In South Africa, this would for instance ensure that black economic empowerment targets are met.

Cohen (2001) views the recruitment process in six components which include sourcing and attraction; assessment and selection; hiring; deployment; retention and workforce analysis; and planning.

According to Cohen (2001), sourcing and attracting talent is seen as the area that is most influenced by technology. Organisations need to ensure the creation, maintenance and use of a constantly flowing pipeline of internal and external candidates applying for positions. The organisation needs to determine which people

they need and how to access them. The Internet has transformed this part of the recruitment process. E-HRM has, effectively, transformed organisations into their own global recruitment hub for external and internal applicants. E-HRM has made it easier for applicants to access information about available positions. E-HRM provides the mechanism for enterprise-wide yet customer-specific and user-friendly recruitment and staffing (Cohen, 2001).

Another area where technology is used in the recruitment process is that of assessment and selection. E-HRM helps by automating assessment scores, scheduling tests, and analysing performance evaluations for internal applicants or even for on-line skills testing or competency validations. An online recruitment system may include an applicant's résumé, salary history, contact details and various other important pieces of information. Through e-HRM, the job applicant can find out at which stage in the recruitment process he or she is. The end result of this process is the creation and filling of a qualified candidate pool from which to select a suitable candidate. The decision is based on factors that differ from organisation to organisation (Cohen, 2001). The selection process is most influenced by technology in the following areas: résumé scanning applications, online testing and assessment, and initial interviews (Ensher et al., 2002).

The hiring of appropriate candidates is another important element of the recruitment process that can be automated. E-HRM technology allows for workflow improvement and also supports the involvement of relevant participants in the hiring process. Finally, e-HRM technology ensures that business policy, guidelines, compliance and employment law are all considered in the process (Cohen, 2001).

In addition, e-HRM is used as a retention tool, ensuring that employees have access to information and self-service capabilities that empower them in various areas such as recruitment, training and development, and benefits management (Cohen, 2001).

Moreover, technology has played a role in assisting organisations to monitor the hiring process, that is, to ensure that non-discriminatory and fair recruitment and hiring are done (Wright & Dyer, 2000).

The Internet boom over the past ten to fifteen years has greatly impacted technology and computer applications in HR management functions (Aghazadeh, 2003; Cronin et al., 2006). Recruitment job boards such as Monster.com and South Africa's Career Junction as well as posting of job adverts online serve as the link between the hiring organisation and the job applicant. Similarly, organisations now have online recruiting that forms part of the company's webpage (Cronin et al., 2006).

The Internet has had an enormous influence on the way recruitment and selection are carried out globally (Bartram, 2000). One such influence is that organisations are increasingly recruiting and selecting applicants for roles online. Additionally, job seekers expect that a job can be found through the Internet rather than traditional methods. Another important trend is that the responsibility for recruitment and selection is now falling to line management, which impacts the design of recruitment and selection systems. Bartram (2000) predicts that in future, technology will impact selection in terms of the way interviews are conducted, reference checking is done and assessments are carried out.

There are many challenges when using online assessments (Stanton, 1999). These include unequal employment opportunities, validity, faking, computer skill level of test-takers, and privacy and security concerns. This is reinforced by Bartram (2000), who sees security, confidentiality, control over test conditions, control over practice and equality of access as the main issues associated with computer-based assessment. There are both advantages and disadvantages to online testing. On the positive side, online tests yield faster results, are easier to schedule, are more cost efficient in terms of printing and shipping, utilise multimedia testing stimuli and allow for tracking of assessment progress. On the negative side, online assessment can be difficult for those individuals not adept at using computers or that do not have access to the

needed technology; privacy and security issues may also result (Stone & Stone-Romero, cited in Cronin et al., 2006).

Technology plays an important role in managing the development and revision of measuring instruments. Using relational databases, item banks or collaborative item pools can be structured, allowing for a well-organised, easily accessible and user-friendly pool of appropriate assessment items which can be used for recruitment and selection purposes (Crespin & Austin, 2002). Crespin and Austin (2002) envisage that assessment databases will be accessible by management in the form of a library of assessment items that can be utilised for various purposes, for example, for performance assessment.

The above discussion has dealt with the attraction, recruitment, assessment, selection and retention of potential and current employees through the utilisation of e-HRM tools.

2.6.3 Evaluating human resources – performance management

Technology has a major impact on removing the administrative burden of performance management. It is commonplace for HR departments to use technology to help in streamlining systems. Typical technology applications include the use of the Internet and company intranets to support performance management, as well as the use of third-party vendors to assist with routine administration and modules created by enterprise resource planning providers to manage and track performance. In the category of using Internet and company intranets for performance management functions, organisations may choose to have online appraisal forms, administer and analyse 360 degree feedback or other inputs, or to create adaptive learning programmes to help assist managers understand the performance management system; finally, Internet and intranet may be used to create individual scorecards (Evans, 2001).

E-HRM can also be used in performance appraisal where the whole process can be automated and computerised, allowing for the performance appraisal to be conducted online through a company's intranet. An online performance appraisal system encourages standardised process and procedure where the specific criteria and measurements of given positions and roles are available. An online performance appraisal system means that much of the work involved in the appraisal can be done remotely by the employee and the manager. All information can be submitted directly to the human resource department in electronic form. This has proven to save both time and cost. The self-service application allows employees to manage their own personal performance goals based on performance appraisal results (Adamson & Zampetti, 2001).

Research conducted by Ensher et al. (2002), however, contradicts the above. Ensher et al. (2002) found that, while e-HRM is seen to assist in the distribution, collection and collation of performance management material, e-HRM has not revolutionised the performance management process, nor has it eliminated the challenges associated with traditional performance management processes.

2.6.4 Compensating and rewarding human resources

Compensation and rewards systems play a crucial role in attracting, motivating and retaining employees, according to Wright and Dyer (2000). However, these systems are not user-friendly, are time consuming and inflexible. So much so, that they are often not used properly, that is, information is not filled in correctly and set guidelines are not followed. It is believed that problems such as these can be alleviated somewhat by leveraging technology in this HR function. Compensation and rewards can be managed more effectively and with considerably less effort when using e-HRM (Wright & Dyer, 2000). According to Ensher et al. (2002), the management of benefits has seen radical changes due to technology.

E-HRM can be used to implement and communicate salary policies, but, more importantly, it can be used to tailor rewards and compensation to individual employees' needs. Cafeteria style compensation and rewards schemes managed through e-HRM tools are now a reality. Employees can make their own decisions about how to select from a variety of benefits or rewards to suit their individual needs. Similarly, with compensation, employees can tailor their own compensation packages. Where one individual values more time off, a four-day work-week with a lower salary may be suitable, while another may opt to have a hospital plan instead of full medical aid coverage (Wright & Dyer, 2000).

E-HRM has allowed for employee self-service as well as manager self-service. Employees are able to electronically select preferred benefits and rewards, thereby reducing the amount of HR administration required to implement these choices. Managers are able to make decisions about salary changes and increases, bonuses and rewarding of other benefits (Panayotopoulou et al., 2007). The war for talent, which is becoming increasingly competitive and critical, has made it necessary to use all the retention tools at hand. An obvious tool is an organisation's compensation and reward system. Technology is the key facilitator of this, allowing for a "bigger bang with individual employees with the same buck" (Wright & Dyer, 2000, p. 59).

Dietch (2001) writes about the connections between business and benefits through what she terms the "benefits website", a website where up-to-date benefit information is hosted. Through the website, employees can be taught how to make decisions about life insurance, health, disability and other benefits, and so become more independent with regards to their benefits.

It is clear from the above discussion that e-HRM plays a major role in reward and compensation, giving employees and managers independence and more control in these processes.

2.6.5 Developing human resources

E-HRM is widely used in the training and development of employees. This is seen as one of the most beneficial uses of technology in HR.

Technology has also played an important role in the area of training. Initially, this type of technology was used for flight simulations, which have now evolved into sophisticated training simulators and systems with greater physical and psychological integrity than was thought possible (Cronin et al., 2006).

E-Learning has been described by Sambrook (2003) as activities that are focused on learning and are supported by information and communication technologies. Training can be done through a company's intranet or through Internet, using the full range of multimedia such as downloadable video, video conferencing and links to resources. Technology can be used for training needs analysis, the actual activity of training as well as career management. The benefits of employing training needs assessments via online surveys include the ability to administer to a large population, less paperwork, lower administration costs, shorter distribution and response time, and higher response rate (McClelland, 1994). It also offers a solution to training in remote or disadvantaged locations through audio, video and web conferencing (Hirschman, 2001). Hempel (2004) comments on the revolutionary possibilities that information technology presents in training. Technology promises the ability to tailor training to individual needs. Expert systems and simulation models are a highly complex approach to achieve training that is customised to individual learning styles and needs, and is more than the mere transfer of training material to an online format.

Another option in training is delivering training through the Internet or a company intranet. This is certainly not a new concept and there are arguments regarding its effectiveness. Many organisations have seen online training as being beneficial in certain areas. Wright and Dyer (2000) have looked into the use of Internet-based training in attraction and retention. The following example elucidated by Wright and

Dyer (2000) demonstrates how Internet-based training might facilitate attraction and retention:

> *Widget.com, a fast growing, fast-paced e-business has in its employ a manager, Mr Brown. Mr. Brown arrives at work Monday morning and when he logs onto his e-mail, he finds a high-priority message with either an attachment or a link to a website. This is his Monday morning challenge from the CEO, and the system will track whether or not he links up and completes the challenge. When he goes to the link, he sees a digital video of his CEO telling him how people are Widget.com's competitive advantage, and that when they do not feel valued, they leave. Thus, his challenge to Mr. Brown is to make his employees feel valued today. To do so, he will in the next 10 minutes learn how to express appreciation to an employee. He then receives 6 learning points, he observes a digitised video model performing these learning points, he reviews the learning points again, and takes a learning point quiz. The manager then sees the CEO giving him the final challenge, that in the next 15 minutes he is to take one of his employees aside and express his appreciation to them using the skill he has just been acquired.*

There are many advantages to this process. Firstly, this type of training is not time-consuming compared to many other training programmes which can take up to a full week. Secondly, a real organisational value or necessary competency was communicated. Thirdly, there was no travel required, and fourthly, the training was short and to the point where a critical piece of information was communicated. Finally, this type of training is proactive rather than reactive. The organisation did not wait for the manager to realise there was a training need. From this example, it is clear that technology allows for organisations to deliver training and development for some skills or knowledge faster, more efficiently, and probably more effectively. It can merge

training, communication, and immediate response to strategic plans, and do so quickly (Wright & Dyer, 2000).

Ensher et al. (2002) identified many benefits associated with using e-HRM for training and development purposes, namely cost reduction by eliminating the costs associated with travel, time away from work, training material and refresher courses. Another identified advantage is that e-Learning may promote better, more effective learning, as there are no time limitations and training effectiveness can be tracked more effectively. The final advantage is that training can be delivered anywhere at any time.

In summary, training and development is one area where e-HRM can add a great deal of value. By automating training and development processes and material, the efficiency and effectiveness of training are increased.

2.6.6 Employee commitment

Finally, e-HRM is a tool that can be used to assist in assessing employee commitment. Through such an assessment, directed action can be taken, based on survey outcomes.

Attitude surveys play an important role in ensuring employee commitment, in the sense that employee commitment needs to be monitored on an ongoing basis to identify possible obstacles and deal with them quickly. Traditionally, it could take up to 18 months for employees to see responses to their concerns. The full survey process of development, administration, analysis, interpretation, decision making and finally, implementation of interventions is a very lengthy process. Technology can be used to shorten this cycle. Real-time attitude surveys can be conducted online and as soon as the employee has completed the survey, the data is entered and analysed. What used to take many months previously, now takes a few hours. This means that a manager could receive almost instantaneous feedback regarding the attitudes of his team, and could take some form of corrective action in real time. It must be noted that it is not the

technology that will solve the highlighted HR issues; the technology is rather the catalyst for transforming the way that human resources are managed (Wright & Dyer, 2000).

To conclude this section on the uses and benefits of e-HRM, one needs to realise that the HR processes addressed in the above section relate to the most important resource in the organisation – its employees (Aghazadeh, 2003). Performing HR processes well, by efficient HR planning, administration and communication, recruitment, selection, great performance management, well-structured compensation and reward processes, and appropriate training and development, results in increased employee retention and commitment. Ultimately, getting HR processes right is directly linked to positive effects on the bottom line (Aghazadeh, 2003).

2.7 EFFECTS OF E-HRM ON HR PROFESSIONALS

The very fundamental nature of work and how business is done has changed dramatically over the last twenty years. It is impossible to grow and develop today without considering, integrating and adjusting to what is going on within the business environment. The economy, globalisation and technological developments are some of the elements that have, in effect, been the drivers of this change. Clearly, e-HRM is one of the outcomes of the radical changes we are dealing with today. Specifically, technological advancements and the need for greater communication within and between organisations have become even more important.

Changes external to the organisation will also affect the internal operations of an organisation. E-HRM, in particular, is seen to have many effects on the way in which organisations manage their human resources – and this ultimately affects bottom-line profits.

The relationship between the organisation and the employee has changed dramatically. No longer is the balance of power in the hands of the organisation. Today, with a critical

skills shortage and individuals taking ownership of their careers, the power has shifted to the employee. E-HRM is seen as a vital tool to support this shift. E-HRM provides the means to improve HR service toward clients, reduce HR costs and improve the strategic orientation of the human resource function (Bondarouk & Ruël, 2006).

In summary, we see that there are six major effects or impacts as a result of the implementation and use of e-HRM tools. The first identified impact pertains to the change in focus of human resource professionals, from being transactional and administrative agents to functioning more as strategic business partners (Hempel, 2004; Lawler & Mohrman, 2003; Lengnick-Hall & Moritz, 2003; Lepak & Snell, 1998; Olivas-Lujan et al., 2007; Panayotopoulou et al., 2007; Wright & Dyer, 2000). The second impact relates to improvements in human resource service delivery (Adamson & Zampetti, 2001; Keebler & Rhodes, 2002; Lepak & Snell, 1998; Maatman, 2006; Zampetti & Adamson, 2001). The third recognised impact concerns the new competencies required from human resource professionals (Hempel, 2004; Lengnick-Hall & Moritz, 2003; Panayotopoulou et al., 2007). The shift of many human resource transactional functions to line management is seen as the fourth impact (Bondarouk & Ruël, 2006; Panayotopoulou et al., 2007; Ruël et al., 2004). Another important effect of e-HRM is that it will change the role requirements of human resource professionals (Bell, Lee & Yeung, 2006; Gardner et al., 2003; Maatman, 2006; Lepak & Snell, 1998; Voerman & Van Veldhoven, 2007; Wright & Dyer, 2000). Finally, confidentiality and security of human resource information or data will be affected by the implementation and use of e-HRM tools (Noe, Hollenbeck, Gerhart & Wright, cited in Hubbard et al., 1998). These effects will be discussed in the next section.

2.7.1 The human resource professional as a strategic business partner

An organisation's human resources have become their competitive edge. It is the HR function that is called upon to manage this all important resource, and to do this, it has had to become more strategic (Lepak & Snell, 1998). By re-engineering the HR

function, the focus can shift from clerical issues to more strategic issues (Hempel, 2004). Human resource professionals must partner with the business and be involved in development, planning and implementation matters concerning employees. With this approach made clear in the literature, the reality does not reflect this. This is confirmed by Wright and Dyer (2000), who show that transactional activities such as benefits administration, record keeping and employee service, take up between 65% and 75% of human resource professionals' time. Hawking et al. (2004) make reference to research conducted that indicates that HR administrative duties account for as much as 70% of HR professionals' time. In essence, for organisations that do not use some form of e-HRM, the majority of time is spent on administrative, routine, transactional activities (Lepak & Snell, 1998).

The shift from traditional HRM to e-HRM could mean that fewer HR professionals are needed, because e-HRM eliminates the "HR middle-man" (Lengnick-Hall & Moritz, 2003). This can be seen as an opportunity, as those HR professionals that are retained can hold specialist roles and act in a more strategic role. The positions of many HR administration staff may no longer be required and this may be seen as a threat to those individuals (Panayotopoulou et al., 2007).

Olivas-Lujan et al. (2007) identified in their research many sources that corroborate the fact that technological developments are facilitative tools that have allowed for human resource departments and professionals to become more strategic. Contributing to organisations' effectiveness is, according to Lengnick-Hall and Moritz (2003), greatly increased through knowledge management and creation of intellectual and social capital. These potential avenues are opened to HR professionals through the use of e-HRM. It can be said, therefore, that the change from transactional human resource management to a more strategic management function is enabled by the use of information and communication technologies, specifically by e-HRM tools. The administrative burden of handling day-to-day tasks such as leave applications, benefits management and training applications, can now be handled by the organisation's employees and managers using technology-aided tools (Olivas-Lujan et al., 2007).

This move has created a challenge for HR professionals to constantly update their knowledge in their respective fields, in order to play a value-adding advisory, consultative role to the business and thereby add strategic value (Ulrich, 2000).

A study conducted by Lawler and Mohrman (2003) explored whether HR is becoming more of a strategic partner, what leads to this role and whether or not spending more time on strategic activities is associated with increased effectiveness of the HR function. The authors found that in organisations where HR played a full strategic role, more changes were made in the way they designed and planned organisational development than in organisations where HR did not fulfil the role of strategic partner. They linked the implementation of e-HRM technology to the strategic partner role in that the technology frees up time in the HR department, which can then be spent on strategic activities.

An obvious connection between HR, information technology systems and strategic partnering is, according to Lawler and Mohrman (2003), through e-HRM tools, including self-service. Much of the transactional work performed by HR is eliminated and time is freed up for the HR organisation as a whole. This is often the single reason why greater use of information technology is associated with HR being more of a strategic business partner. Another reason why information technology such as e-HRM tools would lead to greater strategic impact of the HR function, is that with e-HRM, HR is better able to gather strategic data and analyse it in a way that contributes to shaping and implementing business strategy.

Research conducted by CedarCrestone (2006) found that workforce technologies enable HR to service the organisation more strategically. By affecting operational efficiencies through self-service, HR has been unburdened to focus their work on more strategic tasks, which include:

- gathering and providing measures for budgeting and policy making to highlight trends, thereby enabling HR and managers to be more proactive
- consulting on business issues with line management

- linking HR practices and technologies to improve bottom-line profit by taking a strategic view

2.7.2 Improved human resource management service delivery

While attempting to make strategic changes within the human resource function, HR professionals must still deliver good HR services to their stakeholders who include employees and managers. One of the most important fundamental principles in managing human resources is fostering the employment relationship so that employees may feel an attachment to their work and contribute willingly to the success of the organisation (Ehrlich, 1997). This is expanded to HR departments being “charged with simultaneously being strategic, flexible, efficient, and customer-oriented” (Lepak & Snell, 1998, p. 217).

Manager self-service and employee self-service are fundamental in e-HRM. This technology assists in meeting the needs of employees and managers, while supporting business objectives (Keebler & Rhodes, 2002). There is agreement on the fact that the employees of an organisation are just as important as its customers, and therefore need to be kept satisfied and motivated. This can be achieved to an extent by improving HR service delivery (Maatman, 2006). Keebler & Rhodes (2002) go on to discuss how, while improving HR efficiencies is the major focus in e-HRM technology design, it should also assist in making e-HRM technology more user-friendly. This should improve the service experience of the managers and employees. In this way, a client service improvement of the HR system can be achieved.

Zampetti and Adamson (2001) agree with this point. They point out that the concept of employee self-service is popular as it addresses critical HR goals, including: personal data quality, whereby employees enter and validate their own data which leads to improved data quality as the employee is the best source of personal information. The next goal identified by the authors is employee empowerment, which allows employees control over their own career development, conditions of employment, rewards and

access to information – so they can make informed choices. Process improvement is also seen as an important objective of employee self-service, allowing quick access to HR services and products for clients whose needs are varied and may be time-dependent. It also removes work in the HR function. The final goal is the integration of HR at the employee level to give a single, unified view of HR programmes, policies and procedures.

Similarly, when used for manager self-service, e-HRM offers clear and immediate advantages and added value. The objectives of manager self-service include improvement in the delivery of HR services, elimination of process steps, approvals and forms, speeding up and streamlining of workflow, reduction in administrative costs, improvement in management's access to important information, providing more time, and finally, enabling strategic HR (Adamson & Zampetti, 2001).

The literature indicates that by using e-HRM technologies, the cost and response times of human resource transactions are improved considerably. Quality and consistency of human resource information is also improved (Strohmeier, 2007).

In a study conducted by CedarCrestone (2006), respondents indicated that they achieved numerous quantitative results from using e-HRM tools. Efficiencies achieved include head-count reductions, transactional and compliance cost reductions as well as reduced time to hire.

TABLE 2.2 QUANTITATIVE RESULTS ACHIEVED FROM WORKFORCE TECHNOLOGIES WORLDWIDE (CedarCrestone, 2006, p. 7)

Category	Results	Technologies
Head-count	18% average reduction	Self-service
		Call centre
		HRMS
ROI	Varies	Various
Transaction costs	25% average reduction	Self-service
Cycle time	66% average time reduction	Self-service
Time to hire	38% average reduction	recruiting solutions
Compliance	75% - 100% cost reductions	HRMS
Service centre inquiries	20% reduction in specialist time	Self-service
		Call centre

While a multitude of benefits of e-HRM are espoused, it is important that e-HRM not be viewed as a technological solution. The efficiency of HR processes and increased access and quality of HR data are not the main objective; rather, e-HRM should be seen as an “enabler of transformation” of HR and the organisation (Reddington & Hyde, 2008, p. 140).

2.7.3 News skills and competencies required for human resource management

The changes mentioned above make it clear that, with the implementation and use of e-HRM tools, there is a need for additional skills for HR professionals (Maatman, 2006).

According to Hempel (2004), the following broad competencies are required from HR professionals to meet the challenges and needs presented by utilising e-HRM tools. The primary skill required is mastery of the behavioural and psychological foundations of human resource management. Secondly, a strategic orientation with broad knowledge of the legal environment and organisational structure and processes is required; and finally, an understanding and mastery of the new technologies that are influencing the design of organisations, work, and HR systems.

While many researchers agree that the first two competencies, understanding organisational behaviours and viewing the organisation from a strategic perspective, are generally covered in most human resource management and organisational psychology training, the third, technological competency, is lacking (Hempel, 2004). HR will still need to be responsible for the traditional HR practices such as recruitment and selections, compensation and performance management, but the responsibility will shift from hands-on, face-to-face service delivery to system maintenance and design, which will require further information technology skills and knowledge (Lengnick-Hall & Moritz, 2003). Most HR professionals lack the technical skills, but this knowledge has to be acquired to be successful in the current business environment (Hempel, 2004).

In a study conducted by Bell et al. (2006), the importance of specific HR skills required when implementing e-HRM technologies, was examined. In the study, HR professionals from various organisations were interviewed. The HR professionals indicated that strategic skills, functional skills and IT skills were required when adopting e-HRM technologies.

2.7.3.1 Strategic skills

Bell et al. (2006) mention several skills that facilitate a more strategic focus, namely considering an organisation's financial, strategic, and technological abilities; the capability to ensure alignment between the business strategy and the HR strategy, and the communication of these strategies to the workforce; the ability to facilitate, analyse and assist line management to solve problems; an understanding of how HR can increase bottom-line profits; and finally, the ability to view issues from a customer perspective.

2.7.3.2 Functional skills

By eliminating much of the administrative, transactional activities that HR were previously responsible for, means that HR professionals can now take on more

specialised roles requiring expertise within a specific field. Specialising in a specific functional area of HR leads to improved service delivery; therefore it is extremely important that HR professionals receive appropriate education and training so that this specialisation can happen. The authors distinguish several skills required for this, namely knowing what best practice in various functional areas are; being able to deliver state-of-the-art innovative practices; and the ability to deliver practices to organisational members. It is also important that the training needs of the HR professional are reviewed, as well as the specific needs of the organisation (Bell et al., 2006).

2.7.3.3 IT skills

While additional strategic and functional skills are required, there is also a need for additional IT skills. HR professionals are ultimately responsible for e-HRM technology. This implies that they have to be able to give input into the development of the tools, and also have an understanding of basic IT issues (Maatman, 2006). Bell et al. (2006) elaborate on the IT skills required, saying that it would include proficiency with HRIS usage; the ability to use web-based channels to deliver services; the ability to teach others how to use HR technology; understanding of the technological aspects for identifying technology needs and managing technology vendors; and capabilities for using technology to collect data and transform it into strategically valuable information.

2.7.4 Human resource management responsibilities for line managers

According to Bondarouk and Ruël (2006), e-HRM has led to considerable changes in terms of what managers do. Through e-HRM, many activities previously performed by human resource professionals can now be conducted by managers and employees. Managers, on their personal computers, can capture performance appraisals, monitor absenteeism and turnover, generate HR reports, and reward employees.

E-HRM, through employee and manager self-service, leads to greater participation of employees and management in human resource practices (Ensher, 2002). Managers

become more HR savvy, which allows for some devolvement of HR professionals in the more administrative HR activities such as management of salary increases (Panayotopoulou et al., 2007; Ruël et al., 2004). Line management and employees can play an active role in HRM strategies, policies and practices (Ruël et al., 2004).

2.7.5 Changing role requirements of human resource professionals

One of the challenges faced by HR professionals is promoting technology in a manner that supports and reflects the business's strategy. The focus is on more efficient and effective HR solutions. As mentioned previously, the human resource function has become a critical business partner in driving business success through strategic human resource management. Changes in the role of human resources are inevitable in light of these technological developments that are commonplace in many organisations today.

Wright and Dyer (2000) examine the roles that human resource professionals serve. This is based on the model developed by Ulrich (1997), which divides HR roles into four clusters, namely strategic partner; change agent; administrative expert; and employee advocate. These roles are derived from two dimensions: people versus process, and strategy versus operations (Ulrich, 1997). These roles are very much still required and present in today's changing world of work; however, the priority of roles has shifted. The shift in priority can be attributed in part to technological development in the HR space, such as the development of e-HRM. This is demonstrated in the figure below:

FROM		TO
Strategic partner	→	Change agent
Change agent	→	Strategic partner
Administrative expert	→	Employee advocate
Employee advocate	→	Administrative expert

Figure 2.4 Change in HR roles
(adapted from Wright & Dyer, 2000, p. 54)

Figure 2.4 can be explained as follows: It is expected that the role of strategic partner would be the most important today, as this is demanded by business leaders and encompasses the skills that are lacking within organisations. Surprisingly, this is not the case in organisations that utilise e-HRM. Rather, there is a shift in priority. Wright and Dyer (2000) discovered in their research that the role of change agent is in greater demand, given the speed and uncertainty of business challenges apparent today. What is interesting is that the role of change agent does not take precedence over that of strategic partner; rather, there is little distinction between the two roles, that is, one cannot function in the capacity of change agent without having the strategic business outlook, and vice versa.

This is further emphasised by Lepak and Snell (1998) who concur that, while HR professionals are asked to fulfil a strategic role, this can only be done by means of change management. The authors looked at a survey of 1700 HR professionals. The survey indicated that work in organisational change and involvement with senior management in business strategy played a more substantial role than traditional HR activities. The survey also showed that the skill of change management had become more important in recent years.

Voermans and Van Veldhoven (2007) expand on Ulrich's (1997) model. They suggest that the first role of strategic partner concerns the formulation of HR strategy and links this strategy, through aligned processes, to the organisation's policy. The second role of change agent requires that the HR professional develops and facilitates changes that are aligned to long-term targets. The third role, administrative expert, looks at the HR function from an administrative perspective, which concerns all HR transactions. In the final role of employee champion, HR focuses on supporting employees and managers and the achievement of short-term operational goals.

Gardener et al. (2003) conducted research into the impact of IT on the role of HR professionals. This was done by investigating how the jobs of HR professionals were affected by the use of information technology within the HR department. Specifically,

the authors examined how HR professionals managed HR information. They also considered the expectations placed on HR professionals as a result of increased reliance on IT. Their findings suggest that there is a positive relationship between the role of change agent and strategic partner. Also, it is expected that HR managers and executives will have a positive attitude towards e-HRM, as it allows the HR professional the opportunity to focus on strategic HR functions instead of transactional tasks (Voermans & Van Veldhoven, 2007).

Maatman (2006) describes two major goals of e-HRM: firstly to improve the strategic orientation of HRM, and secondly, to improve service quality to employees and managers. As mentioned by many other authors (Hempel, 2004; Lengnick-Hall & Moritz, 2003; Lepak & Snell, 1998), e-HRM technology should remove much of the time-consuming administrative activities and therefore free up more time for HR professionals to focus on strategic initiatives and delivery of vital face-to-face HR functions. Based on this, it is believed that the use of e-HRM will alter the job content of HR professionals.

As with many technological advances, e-HRM is not without its pitfalls. Pollitt (2006) highlights some of these drawbacks. One of the major challenges when implementing e-HRM is that technology, processes and people capacity need to be managed concurrently. One of the risks that Pollitt (2006) draws attention to is that of singular focus, where only the technological aspect is focused on at the expense of the process and people components. If this happens, people who would be affected by the change of technology implementation may not be well prepared. It is also vitally important to ensure that there is senior management buy-in, but when preparing a business case for e-HRM, the risks and challenges along with the rewards must be highlighted. Another challenge that may be faced when implementing or using e-HRM, is that the culture of the organisation does not support the success of e-HRM tools.

Panayotopoulou et al. (2007) emphasise that e-HRM is much more than just technology. Competent HR professionals are needed to ensure the success of e-HRM

development and implementation. HR professionals need to take on an active role as developer of e-HRM functions. This can be seen as a further opportunity in the HR profession. “Technology itself may be value neutral, but how it is used can greatly impact one’s life and work balance” (Ensher et al., 2002, p. 238), and in essence the actual HR role.

2.7.6 Confidentiality and security

The privacy, confidentiality and security of information in organisations have become a contentious issue in recent years. Phillips, Isenhour and Stone (2008) attribute this to the increased use of e-HRM to collect, store and disseminate information regarding job applicants and employees. Organisations of the past held all personnel records in filing cabinets. This is no longer the case. With a simple click of a mouse, one may have access to the information of past, present and prospective employees (Hubbard, Forcht & Thomas, 1998) that can easily be distributed to a third party. Individuals are understandably concerned about access to this type of information (Phillips et al., 2008).

Those that are involved with and make use of an e-HRM system are numerous and varied, and may include industrial and organisational psychologists, human resource practitioners as well as management and employees. All these stakeholders are bound by the professional, ethical codes of the organisation as well as the law of the country.
According to Noe, Hollenbeck, Gerhart and Wright (cited in Hubbard et al., 1998), the following concerns regarding confidentiality when using e-HRM need to be addressed: firstly, one needs to decide what type of information about the workforce should be stored on the system; secondly, it has to be confirmed who would have access to the data; and finally, it needs to be decided who would have authority to modify information stored on the database.

Phillips et al. (2008) put forward a set of guiding principles for privacy when working with e-HRM. The following is a brief summary of these guidelines:

- Collect only information that is applicable to the decision that needs to be made.
- Establish record retention policies to safeguard information that is on the database.
- Ensure that explanations are given for why information is being collected and how it will be used.
- E-HRM systems should be used in conjunction with traditional systems to increase validity and reliability.
- Provide policies and procedures regarding accessing information from the organisation's database.
- Develop and enforce privacy policies related to e-HRM methodologies.
- Ensure that there are HR specialists available who are knowledgeable regarding the e-HRM system and content, to assist employees and managers.

E-HRM tools provide many benefits for organisations, but it is important to also be aware of some of the negative aspects associated with its use. As laid out above, ensuring privacy, confidentiality and security of potential, current and past employees could become an issue if concerns regarding access to information are not managed effectively by the organisation. As such, policies and procedures relating to e-HRM must be put into place to ensure that information is used ethically.

2.8 IMPLICATIONS OF E-HRM FOR INDUSTRIAL AND ORGANISATIONAL PSYCHOLOGY

The scope of practice of industrial psychology involves "applying the principles of psychology to issues related to the work situation of relatively well-adjusted adults in order to optimise individual, group and organisational well-being and effectiveness" (HPCSA, n.d.).

Cascio (1998, p. 328) differentiates between personnel psychology and human resource management. He says, "Personnel psychology is an applied discipline that focuses on individual differences in behaviour and job performance, while personnel/human resource management is the attraction, selection, retention,

development and utilisation of human resources in order to achieve both individual an organisational objectives."

By differentiating between these two seemingly overlapping concepts, it is hoped that a clear distinction between these two roles within the organisation can be made. Many studies, however, indicate an overlap in workplace practices of IO psychology and human resource management (Venter & Barkhuizen, 2005).

According to Rothmann & Cilliers (2007), the most important task of the IO psychologist is to apply psychological principles to workplace phenomena. IO psychologists take a special interest in the effectiveness of the organisation and the psychological health of its employees. It is also recognised that, in addition to understanding individual influences on individual behaviours, IO psychologists need to view the organisation from a multilevel model perspective, where teams and the organisational context also influence workplace behaviours and attitudes, and individuals can influence higher level results (Ryan, 2003). The authors summarise the four broad tasks of IO psychologists as "1) explaining individual, group and organisational behaviour and optimising functioning, 2) measuring behaviour and predicting potential, 3) contributing to organisational development, and 4) translating IO research findings and empowering potential users thereof" (Rothmann & Cilliers, 2007, p. 10).

Rothmann and Cilliers (2007) proceed to explain the importance of the involvement of IO psychologists when new technology is introduced into organisations. They believe that it is necessary for IO psychologists to be involved in the implementation of the technology; they look at this from a systems perspective in that changes in the task subsystem (e.g. technology) must also include changes in the psychosocial system, which includes knowledge, skills, attitudes and values (Robbins, Odendaal & Roodt, cited in Rothmann & Cilliers, 2007).

Traditionally, IO psychology covers similar domains to HRM. These may include the effective selection of human resources, performance management, development and

survey work (Crespin & Austin, 2002). IO psychologists today also utilise information technology in their work. A major area where IO psychologists can use information technology is that of computerised and distance assessment of individuals and groups. Another area where technology is used in IO psychology practice is learning, which may include computer-assisted training and individual skill acquisition. Job analysis explains the description, analysis and grouping of jobs and is another key function that IO psychologists perform. IO psychologists also have a special interest in groups and teams at work. Finally, yet another application that IO psychologists would be involved in is computational modelling of complex behaviour system (Crespin & Austin, 2002).

In terms of the current research study, which involved looking at attitudes toward e-HRM tools, the IO psychologist would play the role of specialist and organisational psychologist, with an overall goal to "improve organisational functioning through understanding the interaction between humans and their work environment from a psychological perspective" (Venter & Barkhuizen, 2005, p. 51). By looking specifically at the attitude of human resource professionals and line management towards e-HRM tools, IO psychologists are able to evaluate the interaction of these groups of people at work within the technological environment in which they now operate.

Consequently, while human resource professionals are the individuals in the organisation that would operationalise the use of e-HRM tools within the business, IO psychologists would be concerned with how these tools affect the work behaviours, roles and attitudes of the users of e-HRM.

2.9 CHAPTER SUMMARY

This chapter focused on the concept of e-HRM and its historical routes. The stages of e-HRM development were then explored, followed by an examination of the HR processes which can be automated by e-HRM, as well as the various impacts e-HRM has on the work of human resource professionals and line managers. These findings are viewed

from the socio-technical systems perspective. Finally, the implications of e-HRM for IO psychologists are explored.

The next chapter will focus on the research methodology that was followed in this study. It includes a discussion of the determination and description of the sample, the data collection and analysis, and the statistical methods used to analyse the results.

CHAPTER 3 EMPIRICAL STUDY

3.1 INTRODUCTION

Phase two of the research entails an empirical study in which the statistical strategies that can be used to investigate attitudes towards e-HRM tools within a typical financial institution are determined. This phase consists of the following steps:

Step 1 Determination and description of the population and sample
Step 2 The measuring instrument
Step 3 Formulation of research hypotheses
Step 4 Data analysis procedures
Step 5 Reporting and interpretation of empirical results
Step 6 Integration of the literature and empirical results
Step 7 Formulation of research conclusions, limitations and recommendations

Steps one to four will be covered in this chapter, and steps five and six in chapter 4; step 7 will follow in chapter 5.

3.2 DETERMINATION AND DESCRIPTION OF THE POPULATION AND SAMPLE

This research was conducted in a large South African bank. The population of this study consisted of all line management and HR practitioners at the head office, which is situated in Gauteng. A proposed sample of 120 individuals was suggested as the appropriate size/number. A combination of convenience, judgemental and quota sampling were the sampling strategies utilised. Participants were selected based on the researcher's networks and their referrals. Also, both line management and HR professionals were required for the sample; for this reason, judgemental and quota sampling methods were employed. A sample size of approximately 120 respondents was required and the members of this sample needed to have exposure to HR processes.

The researcher, with assistance from a senior HR practitioner distributed the questionnaires by hand to line management and other HR professionals. In total, 97 questionnaires were distributed by hand and 50 were returned. To increase sample size, a list of HR professionals and line management taken from the organogram was compiled and the questionnaire was sent via email to these potential respondents. In total, 118 questionnaires were emailed, and 54 individuals completed the emailed questionnaire. Respondents were sent three reminders via email, contacted telephonically and offered an incentive to complete the questionnaire, which resulted in a very high response rate of 48%.

3.3 MEASURING INSTRUMENTS

3.3.1 Development

An attitude measure in the form of a structured questionnaire was developed, pre-tested and utilised for the purpose of this study. The initial decision was made that an attitudinal measure was required to collect data about the topic in question. The framework outlined in Dyer (2006) for developing a questionnaire was utilised to ensure that the questionnaire was appropriately designed. The following is an outline of how this methodology was applied for the purposes of this study.

Based on the initial research proposal, a problem statement was put forward and ideas were generated around this. An extensive search of the literature was conducted in order to see whether or not a questionnaire covering the same topic could be found. Once it had been established that no such instrument was available, it was decided that the tool needed to be constructed by the researcher. Further review of the literature led to the creation of specific questions which would link with the themes already identified in the literature review. A number of reversed (negatively worded) questions were included to control for response bias and increase the validity of the scales (Oskamp, 1991). Subject matter experts were consulted to review suggested items for the

questionnaire. Once developed, the questionnaire was informally reviewed by appropriately experienced individuals who have a background in research in the social sciences. This was done in order to ensure that the intended meaning of the questionnaire was apparent and that the questionnaire was clear and easy to use.

The questionnaire consists of three main sections, which can be described as follows:

Section one was made up of closed questions where the choice of possible answers was decided by the researcher, with respondents being asked to select one option from the given list. In section one, biographical and occupational information on the respondent was collected, specifically including data regarding position, level, segment, qualification, tenure, age, gender and race.

Section two also consisted of closed-ended questions. The e-HRM tool usage section of the questionnaire was designed to measure actual usage of the e-HRM tool within the company, as well as the respondent's preference for manual usage versus the use of e-HRM tools for different components of the HR process. This section describes e-HRM tool usage compared to manual process preference trends in the sample as a whole as well as by the different demographic components, to determine whether there is any need to control for demographic variables in the remaining analysis.

Preference for process style – whether manual or using a tool – was assessed separately for each of the components of the HR process, and also at a total HR process level. To ascertain total preference for either e-HRM usage or manual usage, the frequency of preference for either tool within each of the HR processes was obtained for every respondent.

In section three of the questionnaire, 51 questions were grouped according to six dimensions. This section investigates the respondent's attitudes towards e-HRM tools. These are outlined in section 3.3.2 of this chapter.

According to Kerlinger and Lee (2000, p. 712), a summated rating scale, such as the Likert-type scale, “is a set of attitude items, all of which are considered of approximately equal attitude value, and to each of which participants respond with degrees of agreement or disagreement”.

The scale used in the e-HRM attitudinal measure is a five-point Likert-type scale. Respondents were presented with five alternate responses to each question on an agree/disagree continuum. The options were as follows:

1 = Strongly disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

Finally, two open-ended questions were included in the questionnaire. These questions did not form part of the data analysis, but were used to contextualise the information extracted from the questionnaire, to assist the researcher in getting a deeper understanding of the attitudes towards e-HRM, and for interpretation purposes.

3.1.1 Rationale and aim

The aim of developing an e-HRM attitudinal questionnaire was to gain an understanding of the attitudes towards e-HRM practices of HR professionals and line management, which includes individuals who use e-HRM practices, individuals who use manual HRM practices and those individuals who use both e-HRM and traditional manual HRM practices combined.

3.3.2 Dimensions

The initial instrument was constructed to include six separate dimensions. Questions were designed around these identified dimensions. These dimensions were:

(1) The human resource professional as a strategic business partner
(2) Human resource management service delivery
(3) New skills required for human resource management
(4) Human resource management responsibilities for line managers
(5) Confidentiality and security, and e-HRM
(6) Changing the role requirement of human resource professionals

3.3.3 Administration and capturing of data

The e-HRM attitudinal questionnaire is a self-administering questionnaire and takes approximately 20 minutes to complete. There was no time limit in which to complete the questionnaire, but respondents were encouraged to answer based on initial interpretations of the questions. All necessary instructions are given in the questionnaire. Respondents were able to complete the questionnaire either using a pencil-and-paper version or an identical, electronic version.

3.3.4 Interpretation

Each subscale was measured separately and reflects the attitudes of the respondents in these dimensions. As a result, an analysis can be carried out as to which dimensions are perceived to be true for the respondent and which not. This serves as a useful tool to ascertain the attitude of respondents towards e-HRM tools.

3.3.5 Validity

Validity, according to Clark-Carter (2004), refers to the degree to which that which the researcher intended to measure, is actually being measured.

Construct validity of the measure was obtained as the scale indicated significant differences between users and non-users of e-HRM tools. This is to be expected if the questionnaire measured attitude towards e-HRM reliably. In this way, construct validity was proved as the questionnaire measured what it was supposed to measure.

As mentioned previously, a number of negatively worded questions were included in the questionnaire to control for response bias and to increase the validity of the scale. For analysis, these questions will be reverse-coded to ensure that the higher score corresponds with a positive response.

3.3.6 Reliability

To ascertain the internal consistency of the attitudinal component of the e-HRM measurement instrument and the six attitudinal subscales, the Cronbach's alpha reliability coefficient was calculated for overall scale and corresponding subscales that were developed to measure attitudes towards e-HRM tools. Due to the low reliability obtained for three of the subscales, the structure of the e-HRM measurement instrument was assessed, with exploratory factor analysis using principal axis factor analysis with oblique rotation. Evidence of one general scale (evident by the high variance explained by the first dimension) and evidence of scale dimensionality were found. The revised reliability estimates after removing items with low item total correlations, found a high Cronbach's alpha value for the total scale and also for the two subdimensions.

3.3.7 Justification for inclusion in the research

The data collection was conducted through the use of an attitudinal questionnaire developed by the researcher. A questionnaire was used as the data collection technique as, according to Dyer (2006), "it can be tailored to meet the needs of almost any inquiry" and is seen as effective when clearly defined information, on a restricted range of topics, is required.

3.4 FORMULATION OF RESEARCH HYPOTHESES

The following research hypotheses are formulated with a view to covering the objectives of this study.

H_1: HR professionals have a greater preference for utilising e-HRM tools than line management or other groups.

H_2: Differences in demographic characteristics (gender, age, race and qualifications) affect attitudes towards e-HRM tool usage.

H_3: There is a difference in overall attitudes towards e-HRM tools, depending on the job level, role in the organisation and number of years with the organisation.

H_4: Users of e-HRM tools have a more positive attitude towards these tools than those using manual processes.

H_5: There is a difference in overall attitudes towards e-HRM tool usage, depending on the HR process used.

3.5 DATA ANALYSIS PROCEDURES

This section describes the statistical procedures that were carried out. The statistical techniques were applied using the Statistical Package for the Social Sciences (SPSS) computer program for Windows, version 16.0. Responses to the survey instrument was coded and captured into a Microsoft Excel spreadsheet, which was converted to an SPSS datasheet. The data was checked for errors and cleaned, and the total scale and six subscales were created by obtaining a mean of the items which form each of the scales. The demographic profile of the respondents was examined initially to determine the occupational as well as demographic structure of the sample. The results were presented using pie charts and bar graphs.

3.5.1 Sample demographics

Frequency distributions, according to Henn, Weinstein and Foard (2006, p. 206), “are useful tools for providing an overview of the proportionate breakdown of a variable into its component categories”. The first step in ordering the data set is to identify the range of scores and establish the frequency with which each occurs. Sample demographics were obtained using analysis of the frequencies of respondents in each of the demographic categories (age, gender, race, qualification, job level, occupational position or role, and number of years with the company), as well as within the tool usage section and attitudinal measurement section.

3.5.2 Internal consistency reliability and factor structure of the measurement instrument

To ascertain the internal consistency of the attitudinal component of the e-HRM measurement instrument and the six attitudinal subscales, the Cronbach’s alpha reliability coefficient was calculated for the overall scale and the corresponding subscales that were developed to measure attitudes towards e-HRM tools. Due to the low reliability obtained for three of the subscales, the structure of the e-HRM measurement instrument was assessed, using exploratory factor analysis. Field (2005) states that factor analysis is an excellent statistical technique for the investigation of the underlying structure of a questionnaire. Factor analysis is especially useful when the purpose is to uncover the underlying dimensions in a questionnaire. Those items that refer to the same dimension or share the same dimension, should correlate highly with one another. Factor analysis uses this to uncover those factors or dimensions.

Catell’s scree test was used to study the slope of the plotted *eigenvalues* in order to determine the factor solution. The *eigenvalue* (Kaiser’s criterion) for a given factor measures the variance in all the variables explained by that factor. If a factor has a low *eigenvalue,* then it is contributing little to the explanation of variance in the variables and

may be considered as redundant. Kaiser's criterion has been criticised for resulting in the retention of too many factors; therefore, Catell's scree test is used to clearly determine the number of factors to use. The scree test shows a sharp drop levelling off to a flat tail as each successive component's *eigenvalue* explains less and less of the variances. The Catell rule is to pick all factors prior to where the plot levels off or changes (Field, 2005).

Factor rotation is used to present the pattern of loadings in a manner that is easier to interpret. The factor solutions were rotated obliquely according to the Promax criterion to obtain interpretable solutions. The Promax oblique rotation results in several factor solution matrices, of which the so-called factor pattern solution matrix is the more important (Field, 2005), and is reported in the present study. The values in these factor pattern solution matrices are called factor loadings and give the regression of the items on the factors. These regression coefficients will also be referred to as factor loadings.

The groups of items that loaded highest on each factor were assessed for meaningful content and assigned headings. After analysis of the Corrected Item-Total Correlations of the items that comprise the three revised factors, and the removal of the items that were not considered to be reliable, the factors were converted to subscales. Seven items were negatively worded and as a result needed to be reverse-coded. Following this, the subscales were computed by obtaining a composite score of all the items retained within each factor and dividing by the total number of items in each factor. A total score for the tool was obtained by computing an aggregate score for the total number of items in the questionnaire.

After the factors were created, the correlations between them were compared using a Pearson's product-moment correlation to determine the nature of the relationship between the subscales. Correlation scores indicate the degree to which two variables assess the same construct, and vary between +1,00, which can be considered a perfect positive correlation, and –1,00, which indicates a perfect negative correlation. A score at

or close to 0,00 indicates no or very little correlation between scores (Field, 2005). Two factors were found to correlate perfectly (r = 1,00), indicating that the two subscales measure the exact same criteria. It was decided to abandon the third factor in the analysis of the hypothesis of the study. The total score and the two remaining subscales demonstrate a good internal consistency and therefore appear to reliably measure attitudes towards e-HRM tool usage with the present sample.

3.5.3 E-HRM tool usage

Differences between groups with regard to preference for tool usage were assessed using Pearson's Chi-Square tests for both occupational and demographic characteristics of respondents. All the variables involved in this section of the analysis are categorical variables; therefore, Pearson's Chi-Square is the best measure to test for significant differences between groups on tool usage preferences (Field, 2005). Effect size was calculated using Cramer's V which is constrained to fall between 0 and 1, therefore easily interpretable (Field, 2005). Cramer's V values that are close to 0,5 are considered to be a large effect, 0,3 constitutes a medium effect and 0,1 constitutes a small effect (Field, 2005).

3.5.4 Testing of hypotheses

3.5.4.1 Differences between demographic characteristics and attitudes towards e-HRM

The differences in demographic characteristics and attitudes towards e-HRM tool usage were assessed by examining differences between variations of the variables; gender, age, race and qualifications of the respondent. To explore whether there were any significant differences for gender on the measurement instruments, an independent samples t-test was conducted. In order to assess the differences in attitudes for race, age groupings and qualifications, a one-way analysis of variance (ANOVA) was used.

The *post hoc* Scheffe test was used to control the likelihood of a type 1 error and to indicate where the specific areas of difference lie.

3.5.4.2 The relationship between occupational characteristics and attitudes towards e-HRM

The hypothesis that there would be a difference in overall attitudes towards e-HRM tool usage, depending on the job level, role or position in the company and number of years with the company, was assessed using a one-way analysis of variance. To determine whether there were differences with regard to the first and second factor, the same analysis was conducted on the subscales of the questionnaire. The *post hoc* Scheffe test was used in order to determine the likelihood of a type 1 error and to indicate where the specific areas of difference lie.

3.5.4.3 The relationship between preference for e-HRM tool usage versus manual processes and attitudes towards e-HRM tools

The hypothesis that respondents who were users of e-HRM tools compared to those who were overall non-users would differ in their attitudes towards e-HRM tool usage, also was assessed using a one-way analysis of variance on the total as well as subscales of the measurement instrument. The *post hoc* Scheffe test was again used in order to determine the likelihood of a type 1 error and to indicate where the specific areas of difference lie.

Users of e-HRM tools were also assessed within each of the different HR processes. As some of the user groups for each of the processes consisted of small sample sizes, groups with less than 5 respondents were excluded from the analysis. This resulted in the use of an independent samples t-test examination of the recruitment process scores, as only respondents who used e-HRM tools and respondents who used manual processes were compared for this scale. Results are presented using means and standard deviations on the total scale and subscales, and significant differences between groups are presented using line and bar graphs.

3.6 CHAPTER SUMMARY

In this chapter, the methodology and analysis of this research was discussed. The sample that was used in the research was described and the procedure used to obtain the sample, was discussed. The statistical methods that were used to analyse the data and the relationship among variables were also described.

The results of the analysis will be presented in the following chapter.

CHAPTER 4 RESEARCH RESULTS

4.1 INTRODUCTION

The aim of chapter 4 is to present the findings of the empirical study. The following statistical techniques were applied, using the Statistical Package for the Social Sciences (SPSS) computer program for Windows, version 16.0.

The purpose of this study was to explore the attitudes towards e-HRM tools of human resource professionals and line managers, and also to determine whether the demographic qualities of the respondents and the types of HRM processes used, affect these attitudes. The population and sample of the study were discussed in chapter 3.

The demographic profile of the respondents is discussed in the first section of this chapter. The sample demographics were obtained using analysis of the frequencies of respondents in each of the demographic categories: age, gender, race, qualification, level, occupational position or role, and number of years with the company.

The next section of the chapter examines the reliability of the attitudinal measure towards e-HRM usage. The reliability of the total scale and the six dimensions of the questionnaire are examined first. Following this, the factor structure of the questionnaire is examined and three new subscales are created that reliably measure attitudes towards e-HRM processes.

This is followed by an overview of the tools preferred by respondents to manage the different HR processes, whether manually or through the use of an electronic human resource management (e-HRM) tool. Respondents were also divided into three groups with regard to overall preference for tool usage on total HR processes. This total preference as well as the preferences for tool usage for each of the separate HR processes will be examined to determine whether there are any demographic differences in preference for tool usage, and if, as a result, any demographic variables need to be controlled in the remainder of the analysis.

The fourth section of the chapter examines the results of the hypotheses of the study.

4.2 RESEARCH CONTEXT

This study was conducted at a large South African bank ("the Bank"). The structure of the organisation in which the research was conducted is highly decentralised with an 'owner-manager' culture. The organisation is split into eight separate segments. A segment can be seen as a division within the Bank.

Each segment consists of many business units. Each segment has a Chief Executive Officer (CEO), a Chief Financial Officer (CFO) and a head of HR, and each business unit falling in the segments also has a CEO and a head of HR. As such, many of the organisational functions will vary from segment to segment and even from business unit to business unit.

Another factor to consider is that a new enterprise resource planning (ERP) system with various e-HRM modules is to be implemented within the next 18 months, and there is great hesitation to buy or develop new e-HRM technology for this period.

4.3 SAMPLE DEMOGRAPHICS

The next section includes a discussion of the occupational characteristics and the biographical characteristics of the sample, followed by an interpretation of the key findings.

TABLE 4.1 SAMPLE DEMOGRAPHICS

Sample Demographics			
OCCUPATIONAL DEMOGRAPHICS			
		Frequency (N)	Percentage (%)
Position/Role	HR	55	52,9
	Line Management	33	31,7
	Other	16	15,4
Level	Junior	9	9,0
	Middle	33	33,0
	Senior	38	38,0
	Executive	20	20,0
Years at the Bank	Less than 1 yr	9	8,7
	1-4 yrs	24	23,3
	5-9 yrs	27	26,2
	10-20 yrs	25	24,3
	20 + yrs	16	15,5
BIOGRAPHICAL DEMOGRAPHICS			
Qualification	Matric	7	6,9
	Diploma	14	13,7
	Degree	25	24,5
	Honours	30	29,4
	Masters	22	21,6
	Other	4	3,9
Age	18-28 yrs	9	8,7
	29-39 yrs	51	49,5
	40-50 yrs	35	34,0
	51-61 yrs	7	6,8
	61 + yrs	1	1,0
Gender	Female	57	57,0
	Male	43	43,0
Race	African	15	14,7
	White	69	67,6
	Indian	11	10,8
	Coloured	7	6,9
	Other	0	0,0

4.3.1 Occupational characteristics of the sample

The sample consisted of 104 respondents who were all employees within the same organisation, a large financial institution. The majority of the sample consisted of employees who filled an HR position (53%), 33 (32%) were line managers and 16 (15%) were in other positions. Respondents ranged from junior staff, which formed the smallest subgroup (9%), to employees at executive level (20%).

4.3.2 Biographical characteristics of the sample

The sample consisted of slightly more females (57%) than males (43%), and white respondents formed the majority of the sample (68%). Most respondents were between the ages of 29 and 39 (50%), followed by 40 to 50 years (34%), 9% were under the age of 29, and only 8% were over the age of 51. The majority of respondents had tertiary qualifications (89%), and only 7% possessed only a matric certificate. Approximately 66% have been with the company for more than 5 years, whereas 23% have been with the company between one and four years and 9% for less than a year.

4.3.3 Interpretation of demographic profile of respondents

The above figures indicate key characteristics of the sample that should be considered when interpreting the research findings. Firstly, in terms of position, the majority of the sample was made up of HR professionals. Job level distribution indicates that most of the respondents (38%) were in a senior role. When analysing sample distribution pertaining to qualifications, individuals with an honours degree are most prevalent. The years of service indicate that the sample mainly represents individuals who have been at the organisation for between five and nine years; however, this is almost matched by the one to four year group and the 10 to 20 year group. It is also apparent that respondents between the ages of 29 and 39 account for the largest group in the sample. The sample also predominantly consists of females. White respondents constitute the majority of the sample.

One could summarise this by saying that the majority of the sample consists of white, female HR professionals who have completed an honours degree. This group have been at the organisation for between five and nine years, and are between the ages of 29 and 39.

The implications of the particular characteristics of the sample for the variables and the interpretation of the empirical results will now be briefly highlighted.

As previously mentioned, the HR role was most predominantly represented in the sample. This could be due to a number of reasons. Firstly, as the researcher is from the HR community, the majority of the researcher's networks extend to HR individuals. Secondly, the HR community is more likely to have exposure to e-HRM tools and would have a better understanding of the topic, and perhaps therefore be more willing to answer questions around it. HR professionals would also have a greater vested interest in the topic, as e-HRM tools are more likely to affect individuals from the HR community.

The majority of the sample was made up of individuals in a senior job level (38%). Those at executive level accounted for 20% of the sample, middle level 33%, and those individuals in junior levels made up 9% of the sample. This may be as a result of the sampling methodology employed, where networks and referrals were utilised extensively by the researcher and by senior HR practitioners who assisted in the distribution of the questionnaire.

The majority of respondents had tertiary qualifications. This accounted for 89% of the sample. This may be linked to the high number of respondents that fall into the senior role grouping. From Table 4.2 below it is clear that employees at a senior level within the organisation predominantly have an honours degree. 42% of employees at executive level report to have a degree.

TABLE 4.2 RESPONDENT QUALIFICATION BY JOB LEVEL

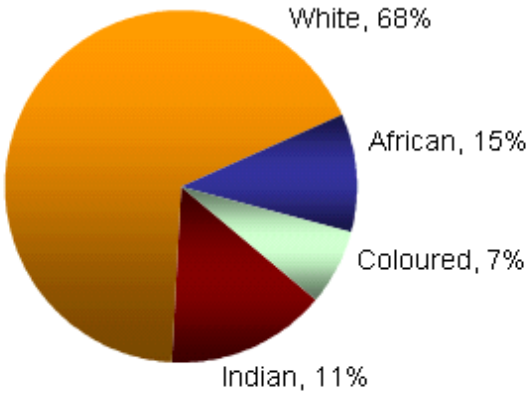
	Level									
Qualification	**Junior**		**Middle**		**Senior**		**Executive**		**Total**	
	N	%	N	%	N	%	N	%	N	%
Matric	2	22,20	3	9,70	2	5,60	0	0,00	7	7,40
Diploma	4	44,40	3	9,70	5	13,90	1	5,30	13	13,70
Degree	1	11,10	7	22,60	8	22,20	8	42,10	24	25,30
Honours	2	22,20	11	35,50	12	33,30	5	26,30	30	31,60
Masters	0	0,00	7	22,60	9	25,00	5	26,30	21	22,10
Total	9	100,00	31	100,00	36	100,00	19	100,00	95	100,00

The years of service section are fairly evenly split where the grouping of one to four years, five to nine years and 10 to 20 year groups are very similar. This demonstrates an even distribution in terms of years of service of the respondents.

The results further indicate that the majority of the respondents were quite young. 59% of respondents were under the age of 39. The largest group was made up of individuals between the ages of 29 and 39. This is indicative of hierarchies within organisations where the majority of the organisation will be made up of younger, more junior individuals, followed by mid-level employees in mid-age range, and a small percentage is made up of older, more senior individuals.

Gender frequency distribution highlighted that the majority of the respondents were female. As previously intimated, this could be due to the fact that the population within the organisation, and in particular in the HR field, is largely female. In recent years there has been an increase in the number of women in the human resource profession (Ulrich, Brockbank, Johnson & Younger, 2007). Ulrich et al. (2007) point out that in the last two decades, the percentage of woman in the human resource industry has increased from approximately 25% to more than 50%. They conclude that the reason for this may be as a result of more women entering the workforce and choosing roles in the HR profession.

Finally, when looking at the sample distribution according to race, white respondents make up a definite majority, accounting for 68% of the sample. This is demonstrated in Figure 4.1.



	N
African	15
White	69
Indian	11
Coloured	7
Missing	2
Total	104

Figure 4.1 Sample distribution by race

4.4 RELIABILITY AND FACTOR STRUCTURE OF THE MEASUREMENT INSTRUMENT

The following section evaluates the reliability and factor structure of the instrument developed to measure attitudes.

4.4.1 Initial assessment of the reliability of the subscales of the e-HRM attitudinal measure

To examine the reliability of the e-HRM attitudinal measure, estimates of internal consistency for the total scale and six subscales were obtained in terms of Cronbach's alpha coefficient. The overall e-HRM scale was found to be a reliable tool for analysis with the present sample, as it displayed a high Cronbach's alpha coefficient of 0,93. The subscales, however, yielded less consistent reliability scores. For example, the first three subscales had acceptable Cronbach's alpha coefficients of above 0,7 – which is the standard cut-off for a reliable measure (Field, 2005). The last three subscales, however, which assessed aspects such as responsibilities for line managers, confidentiality and security, and the changing role of human resource professionals, yielded unacceptably low Cronbach's alpha coefficients ranging from 0,13 to 0,45.

Therefore, it was decided to conduct a factor analysis of the scales to determine whether alternative groupings of the items could yield more appropriate measures for further analysis of e-HRM processes in the present study.

TABLE 4.3 SCALE RELIABILITIES (CRONBACH'S ALPHA COEFFICIENT)

Scale	N of items	α
The human resource professional as a strategic business partner	12	0,85
Human resource management service delivery	15	0,76
New skills required for human resource management	8	0,76
Human resource management responsibilities for line managers	8	0,45
Confidentiality and security, and e-HRM	4	0,13
Changing role requirement of human resource professionals	4	0,42
Total e-HRM scale	51	0,93

Total sample N= 104

4.4.2 Analysis of the factor structure of the e-HRM survey instrument

To examine the underlying factor structure of the e-HRM survey instrument, an exploratory factor analysis was conducted, using a principal axis factor analysis with an oblique promax rotation. Prior to performing the factor analysis, the suitability of the data for factor analysis was assessed. The correlation matrix revealed a number of coefficients of 0,30 and above. The Kaiser-Mayer-Oklin value was 0,73 – which exceeded the recommended value of 0,60 (Field, 2005). The Bartlett's Test of Sphericity was statistically significant (p = 0,000). The data was therefore considered suitable for a factor analysis.

The initial *eigenvalues* were inspected to determine the number of factors to use for the factor analysis. Initial *eigenvalues* with a total value higher than 1,0 indicate a strong extraction (Field, 2005); therefore, all factors with *eigenvalues* below 1,0 were not reported in the results and can be seen as insignificant. Nine factors were found to have *eigenvalues* (Kaiser Criterion) exceeding 1,0 (see Table 4.4). This nine-factor model accounts for 60,78% of the total variance. Inspecting Catell's scree test revealed that the

graph levelled off at the third factor (see Figure 4.2). Taking into account that the first three factors each has an *eigenvalue* greater than 2,0 and that they explain more variance than the remaining factors, it was decided to retain these three factors for further investigation.

TABLE 4.4 TOTAL VARIANCE EXPLAINED FOR THE E-HRM ATTITUDINAL MEASURE BEFORE EXTRACTION (EXCLUDING FACTORS WITH EIGENVALUES LOWER THAN 1,0)

Total Variance Explained

	Initial *Eigenvalues*			Extraction Sums of Squared Loadings		
Factor	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	15,524	30,439	30,439	15,233	29,869	29,869
2	4,106	8,050	38,490	3,787	7,426	37,295
3	2,830	5,549	44,039	2,473	4,848	42,144
4	2,300	4,511	48,550	1,947	3,818	45,962
5	2,136	4,189	52,739	1,825	3,578	49,540
6	1,992	3,905	56,644	1,703	3,339	52,879
7	1,883	3,692	60,336	1,581	3,100	55,978
8	1,623	3,183	63,518	1,299	2,548	58,527
9	1,458	2,859	66,377	1,150	2,254	60,781

Extraction Method: Principal Axis Factoring

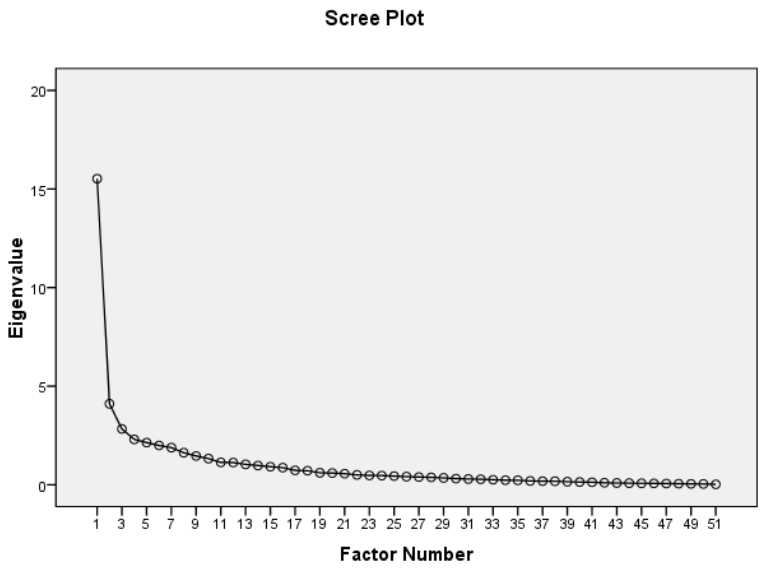


Figure 4.2 Scree plot for the e-HRM attitudinal measure

To aid in the interpretation of the three factors that were extracted, an oblique promax rotation with Kaiser normalisation was performed. The three-factor solution explained a total of 41% of the variance (see Table 4.5). Table 4.5 displays the rotated pattern matrix which indicates the distribution amongst the three factors. Pattern matrixes (see Appendix 1) show the unique relationships of items to factors, and loadings represent the direct effects of factors on items (Field, 2005).

TABLE 4.5 TOTAL VARIANCE EXPLAINED FOR THE E-HRM ATTITUDINAL MEASURE AFTER EXTRACTION (EXCLUDING FACTORS WITH *EIGENVALUES* LOWER THAN ONE)

Total Variance Explained

	Initial *Eigenvalues*			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	15,524	30,439	30,439	15,003	29,417	29,417	14,200
2	4,106	8,050	38,490	3,520	6,902	36,318	9,607
3	2,830	5,549	44,039	2,206	4,326	40,644	3,140
4	2,300	4,511	48,550				
5	2,136	4,189	52,739				
6	1,992	3,905	56,644				
7	1,883	3,692	60,336				
8	1,623	3,183	63,518				
9	1,458	2,859	66,377				

Extraction Method: Principal Axis Factoring

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Factor loadings greater than 0,30 were considered sufficient to assume a strong relationship between a variable and a factor (Field, 2005). Two items had factor loadings of less than 0,30; however, as these were all above 0,25 it was decided not to exclude these items from the factor structure. A number of items loaded negatively on the factors; however, on examination of the wording of the items it was evident that the questions were worded negatively and therefore implied positive association with e-HRM tool.

After the factor analysis was performed, a score was calculated for each factor by obtaining the mean for all items comprising each factor. Although some items loaded

above 0,30 on more than one item, the items were not allowed to cross-load in the development of the subscales, and were retained with the factors that they loaded the highest on.

The first factor accounted for 14,2% of the total scale variance after rotation of the factors, and consists of items such as “e-HRM information and decision-support tools enable better strategic HR decisions” and “Enhanced reporting is facilitated by e-HRM tools”. The first factor will therefore be referred to as “improved HR information and strategic service delivery” – as the majority of the items refer to strategic use of e-HRM information and the application of this information to direct strategic HR initiatives. The second factor accounted for 9,61% of the total scale variance and contains items such as “HR services have been streamlined and standardised using information technology” and “The use of e-HRM tools has led to the automation of routine HR work”. Factor two will be referred to as “Improved personal efficiency and organisational effectiveness”, as the majority of the items refer to improved efficiency and effectiveness supported by e-HRM. The third factor accounted for only 3,14% of the total scale variance. The items in this factor seem to relate closely to the items in the second factor, and therefore the suitability of retaining this factor will be discussed in the next section. These three factors will be used in the remainder of the study as three subscales of the e-HRM attitude tool. For the remainder of the chapter, the three revised factors will be referred to as factor 1, factor 2 and factor 3.

4.4.3 Reliability of the revised subscales

The revised factor 1 consisted of 33 items and was found to have a high Cronbach’s alpha coefficient of 0,94. On examination of the item-total correlations, it was found that two items on this scale (namely “E-HRM information and decision-making tools restrict my ability to make decisions” and “HR should continue to take responsibility for HR transactions”) had a low corrected item-total correlation (r = 0,29 and r = 0,19 respectively); however, as the overall reliability is high and the removal of these items does not increase the overall reliability of the subscale, these items will be retained. Two

items in this factor (namely “More staff members are required when using e-HRM tools” and “E-HRM information and decision-making tools restrict my ability to make decisions”) were negatively worded and were therefore reverse-coded prior to analysis of the factor. The subscale was calculated by obtaining the sum of the mean of the 32 remaining items, as described in Appendix 2.

The second factor consisted of 13 items and was found to have a high Cronbach’s alpha coefficient of 0,87 – that is well above the recommended 0,70 (Field, 2005). None of the items on this scale had low corrected item-total correlations, nor was there need to reverse-code any items. The second subscale was calculated by obtaining the sum of the mean of the 13 items, as described in Appendix 3.

The third factor had a lower internal consistency with a Cronbach’s alpha coefficient of 0,55. This factor consisted of the largest number of reverse-coded questions, which may explain the low reliability as people may have misinterpreted the question. All of the items in this scale except for one (namely “Current e-HRM tools provide robust security to protect data from unauthorised access or alteration) were reverse-coded prior to analysis with the scale. Two items had low corrected item-total correlations below the recommended level of r = 0,3 (Field, 2005), namely “Implementation of e-HRM tools has required me to update my business knowledge”, which had a correlation of 0,213, and “HR specialists (e.g IR Manager, Remuneration Specialist) are still the dominant HR service delivery method”, which had a correlation of 0,112. After removal of these items, the reliability of the scale increased to a satisfactory 0,62. Factor 3 was calculated by obtaining the sum of the mean of the 4 remaining items, as described in Appendix 4.

After the factors were defined, the relationships between the factors were investigated using Pearson’s product-moment correlation coefficient. Preliminary analysis was performed to ensure that there were no violations of the assumptions of normality, linearity and homoscedasticity. Table 5.6 presents the correlation matrix for the correlations between the three subscales and the subscales with the total scale score.

TABLE 4.6 PEARSON'S CORRELATION MATRIX FOR CORRELATIONS BETWEEN THE THREE SUBSCALES AND TOTAL SCALE

		Correlations[a]			
		Total e-HRM scale	**FACTOR 1**	**FACTOR 2**	**FACTOR 3**
Total e-HRM scale	Pearson Correlation	1,000	0,940**	0,753**	0,753**
	Sig. (2-tailed)		0,000	0,000	0,000
FACTOR 1	Pearson Correlation	0,940**	1,000	0,513**	0,513**
	Sig. (2-tailed)	0,000		0,000	0,000
FACTOR 2	Pearson Correlation	0,753**	0,513**	1,000	1,000**
	Sig. (2-tailed)	0,000	0,000		0,000
FACTOR 3	Pearson Correlation	0,753**	0,513**	1,000**	1,000
	Sig. (2-tailed)	0,000	0,000	0,000	

** Correlation is significant at the 0,01 level (2-tailed).

a. Listwise N =104

All the subscales were significantly correlated in a positive direction, indicating that high scores on any of the subscales are associated with high scores on the remaining scales. A concern is that the third factor correlates perfectly with the second factor, indicating that the two subscales measure exactly the same criteria. The two factors also have exactly the same correlation with the total scale. As the third factor explains such a low percentage of the variance, compared to the first two factors, and the sample size used for the factor analysis is lower than the recommended 250 respondents (Hair, Anderson, & Tatham, 1995), there is a need for future studies with larger samples to attempt to replicate the structure of the questionnaire and either confirm the three-factor structure identified in the present study or find validity for the original six dimensions used in the questionnaire. Future studies with larger samples are also required to determine whether a two-factor structure would not be more appropriate to the scale, or if the items in the third factor should be omitted from the questionnaire entirely. On the basis of these concerns, it was decided to abandon the third subscale for the analysis of the hypothesis of the study.

4.5 E-HRM TOOL USAGE

Respondents' preferences for types of tools used for the different HR processes were examined for each of the HR processes and also at a total preference for tool usage level. Total preference was obtained by examining the frequency of preference for either tool within each of the HR processes for every respondent. Respondents who preferred e-HRM tools to manual tools for more than 50% of the HR processes were labelled as overall e-HRM users, whereas respondents who preferred manual tools for more than 50% of the time were labelled manual users. Respondents who preferred both processes equally were labelled equal users, and respondents who did not use either tool were excluded from the computation.

The majority of the sample consisted of respondents who preferred to use manual tools for 65% of HR processes (definition of user adopted for the present study), whereas 22% preferred e-HRM tools and 13% preferred both equally. These findings are shown in Figure 4.3 below.

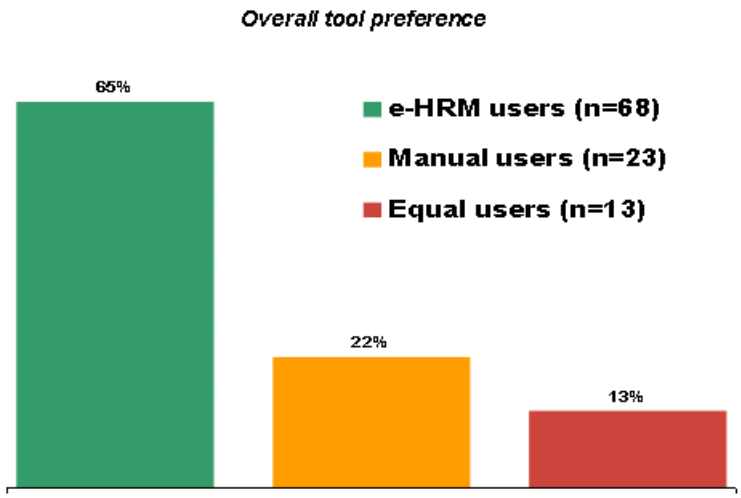


Figure 4.3 Tool usage preference for total sample

Overall tool preference, that is, whether the respondent preferred conducting HR processes manually, using e-HRM tools or using a combination of manual and e-HRM practices, was examined against the roles that these individuals held. One of the most

striking results is that there is a large difference between HR as an e-HRM user (65%) and line management as an e-HRM user (22%). In terms of manual usage (49%) and equal usage (54%), HR is also seen to utilise both these practices more than line management does.

TABLE 4.7 VARIATIONS IN TOOL USAGE ACCORDING TO ROLE

		Position / role		
		HR	**Line Management**	**Other**
		%	%	%
Total tool preference	Manual users	48,50	33,80	17,60
	e-HRM users	65,20	21,70	13,00
	Equal users	53,80	38,50	7,70

4.5.1 Variations in e-HRM tool usage according to the occupational characteristics of the sample

Differences with regard to preference for tool types on total HR processes as well as the different types of HR processes were assessed using Pearson's Chi-Square test (see Appendix 5). Occupational characteristics which were examined for differences in preferences for tool usage were the 1) respondent's position, 2) job level and 3) years at the company. The segment category was not analysed due to the small number of people in some of the cells. No significant differences were found between these groups on total tool preference. With regard to the individual HR processes, only two significant differences were found. There was a significant difference in preference for tool usage when conducting performance management processes and the number of years a respondent has been with the company [$X^2(8) = 15{,}68$, $p = 0{,}047$]. Cramer's V, however, was 0,28 – which indicates only a moderate effect size. This will be discussed further in section 4.5.3.4.

The position or role of the respondent also resulted in significant differences with regard to preference for tool usage on compensation and benefits processes [$X^2(4) = 10,25$, $p = 0,036$] and recruitment and selection [$X^2(4) = 10,25$, $p = 0,043$]. Cramer's V for these two findings was 0,241 and 0,225 respectively, which implies a low to moderate effect size. In both processes, HR is more inclined to use the e-HRM tool than line management or other roles.

TABLE 4.8 VARIATIONS IN RECRUITMENT AND SELECTION PROCESSES AND ROLE AT COMPANY

		Position/Role							
		Total		**HR**		**Line Management**		**Other**	
		N	%	Count	%	Count	%	Count	%
Recruitment and selection	Manual Process	45	44,6	17	32,1	19	57,6	9	60,0
	Use e-HRM tool	49	48,5	32	6,.4	12	36,4	5	33,3
	Both	3	3,0	3	5,7	0	0,0	0	0,0
	None	4	4,0	1	1,9	2	6,1	1	6,7

4.5.2 Variations in e-HRM tool usage according to the demographic characteristics of the sample

Demographic characteristics of respondents that were assessed include age, gender, race and qualifications of the respondent.

Significant age differences were found on two processes: training and development [$X^2(6) = 17,48$, $p = 0,008$] and performance management [$X^2(6) = 17,48$, $p = 0,008$]. Cramer's V is moderate in both situations ($r = 0,294$ and $r = 0,299$ respectively). Gender differences were apparent on recruitment and selection [$X^2(2) = 17,57$, $p = 0,000$] and Cramer's V indicates a strong effect size ($r = 0,432$).

None of the occupational or demographic differences found for tool usage preference with regard to the different HR processes had a high effect sizes larger than 0,5;

therefore, it was decided not to control for any of the potential effects of these differences on further analysis with the tool. It should also be noted that the cell size for respondents who used both tools equally or no tools, is also small (often less than 5 respondents per cell); therefore, any inferences made regarding differences on these two preference options between groups should be made with extreme caution (Field, 2005).

4.5.3 Interpretation of e-HRM tool usage

In this section, an interpretation of overall e-HRM tool usage, e-HRM tool usage in terms of occupational characteristics, and e-HRM tool usage in terms of demographic characteristics will be discussed.

4.5.3.1 Overall e-HRM tool usage

As mentioned before, overall, 65% of respondents utilised manual HR processes, 22 % used e-HRM processes, and 13% were equal users in that they used manual and e-HRM processes equally. The organisation in which the research was conducted is considered to be transitioning from the transactional to the automation stage in e-HRM development. Lengnick-Hall and Moritz (2003) highlight the reasons why an organisation would be in a particular stage in e-HRM development, namely organisational maturity, availability and access to personal computers, number of human resource professionals, and information technology specialists.

With this context in mind, one can understand why the majority of the respondents utilise manual HR processes. The organisation is in a transitional period where there is a slow, incremental movement towards adopting information technology for human resource management purposes. There are not many centralised HR services in the organisation yet. Each segment and, in many cases, each business unit would decide for itself what would be appropriate in terms of HR process – whether through a manual process or utilising e-HRM. This is confirmed in the literature. In an article by Lengnick-Hall and

Moritz (2003), the authors confirm that in many organisations, HR will combine old, traditional HR processes with new technology.

4.5.3.2 Variations in e-HRM tool usage according to the occupational characteristics of the sample

When the differences regarding preference for tool types was examined for the different occupational characteristics of the sample, no significant differences were found on the total tool preference. However, when individual HR processes were investigated, two significant differences were found. This is shown in Table 4.9

TABLE 4.9 VARIATIONS IN PERFORMANCE MANAGEMENT PROCESS AND NUMBER OF YEARS AT COMPANY

		Years at the Bank				
		Less than 1 yr	1-4 yrs	5-9 yrs	10-20 yrs	20 + yrs
		%	%	%	%	%
Performance management	Manual process	37,5	75,0	44,4	64,0	64,3
	Use e-HRM tool	50,0	25,0	55,6	24,0	35,7
	Both	12,5	0,0	0,0	12,0	0,0
	None	0,0	0,0	0,0	0,0	0,0

There was a significant difference in preference for e-HRM tool usage when conducting performance management processes, and the number of years a respondent has been with the company. It appears that respondents who have been with the company between five and nine years are more comfortable with using e-HRM processes, whereas newer employees may still prefer manual processes, and employees who have been with the company for more than 10 years may be more set in their ways and therefore be reluctant to use newer e-HRM tools for HR processes.

The second significant finding related to the position or role of the respondent with regard to preference for using e-HRM tools for compensation and benefits processes or for recruitment and selection. For both these processes, HR is inclined to utilise e-HRM tools more than line management and others. It could be interpreted that HR would be

more familiar with the internal and external recruitment websites, as they would be required to advertise on the websites and shortlist from these applications, whereas line management would receive applications from HR and do their own shortlisting manually, based on interviews and review of curriculum vitaes. Compensation and benefits administration is generally prepared by HR administrators who would input employee information regarding benefits and compensation onto the payroll system. Line management, with the assistance of more senior HR professionals, would make decisions on appropriate compensation and remuneration through manual means, by referring to broad-banding definitions, role profiles and salaries of employees in similar roles.

4.5.3.3 Variations in e-HRM tool usage according to the biographical characteristics of the sample

On the age demographic, two moderately significant differences where found for training and development processes and performance management. For the training and development process, all age groups, except for the 51-61 year grouping, mainly utilised e-HRM tools for this process. This could be attributed to the extensive online training programmes available to staff through the organisation's self-service portal. For certain roles there is organisation specific training which an employee must complete. Employees can register online for training and, once approved by management, can receive online training.

The second moderately significant finding refers to performance management in terms of the age demographic and how individuals prefer to conduct HR processes. The majority of the sample preferred to use manual processes. This is the same for the total sample. An interesting finding is that for the 51+ age grouping, respondents either used manual processes for performance management or a combination of manual and e-HRM tools. In the other groups, there is a distinction: respondents either used an e-HRM tool, or used manual processes only. These findings give a picture of e-HRM tool usage development. For the younger groups, including the 18 to 28 age group, the 29 to 39 age group, and the 40 to 50 age group, respondents are definite in their tool usage

preference – which may be due to being comfortable with the chosen tool usage type and greater confidence in using information technology supported tools. In the more mature 51 + group, the proportion using manual processes is greater. This could suggest a reluctance to use newer technologies for this process.

TABLE 4.10 VARIATIONS IN TRAINING AND DEVELOPMENT AND PERFORMANCE MANAGEMENT PROCESSES AND AGE

		Age									
		18-28 yrs		29-39 yrs		40-50 yrs		51-61 yrs		61 + yrs	
		N	%	N	%	N	%	N	%	N	%
Performance management	Manual process	5	55,6	31	60,8	20	58,8	3	60,0	1	100,0
	Use e-HRM tool	4	44,4	18	35,3	14	41,2	0	0,0	0	0,0
	Both	0	0,0	2	3,9	0	0,0	2	40,0	0	0,0
	None	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
Training and development	Manual process	1	11,1	19	37,3	4	11,8	3	60,0	0	0,0
	Use e-HRM tool	7	77,8	31	60,8	25	73,5	1	20,0	1	100,0
	Both	0	0,0	0	0,0	5	14,7	1	20,0	0	0,0
	None	1	11,1	1	2,0	0	0,0	0	0,0	0	0,0

The qualification of the respondent appears to impact tool usage preferences for recruitment and selection processes [$X^2(10) = 20,56$, $p = 0,024$] and employee or labour relations processes [$X^2(10) = 29,35$, $p = 0,001$]. Cramer's V in both these situations indicates a moderate to high effect size ($r = 0,329$ and $r = 0,420$ respectively). There were no differences with regard to tool usage preferences by race.

TABLE 4.11 VARIATIONS IN EMPLOYEE/LABOUR RELATIONS AND RECRUITMENT AND SELECTION PROCESSES AND QUALIFICATION

		Qualification											
		Matric		Diploma		Degree		Honours		Masters		Other	
		N	%	N	%	N	%	N	%	N	%	N	%
Recruitment and selection	Manual process	1	16,7	8	57,1	11	45,8	10	33,3	13	61,9	2	50,0
	Use e-HRM tool	5	83,3	5	35,7	11	45,8	19	63,3	7	33,3	1	25,0
	Both	0	0,0	0	0,0	0	0,0	0	0,0	1	4,8	1	25,0
	None	0	0,0	1	7,1	2	8,3	1	3,3	0	0,0	0	0,0
Employee / Labour relations	Manual process	6	100,0	12	85,7	19	79,2	23	85,2	14	66,7	2	50,0
	Use e-HRM tool	0	0,0	0	0,0	2	8,3	2	7,4	2	9,5	0	0,0
	Both	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	1	25,0
	None	0	0,0	2	14,3	3	12,5	2	7,4	5	23,8	1	25,0

A significant difference was found regarding gender and recruitment and selection. Research suggests that in general, women are less inclined than men to utilise IT systems (Hoxmeier, Nie & Purvis, 2000). The current study does not support the findings of the research conducted by Hoxmeier et al. (2000). There is evidence that almost 70% of women utilised e-HRM tools for recruitment and selection, whereas a mere 24% of men utilised e-HRM tools for this purpose. The reason for this finding is unclear. It may suggest that more women are in roles that focus on recruitment and selection; however, this cannot be substantiated with the available data.

TABLE 4.12 VARIATIONS IN RECRUITMENT AND SELECTION PROCESSES AND GENDER

		Gender			
		Female		Male	
		N	%	N	%
Recruitment and selection	Manual process	16	28,6	29	69,0
	Use e-HRM tool	37	66,1	10	23,8
	Both	1	1,8	1	2,4
	None	2	3,6	2	4,8

There is a moderate to high effect of qualification on recruitment and selection processes and employee or labour relations processes. Those with a Matric qualification are most inclined to utilise e-HRM tools for recruitment and selection processes. It would seem that the reliance on e-HRM tools decreases as the level of qualification increases. One could also assume that this is due to an increased need to refer to an HR manual, policies and guidelines by those that have not been trained in this specific HR process.

In terms of employee or labour relations, the majority of the sample, regardless of qualification, predominantly utilise manual processes. Within the Bank, matters regarding employee or labour relations are generally referred to the industrial relations department, who would advise on correct processes and procedures. It is probable that e-HRM tools are only used to capture basic industrial relations results. This actual employee or labour relations process requires much face-to-face consultation in the form of conducting or chairing disciplinary or grievance hearings, and this would usually be dealt with by individuals who are suitably qualified in either labour law or industrial psychology.

There were no differences with regard to tool usage preferences by race. This finding can be linked to a study conducted by Bawa, Jantan and Ali (cited in Wan Hooi, 2006), who found that demographic characteristics including race, did not have a significant impact on the implementation of strategic HR practices, including the use of e-HRM.

4.6 HYPOTHESES

The following section of the chapter examines the hypotheses of the study.

The first hypothesis (H_1) that HR professionals would have a greater preference for utilising e-HRM tools than line management or other groups was addressed in section 4.5.1. No significant differences were found between these groups on total tool preference and therefore this hypothesis was rejected.

4.6.1 Differences between biographical characteristics and attitudes towards e-HRM

The differences in demographic characteristics and attitudes towards e-HRM tool usage were assessed by examining differences between variations of the variables: gender, age, race and qualifications of the respondent. To explore whether there were any significant differences for gender on the measurement instrument, an independent samples t-test was conducted. To assess the differences in attitudes for race, age groupings and qualifications, a one-way analysis of variance (ANOVA) was used. The *post hoc* Scheffe test was used to control the likelihood of a type 1 error and to indicate where the specific areas of difference lie.

No significant differences on the total e-HRM attitude score or the two subscales were found between genders or qualifications of respondents. At first glance, it appears that there is a significant difference by race on the total e-HRM scale; however, analysis of the *post hoc* Scheffe test did not reveal any significant differences between groups, and the effect size of the result is weak (eta squared = 0,057). Pearson's correlation coefficient was used to examine the relationship between age and attitudes towards e-HRM tools, and no significant relationship was found. It therefore appears that demographic variables do not have a significant impact on attitudes towards e-HRM tools and therefore the hypothesis (H_2) is not supported.

This finding is in line with the conclusions drawn from a study conducted by Voermans and Van Veldhoven (2007), who also reported that respondents' attitudes towards e-HRM was not influenced by their age, gender, knowledge of IT or job experience. This is also supported by the study conducted by Gardner et al. (2003), who see gender, age and functional orientation as moderating factors in investigating the use of information technology for human resource purposes. Their research revealed that these demographic characteristics did not have any significant effect on information technology usage.

TABLE 4.13 ATTITUDES TO E-HRM TOOLS BY GENDER OF RESPONDENTS

	Gender	N	Mean	Std. Deviation	Std. Error Mean	t-Test		Sig.
Total e-HRM scale	Female	57	3,64	0,37	0,05	t(98)=	0,593	0,555
	Male	43	3,59	0,46	0,07			
FACTOR1	Female	57	3,85	0,42	0,06	t(98)=	0,945	0,347
	Male	43	3,76	0,50	0,08			
FACTOR2	Female	57	3,27	0,54	0,07	t(98)=	-0,021	0,983
	Male	43	3,28	0,57	0,09			

TABLE 4.14 ATTITUDES TO E-HRM TOOLS BY RACE OF RESPONDENTS

		N	Mean	Std. Deviation	ANOVA		Sig.	Eta Squared
Total e-HRM scale	African	15	3,84	0,37	F(3,98)=	2,780	0,045	0,057
	White	69	3,56	0,41				
	Indian	11	3,59	0,47				
	Coloured	7	3,85	0,26				
	Total	102	3,62	0,41				
FACTOR1	African	15	4,01	0,36	F(3,98)=	1,980	0,122	0,069
	White	69	3,75	0,47				
	Indian	11	3,83	0,55				
	Coloured	7	4,06	0,37				
	Total	102	3,82	0,46				
FACTOR2	African	15	3,58	0,43	F(3,98)=	2,440	0,069	0,069
	White	69	3,23	0,53				
	Indian	11	3,10	0,79				
	Coloured	7	3,46	0,32				
	Total	102	3,28	0,55				

TABLE 4.15 ATTITUDES TO E-HRM TOOLS BY QUALIFICATIONS OF RESPONDENTS

		N	Mean	Std. Deviation	ANOVA		Sig.
Total e-HRM scale	Matric	7	3,5038	0,28341	F(4,93)=	0,355	0,840
	Diploma	14	3,6062	0,36130			
	Degree	25	3,6698	0,44598			
	Honours	30	3,6510	0,34363			
	Masters	22	3,5683	0,52615			
	Total	98	3,6203	0,41165			
FACTOR1	Matric	7	3,6495	0,35654	F(4,93)=	0,346	0,846
	Diploma	14	3,8381	0,43056			
	Degree	25	3,8642	0,49932			
	Honours	30	3,8350	0,40769			
	Masters	22	3,7752	0,56143			
	Total	98	3,8162	0,46421			
FACTOR2	Matric	7	3,1731	0,45086	F(4,93)=	0,432	0,785
	Diploma	14	3,2062	0,53483			
	Degree	25	3,3662	0,69808			
	Honours	30	3,3389	0,41369			
	Masters	22	3,2112	0,60986			
	Total	98	3,2864	0,55570			

TABLE 4.16 RELATIONSHIP BETWEEN ATTITUDES TO E-HRM TOOLS AND AGE OF RESPONDENTS

		Age
Total e-HRM scale	Pearson Correlation	0,038
	Sig. (2-tailed)	0,700
FACTOR1	Pearson Correlation	0,017
	Sig. (2-tailed)	0,868
FACTOR2	Pearson Correlation	0,027
	Sig. (2-tailed)	0,785

a. Listwise N =103

4.6.2 The relationship between occupational characteristics and attitudes towards e-HRM

The hypothesis that there would be a difference in overall attitudes towards e-HRM tool usage differ depending on the job level, role or position in the company and number of years with the company(H_3), was assessed using a one-way analysis of variance. To determine whether there were differences with regard to the revised factor 1 and factor 2, the same analysis was conducted on the subscales of the questionnaire (see Tables 4.17 to 4.19).

No significant differences on the total e-HRM attitude score or the two subscales were found for position or role of respondents, nor were any differences found for respondents by level or number of years with the company. As a result, the hypothesis that there would be significant differences in attitudes towards e-HRM tools depending on certain occupational variables (H_3) was not supported. As with biographical characteristics discussed in the above section, the study conducted by Voerman and Van Veldhoven (2007) supported this finding. They also found that the occupational characteristic of job level did not affect attitude towards e-HRM tools.

TABLE 4.17 ATTITUDES TO E-HRM TOOLS BY POSITION OR ROLE OF RESPONDENTS

		N	Mean	Std. Deviation	ANOVA		Sig.
Total e-HRM scale	HR	55	3,70	0,39	F(2,101)=	2,271	0,108
	Line Management	33	3,50	0,45			
	Other	16	3,62	0,37			
	Total	104	3,62	0,41			
FACTOR1	HR	55	3,90	0,44	F(2,101)=	2,110	0,127
	Line Management	33	3,69	0,49			
	Other	16	3,81	0,46			
	Total	104	3,82	0,47			
FACTOR2	HR	55	3,33	0,48	F(2,101)=	0,701	0,499
	Line Management	33	3,19	0,66			
	Other	16	3,29	0,52			
	Total	104	3,28	0,55			

TABLE 4.18 ATTITUDES TO E-HRM TOOLS BY LEVEL OF RESPONDENTS

		N	Mean	Std. Deviation	ANOVA		Sig.
Total e-HRM scale	Junior	9	3,7278	0,32763	F(3,96)=	0,915	0,437
	Middle	33	3,6634	0,38050			
	Senior	38	3,5403	0,39136			
	Executive	20	3,6759	0,52403			
	Total	100	3,6249	0,41249			
FACTOR1	Junior	9	3,8375	0,38514	F(3,96)=	0,579	0,630
	Middle	33	3,8807	0,46309			
	Senior	38	3,7362	0,44328			
	Executive	20	3,8280	0,56034			
	Total	100	3,8113	0,46786			
FACTOR2	Junior	9	3,5470	0,43345	F(3,96)=	2,116	0,103
	Middle	33	3,2424	0,48769			
	Senior	38	3,2116	0,48644			
	Executive	20	3,4804	0,57876			
	Total	100	3,3057	0,51085			

TABLE 4.19 ATTITUDES TO E-HRM TOOLS BY NUMBER OF YEARS WITH THE COMPANY

		N	Mean	Std. Deviation	ANOVA		Sig.
Total e-HRM scale	Less than 1 yr	9	3,714	0,31090	F(4,96)=	0,868	0,486
	1-4 yrs	24	3,612	0,50058			
	5-9 yrs	27	3,671	0,44413			
	10 -20 yrs	25	3,614	0,33464			
	20 + yrs	16	3,453	0,36782			
FACTOR1	Less than 1 yr	9	4,013	0,30857	F(4,96)=	1,109	0,357
	1-4 yrs	24	3,802	0,55010			
	5-9 yrs	27	3,862	0,50605			
	10 -20 yrs	25	3,799	0,37627			
	20 + yrs	16	3,632	0,43675			
FACTOR2	Less than 1 yr	9	3,239	0,57105	F(4,96)=	0,884	0,476
	1-4 yrs	24	3,240	0,69149			
	5-9 yrs	27	3,409	0,49830			
	10 -20 yrs	25	3,293	0,49028			
	20 + yrs	16	3,090	0,48022			

4.6.3 The relationship between preference for e-HRM tool usage versus manual processes and attitudes towards e-HRM tools

The hypothesis that respondents who were users of e-HRM tools, compared to those who were overall non-users, would differ in their attitudes towards e-HRM tools (H_4), was also assessed, using a one-way analysis of variance on the total as well as the subscales of the measurement instrument. The *post hoc* Scheffe test was again used in order to determine the likelihood of a type 1 error and to indicate where the specific areas of difference lie.

Significant differences were found between e-HRM users, manual users and equal users on the overall e-HRM attitude scale and also on the two subscales. Examination of the *post hoc* Scheffe test revealed that e-HRM users had significantly more positive attitudes towards e-HRM tools than manual users, on the total scale as well as the two subscales. The effect size using eta squared for all three findings was moderate to large, according to the guidelines proposed by Cohen (cited in Pallant, 2001), and therefore, these findings support the hypothesis (H_4) of the study.

The extent of the differences between e-HRM users, manual users and equal users in terms of attitude towards e-HRM tools, is further demonstrated in Figure 4.5, where one can see that on the total scale as well as factor 1 and factor 2, e-HRM tool users have more positive attitudes towards e-HRM tools than manual users and equal users. This may be due to the fact that individuals who make use of technology, are more familiar with actual programmes and different ways of using the tools. Therefore e-HRM users would be able to make use of technology to a larger extent. By realising the added benefits of using such technology, their attitudes towards the e-HRM tools would be more positive than those who do not have this exposure and knowledge of the advantages such tools could bring.

TABLE 4.20 THE RELATIONSHIP BETWEEN E-HRM TOOL USAGE AND ATTITUDES TO E-HRM TOOLS FOR OVERALL USAGE

		N	Mean	Std. Deviation	ANOVA		Sig.	Eta Squared
Total e-HRM scale	Manual users	68	3,5404	0,41923	F(2,101)=	4,448	0,014	0,081
	e-HRM users	23	3,8096	0,36633				
	Equal users	13	3,7323	0,34077				
	Total	104	3,6239	0,41268				
FACTOR1	Manual users	68	3,7413	0,48268	F(2,101)=	3,338	0,039	0,062
	e-HRM users	23	4,0146	0,39266				
	Equal users	13	3,9063	0,40794				
	Total	104	3,8224	0,46620				
FACTOR2	Manual users	68	3,1325	0,51589	F(2,101)=	8,012	0,001	0,137
	e-HRM users	23	3,5528	0,54635				
	Equal users	13	3,5621	0,43103				
	Total	104	3,2792	0,54730				

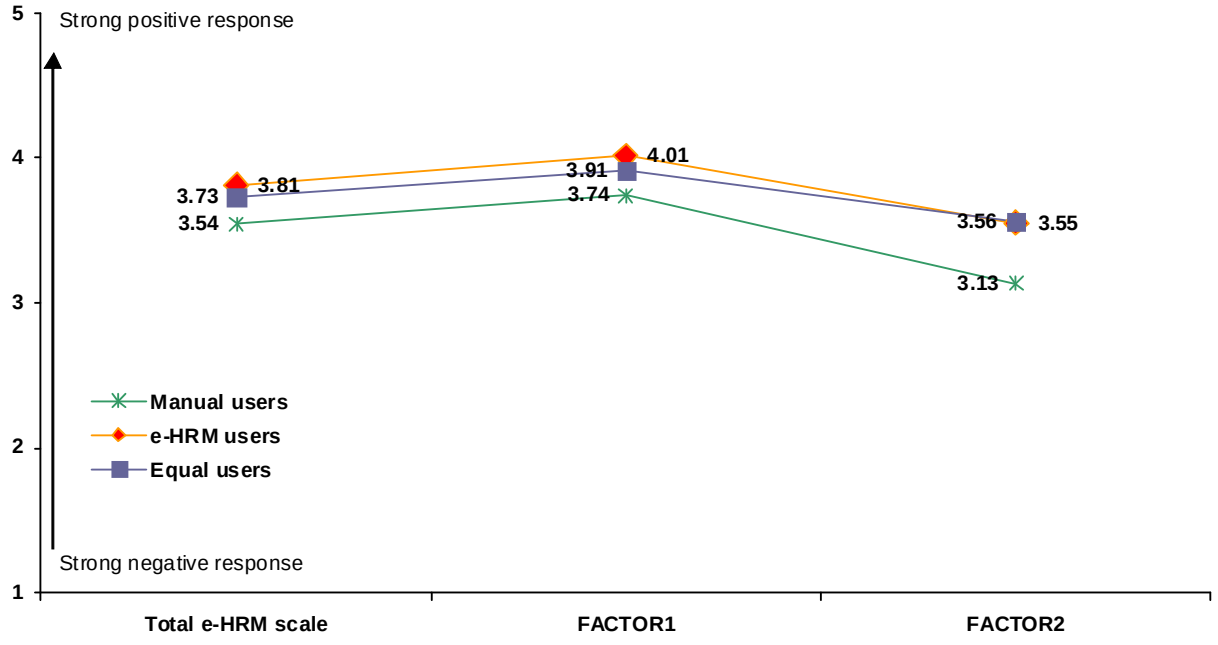


Figure 4.4 Mean scores for overall usage on the e-HRM attitude scale and subscales

4.6.4 The relationship between preference for e-HRM tool usage versus manual processes and equal usage, and attitudes towards e-HRM tools based on different HR processes

Users of e-HRM tools were also assessed within each of the different HR processes. As some of the user groups for each of the processes consisted of small sample sizes, groups with less than 5 respondents were excluded from the analysis. This resulted in the use of an independent samples t-test examination of the recruitment process scores, as only respondents who used e-HRM tools and respondents who used manual processes were compared for this scale.

Significant differences were found between the three groups on the overall e-HRM attitude scale for four of the HR processes under examination, namely performance management, affirmative action and BEE, employee and labour relations, strategic HR and HR planning. Significant differences were found on the first subscale for two of the processes: recruitment and selection, and strategic HR and HR planning, and on the second subscale for four HR processes: recruitment and selection, affirmative action and BEE, employee and labour relations, and strategic HR and HR planning. The effect size using eta squared for all the findings was moderate to large, according to the guidelines proposed by Cohen (cited in Pallant, 2001), and the effect is presented in Table 4.22.

Examination of the *post hoc* Scheffe test revealed that e-HRM users had significantly more positive attitudes towards e-HRM tools than manual users on most of the comparisons. These differences are indicated by arrows in Figures 4.6 to 4.8, and can also be seen in Tables 4.21 and 4.22.

TABLE 4.21 MEAN SCORES AND STANDARD DEVIATIONS FOR E-HRM USER GROUPS ACROSS THE DIFFERENT HR PROCESSES ON THE TOTAL SCORE AND SUBSCORES OF THE E-HRM ATTITUDE QUESTIONNAIRE

HR Process	Usage	N	Total e-HRM scale		Factor 1		Factor 2	
			M	SD	M	SD	M	SD
Performance management (e.g. Performax)	Manual process	60	3,51	0,41	3,71	0,47	3,11	0,53
	Use e-HRM tool	37	3,81	0,38	4,01	0,43	3,59	0,48
	Both	4	3,64	0,25	3,91	0,31	2,95	0,20
	None	0	-	-	-	-	-	-
Recruitment and selection (e.g. Careers, REDS)	Manual process	45	3,48	0,44	3,69	0,50	3,09	0,56
	Use e-HRM tool	49	3,72	0,36	3,90	0,41	3,47	0,50
	Both	3	-	-	-	-	-	-
	None	4	-	-	-	-	-	-
Assessment (e.g. online MBTI, FICQ)	Manual process	49	3,53	0,46	3,73	0,51	3,13	0,61
	Use e-HRM tool	27	3,74	0,38	3,91	0,44	3,55	0,41
	Both	4	-	-	-	-	-	-
	None	19	3,69	0,35	3,93	0,41	3,28	0,51
Training and development (e.g. edu-online)	Manual process	27	3,53	0,42	3,78	0,46	3,02	0,63
	Use e-HRM tool	66	3,63	0,41	3,80	0,46	3,37	0,50
	Both	6	4,02	0,25	4,28	0,25	3,50	0,45
	None	2	-	-	-	-	-	-
Talent management (e.g. leadership pipeline)	Manual process	60	3,62	0,40	3,84	0,44	3,22	0,58
	Use e-HRM tool	28	3,57	0,48	3,72	0,53	3,35	0,53
	Both	3	-	-	-	-	-	-
	None	9	3,66	0,35	3,89	0,50	3,27	0,28
Succession planning	Manual process	77	3,59	0,43	3,78	0,48	3,24	0,57
	Use e-HRM tool	7	3,88	0,45	4,11	0,52	3,55	0,58
	Both	0	-	-	-	-	-	-
	None	16	3,67	0,30	3,89	0,33	3,28	0,43
Compensation and benefits	Manual process	42	3,60	0,45	3,78	0,50	3,28	0,62
	Use e-HRM tool	40	3,60	0,40	3,80	0,44	3,28	0,53
	Both	6	3,87	0,12	4,18	0,22	3,30	0,32
	None	11	3,64	0,48	3,88	0,54	3,18	0,49
Affirmative action and BEE	Manual process	63	3,55	0,42	3,74	0,47	3,21	0,53

	Use e-HRM tool	13	3,87	0,41	4,02	0,47	3,75	0,54
	Both	1	-	-	-	-	-	-
	None	22	3,66	0,40	3,94	0,46	3,14	0,47
Employee / Labour relations	Manual process	78	3,61	0,41	3,80	0,46	3,27	0,53
	Use e-HRM tool	6	4,01	0,29	4,18	0,35	3,95	0,39
	Both	1	-	-	-	-	-	-
	None	13	3,46	0,47	3,73	0,56	2,94	0,51
Strategic HR and HR planning	Manual process	77	3,62	0,42	3,82	0,48	3,27	0,53
	Use e-HRM tool	8	3,96	0,35	4,19	0,33	3,68	0,62
	Both	1	-	-	-	-	-	-
	None	10	3,28	0,22	3,52	0,33	2,81	0,40
Productivity monitoring (absence, turnover)	Manual process	36	3,64	0,40	3,84	0,43	3,28	0,56
	Use e-HRM tool	45	3,63	0,44	3,81	0,50	3,35	0,58
	Both	4	-	-	-	-	-	-
	None	13	3,53	0,46	3,77	0,55	3,03	0,47
Personnel research and organisational development	Manual process	57	3,59	0,44	3,77	0,49	3,26	0,57
	Use e-HRM tool	20	3,68	0,41	3,88	0,48	3,40	0,59
	Both	3	-	-	-	-	-	-
	None	17	3,52	0,32	3,76	0,38	3,11	0,49
Payroll operation (e.g. Payroll Innovations)	Manual process	10	3,68	0,61	3,91	0,59	3,16	0,88
	Use e-HRM tool	82	3,64	0,41	3,83	0,47	3,32	0,52
	Both	1	-	-	-	-	-	-
	None	7	3,39	0,21	3,64	0,34	2,95	0,30

TABLE 4.22 SIGNIFICANCE OF DIFFERENCES BETWEEN MEAN SCORES FOR E-HRM USER GROUPS ACROSS THE DIFFERENT HR PROCESSES ON THE TOTAL SCORE AND SUBSCORES OF THE E-HRM ATTITUDE QUESTIONNAIRE

HR Process	**Scale**			**Sig.**	**Eta Squared**
Performance Management	Total e-HRM scale	F(2,98)=	6,875	0,002*	0,12
	FACTOR1	F(2,98)=	5,143	0,008*	0,09
	FACTOR2	F(2,98)=	11,328	0,000*	0,19
			t-test		
Recruitment and selection	Total e-HRM scale	t(92)=	-2,899	0,090	
	FACTOR1	t(92)=	-2,292	0,024*	0,05
	FACTOR2	t(92)=	-3,538	0,001*	0,12
			ANOVA		
Assessment	Total e-HRM scale	F(2,92)=	2,475	0,090	
	FACTOR1	F(2,92)=	1,929	0,151	
	FACTOR2	F(2,92)=	5,247	0,007*	0,10
Talent management	Total e-HRM scale	F(2,94)=	0,191	0,827	
	FACTOR1	F(2,94)=	0,770	0,466	
	FACTOR2	F(2,94)=	0,494	0,612	
Succession planning	Total e-HRM scale	F(2,97)=	1,685	0,191	
	FACTOR1	F(2,97)=	1,783	0,174	
	FACTOR2	F(2,97)=	1,001	0,371	
Compensation and benefits	Total e-HRM scale	F(2,97)=	0,750	0,525	
	FACTOR1	F(2,97)=	1,328	0,270	
	FACTOR2	F(2,97)=	0,103	0,958	
Affirmative action and BEE	Total e-HRM scale	F(2,95)=	3,286	0,042*	0,06
	FACTOR1	F(2,95)=	2,794	0,066	
	FACTOR2	F(2,95)=	6,595	0,002*	0,12
Employee / Labour relations	Total e-HRM scale	F(2,94)=	3,736	0,027*	0,07
	FACTOR1	F(2,94)=	2,038	0,136	
	FACTOR2	F(2,94)=	7,773	0,001*	0,14
Strategic HR and HR planning	Total e-HRM scale	F(2,92)=	6,480	0,002*	0,12
	FACTOR1	F(2,92)=	4,631	0,012*	0,09
	FACTOR2	F(2,92)=	6,306	0,003*	0,12
Productivity monitoring (absence, turnover)	Total e-HRM scale	F(2,91)=	0,317	0,729	
	FACTOR1	F(2,91)=	0,094	0,910	
	FACTOR2	F(2,91)=	1,637	0,200	
Personnel research and organisational development	Total e-HRM scale	F(2,91)=	0,730	0,485	
	FACTOR1	F(2,91)=	0,440	0,645	
	FACTOR2	F(2,91)=	1,234	0,296	
Payroll operation	Total e-HRM scale	F(2,96)=	1,251	0,291	
	FACTOR1	F(2,96)=	0,682	0,508	
	FACTOR2	F(2,96)=	1,721	0,184	

Note: significant differences indicated with *

Figure 4.5 indicates that on performance management, affirmative action and BEE, employee or labour relations, and strategic HR and HR planning processes, there are significant differences in attitude between the use of a manual process, an e-HRM tool or a combination of manual and e-HRM tools, or neither manual nor e-HRM tool. Respondents who utilise e-HRM tools have more positive attitudes regarding e-HRM tool use on the HR processes mentioned above.

Those who use both e-HRM tools and manual processes for **performance management** processes are also seen to have more positive attitudes towards e-HRM tools than those who use a manual process.

Due to the decentralised, owner-manager culture at the Bank, performance management is practised very differently from segment to segment. Some segments have purchased performance management systems in the past and utilise these, while others use Excel spreadsheets for performance management. The only centralised function concerning performance management is the capturing of annual performance scores onto the centralised payroll system. For this reason, the finding that respondents who use e-HRM tools are more positive towards e-HRM tools, is justified. The added efficiency and time saving that results from using e-HRM tools within a decentralised environment such as the Bank, can definitely be viewed as an added benefit that would greatly assist in coordinating, compiling and analysing performance data.

For the HR process of **affirmative action and BEE**, there were significant differences in the attitudes of respondents who used e-HRM tools and respondents who used manual processes. Those utilising e-HRM were more positive. When employment equity activities are conducted using e-HRM tools, the process is faster and more accurate, and quality data is the result. For this reason, those using e-HRM tools for this process, would have more positive attitudes about using an automated process for it.

Exposure to web-based **employee and labour relations** processes may be the reason that individuals who utilise e-HRM tools are more positive about e-HRM, than those using manual tools for the process.

Regarding attitudes towards e-HRM tools for **strategic HR and HR planning processes**, there is a marked difference in attitude between those respondents who use e-HRM tools and those who do not. Those who use e-HRM tools for this purpose are much more positive regarding this application of e-HRM than respondents who do not use any tool.

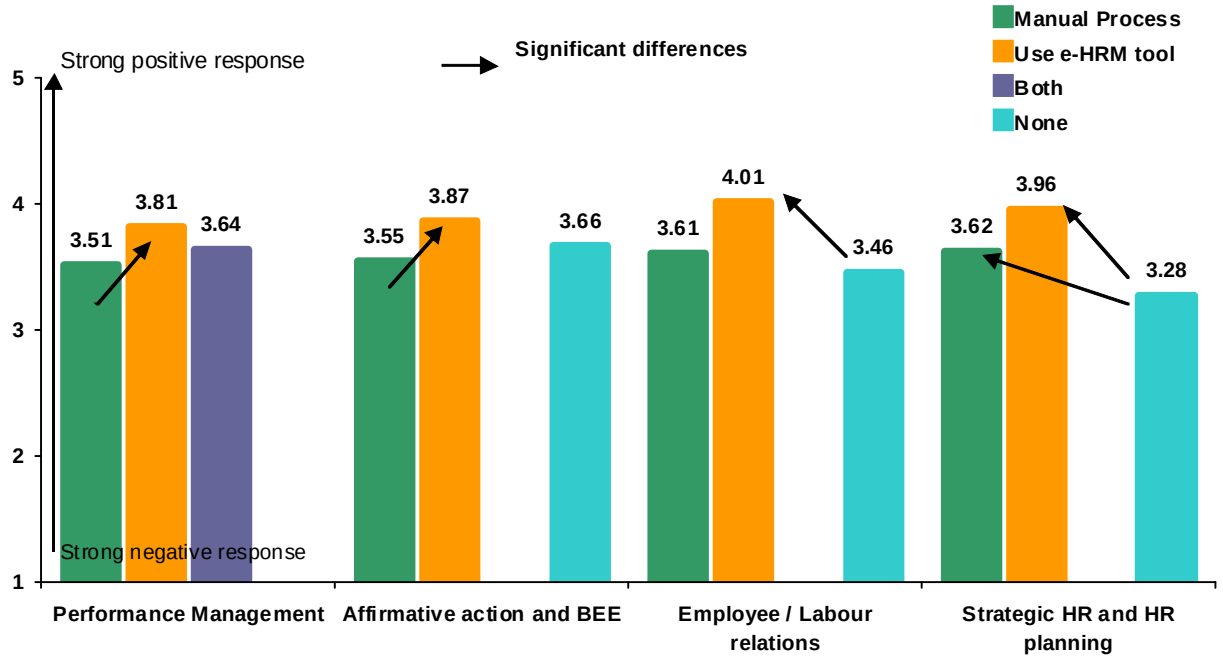


Figure 4.5 Mean scores for tool usage on HR processes with significantly different scores on the total e-HRM attitude scale

On factor 1, which refers to "improved HR information and strategic service delivery", again, respondents that use e-HRM tools appear to have more positive attitudes in general towards e-HRM tools, than respondents who use manual processes or do not use any HR process at all. Significant differences regarding recruitment and selection processes and strategic HR and HR planning were evident.

The mean scores for recruitment and selection processes indicate that respondents who utilise e-HRM tools are more positive about e-HRM than respondents who use manual processes. The Bank has an internal **recruitment** website that is used for both internal and external recruitment. This may be the reason why attitudes towards this HR process are more positive. The widespread use of e-recruitment at the Bank allows for greater reach to external candidates and give opportunities to internal candidates to apply for suitable roles. Conducting recruitment in the traditional ways, where adverts of vacancies are placed in the newspaper and many applicants have to be screened, then shortlisted, means that the recruitment and selection processes are much more time consuming and costly. Panayotopoulou et al. (2007) agree, and emphasise the many benefits that e-recruitment brings, namely saving in time and cost and an increased quality candidate pool.

A large difference was also identified between e-HRM tool users and those who do not use any tool or process for **strategic HR and HR planning**. This may be due to individuals not having exposure to e-HRM tools used for strategic HR and HR planning. These individuals may not have full insight to what such tools can do and therefore will not be as positive about such tools.

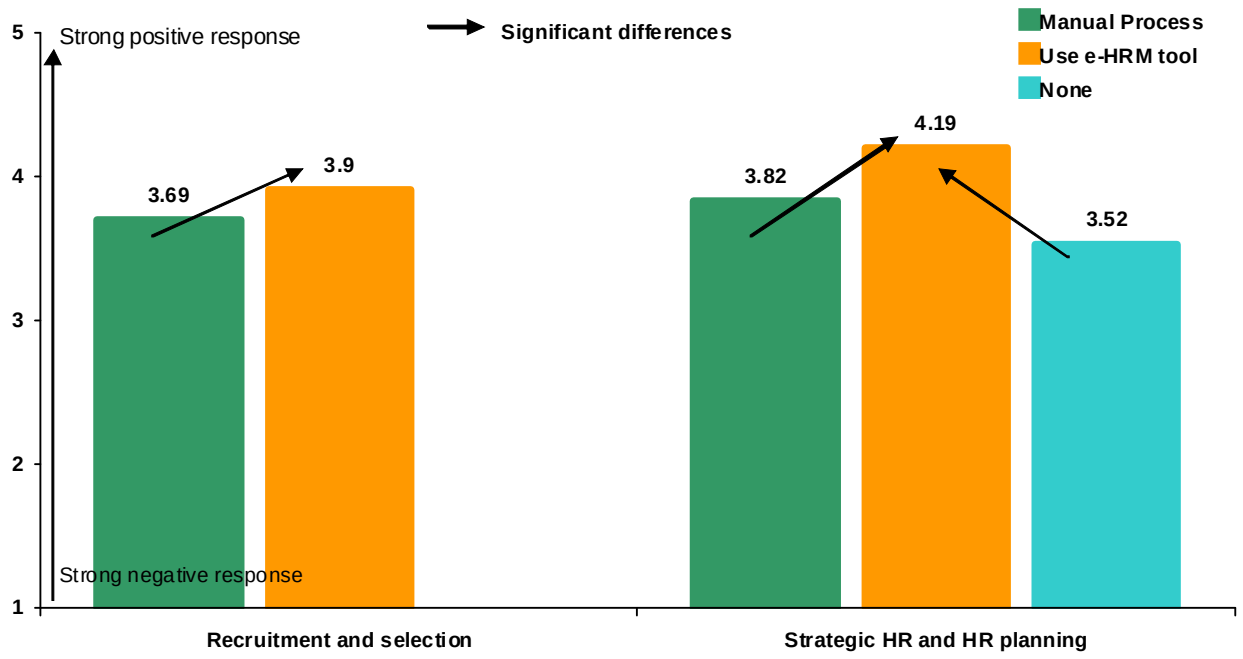


Figure 4.6 Mean scores for tool usage on HR processes with significantly different scores on factor 1

Factor 2 concerns "improved personal efficiency and organisational effectiveness". The mean scores for this factor are shown in Figure 4.8. Significant differences were found regarding the recruitment and selection, affirmative action and BEE, employee or labour relations, and strategic HR and HR planning processes. These HR processes mainly concern improvements in organisational effectiveness, in that, by having adequate performance management processes, affirmative action and BEE processes, employee and labour relation processes, and strategic HR and HR planning processes, the organisation as a whole will be more effective.

There was a large difference in attitude towards e-HRM tools regarding the **recruitment and selection process**, that is, those that use e-HRM tools for this HR process had more positive attitudes towards e-HRM tools, than those who use manual processes. The reasons for this have been highlighted in the discussion regarding mean differences for factor 1 above.

Affirmative action and BEE, when conducted utilising e-HRM tools, elicit much more positive attitudes than when done manually, or when neither e-HRM nor a manual process is used.

Also with the **employee and labour relations process**, those who utilise e-HRM were more positive than respondents who used manual processes, and those who do not use e-HRM or a manual process. The largest difference was found between those who use an e-HRM tool and those who do not use any process to conduct employee and labour relations practices. There was just over one point difference (2,94 to 3,95) in attitude between the two. This could be due to the fact that only specialists would conduct these processes and consequently use e-HRM tools for them. As such, one could conclude that those that use neither manual processes nor e-HRM tools for employee and labour relations processes do not conduct these processes at all, and would therefore not have knowledge or exposure to e-HRM tools for this purpose.

The final significant difference that was found concerned **strategic HR and HR planning**. When making strategic decisions, e-HRM tools are not used to actually make the decision; rather, e-HRM tools are used to support this decision-making. This is expanded by Gardner et al. (2003) who expect that greater use of information technology will allow HR professionals to focus on strategic issues. Line management and professionals alike would use information from e-HRM, such as head-count and salary ranges, to make strategic decisions. E-HRM also allows line management, through access to HR information, to be more involved in strategic decision-making, for instance, in reward and remuneration decisions (Gardner et al., 2003). When the benefits of e-HRM are clear, those who utilise e-HRM tools for strategic HR and HR planning, would have more positive attitudes towards e-HRM than those who conduct these processes manually or not at all. Respondents who do not use either e-HRM tools or manual processes may not actually be involved in strategic decision making and would therefore not have exposure to the associated decision-support tools.

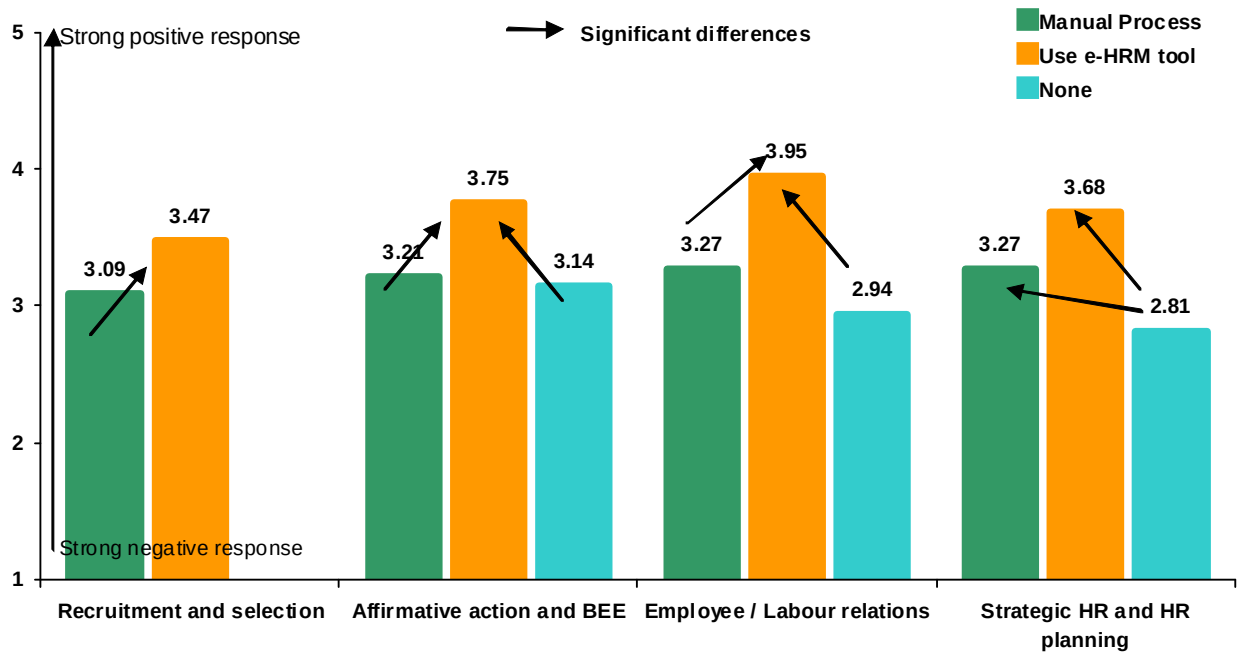


Figure 4.7 Mean scores for tool usage on HR processes with significantly different scores on Factor 2

4.7 SUMMARY OF HYPOTHESES

TABLE 4.23 HYPOTHESES

Hypotheses	**Decision**
H_1: HR professionals have a greater preference for utilising e-HRM tools than line management or other groups.	**Rejected**
H_2:Differences in demographic characteristics (gender, age, race and qualifications) affect attitudes towards e-HRM tool usage.	**Rejected**
H_3: There is a difference in overall attitudes towards e-HRM tool usage, depending on the job level, role in the organisation and number of years with the organisation.	**Rejected**
H_4: Users of e-HRM tools have a more positive attitude towards these tools than those using manual processes.	**Not rejected**
H_5: There is a difference in overall attitudes towards e-HRM tool usage, depending on the HR process used.	**Not rejected**

4.8 CHAPTER SUMMARY

The results of the empirical study were addressed in this chapter. Sample demographics were analysed, followed by an examination of the reliability and factor structure of the questionnaire. E-HRM tool usage and attitudes towards e-HRM were then analysed and the hypotheses tested against these results.

Chapter 5 comprises the final step of the study, namely discussion of conclusions, limitations and recommendations based on this study.

CHAPTER 5 CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter contains step 7 of the empirical study. The conclusions of the research are discussed, followed by the limitations and recommendations for further research.

5.1 CONCLUSIONS

Conclusions will be drawn about the literature review and the empirical study, based on the aims of the research as described in chapter 1.

The general aim of this research was to investigate, analyse and evaluate attitudes towards e-HRM tools, by developing and validating an attitude measure to do so. This was achieved by addressing the specific aims of the research. Conclusions will be drawn, based on the specific goals.

5.1.1 Conclusions: Literature review

The following conclusions were made, based on the specific aims regarding the literature review:

The first specific aim of this study was to conceptualise e-HRM. This was achieved by defining the concept of e-HRM. E-HRM, according the literature, is the junction between information technology and human resource management, whereby HR processes are automated and supported through the use of web-based technology. E-HRM is also seen as a facilitative tool improving communication between stakeholders, including human resource professionals, line management and employees and potential employees. Within the research site, the understanding of what e-HRM is about, was extremely important as much of the time, there are overlaps between HRIS, ERP systems and e-HRM. The Bank is transitioning between the operation and relational stages, and also exhibits some of the elements associated with the strategic stage of e-HRM development; as such, it is of the utmost importance that there is a clear understanding of the concept of e-HRM and also of where and how it can be used.

The second aim of the literature review was to gain an understanding of the historical development of e-HRM. From as early as the 1940s, the human resource management function was earmarked as a business function that would gain great benefit from automation through technology.

The personal computer, Internet and intranet represented a new link between employees and management, allowing for greater communication and interaction. The introduction of ERP systems to connect business operations and share business and people information, and the implementation of e-HRM tools bring computer development up to date. There is no question regarding the fact that information technology in HR work has changed this world completely, opening new and better avenues for improved efficiency and effectiveness, and better communication – internal as well as external to the organisation.

It is believed that there will still be many more developments in the e-HRM space that will be even more beneficial in the future. Organisations must be aware that there is a need for flexibility and dynamism to cope with the increasingly rapid changes in the way the workforce is managed.

As indicated above, another important conclusion is that there is a fundamental difference between e-HRM, HRIS and ERP systems. The identified difference between e-HRM and HRIS is the intended audience. While HRIS are designed for human resource professionals alone, e-HRM is also targeted at line management and employees. ERP systems, on the other hand, integrate core business operations, including human resource management, by using a single software programme that runs off a single database. In essence, e-HRM tools can be integrated into an ERP system.

E-HRM is intrinsically linked to HRM practices. An explanation of this in chapter 2, answers the third aim which pertains to an examination of how e-HRM relates to the

development of HRM. The conclusions that can be drawn from this section are as follows:

- Essentially, there are three types of human resource management within the organisation: operational HRM, relational HRM, and transformational HRM. An organisation will need to make a choice of how to conduct HR practices. This will be either face-to-face or through e-HRM. These types of HRM can be likened to the developmental stages of e-HRM within an organisation. They are briefly explained:

  Operational e-HRM refers to the streamlining of human resource operations and essentially relates to the automation of certain transactional HR activities, such as payroll operations and capturing of personnel data. This is the most basic type of e-HRM.

  Relational e-HRM is a more complex form of e-HRM and involves the building of relationships between stakeholders through the use of e-HRM tools. This will include more complex HR practices, such as recruitment and selection, performance management, training and compensation.

  Transformational e-HRM is concerned with strategic HR initiatives that can be supported by information technology, and includes knowledge management, cultural change, management development and strategic redirection. Transformational e-HRM can be achieved through strategic business partnering, creating centres of expertise, and administration of service centres.
- In reality, the three types of e-HRM are often used simultaneously. Organisations will have elements from each of the types of e-HRM, but in an ideal world, each stage should be developed incrementally, that is, a strong operational foundation will enable better relational e-HRM, which in turn will be beneficial for meaningful transformational e-HRM.

An additional critical conclusion can be drawn from the literature review. The majority of HR time, up to 75%, is being spent on operational, transactional tasks, 15-30% of time is being spent on relational tasks, and only 5-15% of HR time is directed at strategic,

transformational activities. E-HRM is seen as one of the key initiatives to refocus the way that HR professionals are using there time, so as to redirect attention to the more critical strategic initiatives. This again can be linked to the stage of e-HRM that the Bank is in. The Bank has elements of all three stages of development: operational, relational and transformational, but mostly, the operational stage is evident. The research revealed that the main HR operation where e-HRM is utilised, is in payroll – which is typical of an organisation that is in the operational stage of e-HRM.

The next aim relates to uses and benefits of e-HRM. E-HRM can be used in most HR processes. This includes:

HR planning and administration relate to the basic transactional and communication activities that are required for the management of the workforce. E-HRM has played a significant role in the collection, storage and analysis of this information about the workforce. With e-HRM, much of these transactional tasks, such as updating personal information, can be done by employees or management through HR self-service.

Acquiring human resources is associated with the recruitment cycle of attraction, recruitment, assessment and selection, and finally retention. E-HRM has made it much easier for employees and job applicants to access information about potential positions – in essence turning the organisation into its own global recruitment agency. It also eliminates obviously unsuitable job applicants early on in the recruitment process, through the use of online questionnaires and assessments which help to create an initial shortlist. Much of the automation of the recruitment process helps to lessen unnecessary, costly and time-consuming face-to-face interaction with unsuitable candidates. In terms of retention, e-HRM is an empowering tool, enabling employees to make their own decision regarding new opportunities, training and development needed for these opportunities.

Evaluating human resources relates to performance management. It may be concluded that the influence of information technology on performance management primarily streamlines the process and the administration, including the distribution, collection and collation of performance management material and scores.

Compensation and reward form another area where e-HRM has had great impact. Achieving employee empowerment and independence is possible with e-HRM. Employees are enabled to make informed choices regarding how they would like to be compensated and rewarded. Information is provided to employees on the organisation's benefits and compensation websites.

Training and development of employees using e-HRM includes training needs analysis as well as the actual training. E-Learning can be conducted through a company's intranet or via the Internet, and can be tailored to meet the specific needs of the training participant. E-HRM-facilitated training and development have many benefits, including cost reduction, reduction in time spent out of the office, and better still, more effective learning.

Assessing employee commitment is the final area where e-HRM can add value. By assessing employee commitment on a regular basis, issues that arise can be resolved quickly. It also allows for a directed solution that is based on survey findings. A commitment survey can also be used to direct strategic initiatives, as findings can be drawn on to ensure that the focus is on the correct strategic issues.

The fourth aim of the research was to investigate the impact or effects of e-HRM on the work of HR professionals and line managers. The following most pertinent impacts were highlighted in the literature:

- The first and most referenced impact is that human resource professionals have, through e-HRM, been able to take on the strategic role of HR business partner, and in so doing, have been able to collaborate with management in strategy development and strategic decision making that has an impact on the overall business strategy.
- The human resource management function as a whole can deliver improved service when using e-HRM for HR practices. This can be seen in the streamlining of basic HR administrative processes through employee and manager self-service. With employee self-service, data quality is improved, as employees have access to specific HR information that ordinarily they would need to request from the HR department. Manager self-service is also beneficial in improving HR service

delivery, as many of the process steps are removed which speeds up HR-related processes. In conclusion, e-HRM technologies can improve cost, turn-around time of HR transactions, as well as the quality of HR information.

- “Up-skilling” of HR professionals has become a necessity with increased use of e-HRM tools within organisations. There are specific skill requirements to firstly to cope with this technological advancement and also to cope with the demands of a more strategic role. Understanding organisational behaviour and having a strategic view of the organisation, can be dealt with in organisational psychology and strategic human resource management training; however, technical information technology skills are generally lacking (Hempel, 2004). There is also a need for HR professionals to become better equipped regarding specialist functions.
- Line managers are now taking on some of the HR work previously performed by HR professionals. Manager self-service has allowed line managers to become more independent regarding basic HR decisions; only now, instead of HR professionals doing the HR work, they now perform a consultative, support role.
- The role of the human resource professional is fundamentally changed with the use of e-HRM. As much of the transactional work no longer forms the core responsibility of the HR professional, they have had to learn to play a more strategic role. Wright and Dyer (2000) view changes in HR roles in relation to usage of e-HRM. HR professionals, as mentioned above, now must play a more strategic role, but this needs to be supported by extensive change management. The change agent role becomes more important when e-HRM is in place.
- The final impact identified relates to confidentiality and security of organisational information. With a great deal of sensitive information at the fingertips of many people, there is a risk that information will be used inappropriately. Phillips et al. (2008) propose guiding principles pertaining to e-HRM information, which are important to take note of in light of the amount of accessible data that e-HRM has made available.

The final aim of the literature review was to review the implications of e-HRM for IO psychologists. To understand the implications of e-HRM for IO psychology, one needs to

distinguish between the roles of HRM and IO psychology in terms of e-HRM. Human resource professionals operationalise e-HRM tools in the organisation, whereas IO psychologists look at how e-HRM affects the attitudes, behaviours and roles of the users of the tools. IO psychologist will view e-HRM from a psychological perspective and play a major role in the development and implementation decisions. They could play a consultative role and consult with business to ensure that the design and implementation of e-HRM tools will facilitate organisational functioning through the way that users of e-HRM perceive and then use e-HRM tools. Another important role that IO psychologist could play is that of change management. With an understanding of behaviour at work, the IO psychologist can add value in playing this role.

5.1.2 Conclusions: Empirical study

In terms of the empirical study, the specific aims of this research and conclusions are outlined below. Conclusions are also drawn, based on the demographic sample, e-HRM tool usage and attitude toward e-HRM tools.

The aim to develop and validate an instrument to measure attitude toward e-HRM was achieved in this study. This was done in the following way:

The measure utilised for the research was in the form of a questionnaire. The questionnaire was made up of three distinct sections. Section one was developed to collect biographical and occupational information on the respondent, and specifically included data regarding position, job level, segment, qualification, tenure, age, gender and race. Section two focused on tool usage. A complete list of the main HR processes typically conducted in organisations was presented, and respondents were asked to select whether they utilised a manual HR process, utilised e-HRM, used both processes or did not use any process. Section three dealt with attitudes towards e-HRM. Respondents were presented with five alternate responses to each question on an agree/disagree continuum. A five-point Likert-type scale was utilised.

A number of measures were taken by the researcher to ensure the validity of the e-HRM attitudinal measure:

- Firstly, an extensive literature review was conducted and questions were developed, based on insights gained from the literature. In this way, relatedness to the topic at hand was assured.
- The second way in which validity was increased was that subject matter experts (SME) were consulted. There were two rounds of testing the items with subject matter experts. The first set of subject matter experts had specific knowledge of information technology used for HR purposes. These SME were consulted to ensure that the developed items addressed issues concerning attitudes towards e-HRM. The second set of SME were suitably experienced in social science research. These individuals were consulted to ensure that the phrasing, language and format of the questionnaire were appropriate.
- Thirdly, several of the items included in the questionnaire were negatively worded to control for response bias, and so increase the validity of the scales.

The next three aims, to determine whether HR professionals utilise e-HRM tools more than line managers; to establish whether or not there is a difference in the HR practices of HR professionals and line managers; and to ascertain whether or not there is a difference in the attitude towards e-HRM between HR professionals and line managers, will be dealt with in the next section that examines the demographic sample, e-HRM tool usage and attitudes toward e-HRM tools.

5.1.2.1 Conclusions about sample demographics

The majority of the sample consists of white, female HR professionals who have completed an honours degree. Members of this group have been at the organisation for between five and nine years, and are between the ages of 29 and 39.

It can be concluded that this sample distribution was due to a number of factors, namely the sampling methodology of utilising HR networks as well as the assistance of a senior HR practitioner in distributing the questionnaires. HR professionals have more exposure to e-HRM tools than other groups in the organisation; they also have a vested interest in the topic, as this technology would have a greater effect on the work of HR professionals than other professions. The population of the study is typical of most large organisations, with a large contingent of young, junior employees followed by a smaller mid-age group, and a small percentage of older, more senior individuals. Finally, the HR population of the organisation is mainly made up of white females, which is reflected in the research results.

5.1.2.2 Conclusion about reliability and exploratory factor analysis

- The e-HRM attitudinal measure as a whole was found to be reliable, indicating a high level of internal consistency of the questionnaire.
- The subscales of the questionnaire yielded less consistent reliability scores, which led to the decision to conduct a factor analysis.
- An exploratory factor analysis was conducted using a principal axis factor analysis with an oblique promax rotation; three factors were retained for further investigation.
- The first factor consists of items such as “e-HRM information and decision-support tools enable better strategic HR decisions”. The majority of the items refer to issues regarding the strategic use of e-HRM information and the application of this information to direct strategic HR initiatives. This was corroborated in the literature as being one of the most obvious impacts of e-HRM, that is, e-HRM allows for easier access to quality information to partner with business and make informed strategic decisions.
- The second factor accounted for contains items such as “HR services have been streamlined and standardised using information technology” and refers to improved efficiency and effectiveness supported by e-HRM. This is also strongly supported in the literature as being one of the key goals and impacts of e-HRM. Efficiency

and effectiveness in terms of improved service delivery of HR transactions can be achieved with e-HRM.

- The new factor 1 and factor 2 were found to be reliable, displaying Cronbach's Alpha coefficients of 0,94 and 0,87 respectively.
- A correlation analysis confirmed various significant relationships. Essentially, these relationships confirm the internal reliability of the e-HRM attitudinal measure, and they indicate that there is a relationship between e-HRM attitudes and the two newly identified factors.

5.1.2.3 Conclusions about e-HRM tool usage

- Regarding overall e-HRM tool usage, the majority of the sample utilised manual HR processes.
- None of the occupational or demographic differences found for tool usage preference with regard to the different HR processes had high effect sizes (larger than 0,5); therefore, it was decided not to control for any of the potential effects of these differences on further analysis with the tool.
- No significant differences were found between occupational groups on total tool preference.
- There was a significant difference in preference for tool usage when conducting performance management processes, and the number of years that a respondent has been with the company. It appears that respondents who have been with the company for between five and nine years are more comfortable with the usage of e-HRM processes, whereas newer employees may still prefer manual processes. Employees who have been with the company for more than 10 years may be more set in their ways, and therefore be reluctant to utilised newer e-HRM tools for HR processes.
- The position or role of the respondent also resulted in significant differences with regard to preference for tool usage on compensation and benefits processes and recruitment and selection. In both processes, HR is more inclined to use the e-HRM tool than line management or other roles.

- Significant age differences were found on two processes: training and development, and performance management. For the training and development process, all age groups, except the 51-61 year grouping, mainly utilised e-HRM tools for this process. For performance management processes, the majority of the sample preferred to use manual processes.
- Gender differences were apparent on recruitment and selection HR processes. It appears that woman use e-HRM tools for this process more than men. The reason for this finding is unclear. It may suggest that woman are in roles that focus on recruitment and selection; however, this cannot be substantiated with the available data.
- Qualification differences were found on the recruitment and selection process and on the labour relations process. It emerged that respondents who have a Matric certificate are more inclined to use e-HRM tools for recruitment and selection processes. Regarding employee and labour relations, manual processes are predominantly used. This is in line with practices at the Bank. Much of the employee and labour relations activities are conducted face to face.
- There were no differences with regard to tool usage preferences by race.

5.1.2.4 Conclusions about attitudes toward e-HRM

- No significant differences on the total e-HRM attitude score or the two subscales were found for the demographic variables. It therefore appears that demographic variables do not have a significant impact on attitudes towards e-HRM tools.
- No significant differences on the total e-HRM attitude score or the two subscales were found for position or role of respondents; nor were any differences found for respondents by level or number of years with the company. As a result, the hypothesis that there would be significant differences in attitudes towards e-HRM tools depending on certain occupational variables, was not supported. This was a strange finding, as one would imagine that HR professionals would have more positive attitudes towards e-HRM, as they are the principal users of the tools within the Bank.

- Significant differences were found between the manual users, e-HRM users and equal users on the overall e-HRM attitude scale, as well as on the two subscales, which indicated that e-HRM users had significantly more positive attitudes towards e-HRM tools than manual users on the total scale as well as on the two subscales. All in all, attitudes towards e-HRM are influenced by multiple factors. In this research, one main factor was linked to a positive attitude toward e-HRM: individuals who were overall users of e-HRM tools had a more positive attitude towards e-HRM than manual users and equal users. The implication of this finding indicates that individuals who have more exposure to a particular tool, such as e-HRM, and actually use this tool for HR practices, would logically have more positive feelings towards the tool.
- Differences in attitudes towards e-HRM tools depending of HR process were also discovered in this study. Significant differences were found between the groups on the overall as well as on the first and second subscale for many of the HR processes under examination, namely performance management, affirmative action and BEE, employee and labour relations, strategic HR and HR planning as well as recruitment and selection.
- An ERP system is being implemented at the Bank in the next 18 months and this may affect usage of and attitude towards e-HRM tools.

Conclusions regarding hypotheses

The following hypotheses were not rejected:

H_4: Users of e-HRM tools have a more positive attitude towards these tools than those using manual processes.

H_5: There is a difference in overall attitudes towards e-HRM tool usage, depending on the HR process used.

The following hypotheses were rejected:

H_1: HR professionals have a greater preference for utilising e-HRM tools than line management or other groups.

H_2: Differences in demographic characteristics (gender, age, race and qualifications) affect attitudes towards e-HRM tool usage.

H_3: There is a difference in overall attitudes towards e-HRM tool usage, depending on the job level, role in the organisation and number of years with the organisation.

5.2 LIMITATIONS

The limitations of the literature review and the empirical study are outlined below.

5.2.1 Limitations: Literature review

In terms of the literature review, the researcher experienced difficulty finding information available in terms of e-HRM research conducted in South Africa. It also appears that there was very little research, both internationally and locally, that dealt with attitudes of line management and HR professionals towards e-HRM. There were only two articles that specifically focused on this area. Voermans and Van Veldhoven (2007) conducted a study that investigated attitude toward e-HRM by asking managers and employees about their previous experiences with regard to IT systems in general, their preferred HR roles, and their attitude towards e-HRM systems. Kinnie and Arthurs (1996) also conducted a study survey, and looked at the IT skills and knowledge of personnel specialists and their attitudes towards the use of IT.

This is an indication that further research is required in the area of e-HRM, and specifically, the attitudes of users of e-HRM in a South African context.

In many of the studies referenced in the literature, the distinction between human resource information systems, web-based human resource management, and e-HRM was not clear and there was much overlapping between these concepts.

Due to the rapid changes associated with information technology, much of the research found that dated back more than ten years, was found to be somewhat inconsistent with today's practices. For instance, it is commonplace today in most organisations, and particularly in the research site, that individuals have laptops and wireless Internet connections and therefore may work from home more frequently. This was not addressed in any of the research concerning e-HRM. The studies that were reviewed mainly focused on the implementation and usage of e-HRM. Two studies focused on attitude towards e-HRM, but there were none that looked at how e-HRM affects the work life of employees and managers.

5.2.2 Limitations: Empirical study

The first limitation identified regarding the empirical research is that the study was conducted in only one organisation; therefore, caution must be exercised when generalising these results. This study was also conducted in a large South African bank whose needs, usage and attitudes to e-HRM tools would differ significantly to those of smaller businesses. Generalising outside of this context, for instance to smaller organisations, other sectors, more peripheral parts of the organisation, or other parts of the world, should only be done with great caution.

The sampling technique used can also be seen as a limitation. Non-probability sampling was used for this study and can be seen to be a limitation as the sample is not random. Participants were selected based on judgemental and convenience sampling techniques.

The final limitation relates to the sample size. The sample size of 104 respondents is lower than the recommended number of respondents required for a more robust factor analysis.

5.3 RECOMMENDATIONS

The following recommendations for future research as well as for practical applications are based on the findings of the empirical study. They are explored below.

Recommendation 1: It is recommended that a larger and broader sample be used for future research.

There is a need for future studies with larger samples to attempt to replicate the structure of the questionnaire and confirm either the new factor structure identified in the present study or find validity for the original six dimensions used in the questionnaire.

It is also recommended that an “employee” category be included in future studies, as with employee self-service, they become the principal users of e-HRM technology. Employees’ attitudes towards e-HRM practices is also an important aspect that needs to be evaluated.

Recommendation 2: It is recommended that the e-HRM attitudinal measure includes a section to evaluate the level of information technology knowledge of respondents.

The e-HRM tool usage section of the questionnaire focused on current usage of either manual processes or e-HRM processes to conduct HR practices. It is recommended in future that basic information technology skills also be assessed to identify whether or not usage of e-HRM tools is affected by this.

Recommendation 3: It is recommended that a pre- and post-test structure be adopted for organisations that are in the process of implementing e-HRM tools.

Measuring attitudes towards e-HRM tools prior to implementation and use may be useful for an organisation to assess the readiness of the intended e-HRM users. By conducting a pre-test, using the same attitudinal scale, one could assess and then conduct appropriate interventions, to ensure that the implementation and subsequent use of the technology is effective.

Recommendation 4: It is recommended that a longitudinal study be conducted in order to track attitudes towards e-HRM tools over time.

Tracking attitudes towards e-HRM over time can be indicative of the impact of changes in the various tools being used. One could also assess the concept of “practice makes perfect” where users who have great exposure to e-HRM tools, would have a more positive attitude towards the tools and most probably utilise the tools more frequently.

The fifth and final empirical research aim has been achieved by making recommendations for further research.

5.4 CHAPTER SUMMARY

In this chapter, the conclusions drawn from the literature review and the empirical study were presented. Literature review conclusions are centred on the concept of e-HRM, its historical development, as well as its uses and effects today. The conclusions of the empirical study outlined the development of the e-HRM attitudinal measure as well as the findings related to the attitudes towards e-HRM. The limitations of the study were identified and recommendations for future research were made.

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APPENDICES

APPENDIX 1 PATTERN MATRIX FOR THE THREE FACTOR SOLUTION (FACTOR COEFFICIENTS LOWER THAN 0,1 ARE SUPPRESSED)

Pattern Matrix[a]

	Factor		
	1	2	3
The use of e-HRM tools reduces time spent on transactional tasks.	0,804	-0,305	-0,137
E-HRM tools allow HR staff to redirect time onto strategic initiatives.	0,784		
E-HRM tools are essential to the role of HR practitioners becoming more strategic.	0,767	-0,251	0,199
Information supplied by e-HRM tools is essential to allowing HR professionals to act as strategic business partners.	0,744	-0,214	0,143
E-HRM information and decision-support tools enable better strategic HR decisions.	0,740		
Information supplied by e-HRM allows line managers to make better people-related decisions (e.g. promotion decisions).	0,730	0,149	
E-HRM tools can be used to improve underlying business processes.	0,724	-0,280	
Enhanced analysis is facilitated by e-HRM tools.	0,711		-0,226
Overall, I prefer using e-HRM tools to traditional HRM methods.	0,708		0,251
E-HRM tools have allowed for higher quality HR services.	0,675	0,137	
E-HRM tools allow me to work more productively.	0,668	0,178	
E-HRM tools improve quality of decision making.	0,658	0,126	-0,209
E-HRM tools allow me to work more cost efficiently.	0,643	0,143	-0,154
E-HRM tools provide current information that is beneficial to people-related decision making (e.g. decisions concerning recruitment and selection).	0,640		-0,197
E-HRM tools enable increased integration of HR processes(e.g. performance management is linked to reward and remuneration).	0,634	0,199	
Enhanced reporting is facilitated by e-HRM tools.	0,622		-0,148

E-HRM tools give line managers access to HR-related information about their employees.	0,598		0,188
E-HRM tools allow for greater data control.	0,572		0,311
“Traditional” HR skills need to be supplemented with additional skills.	0,563		-0,258
Due to e-HRM tools, HR professionals can focus attention on specific HR functions (such as talent management, strategic HR).	0,545		
E-HRM tools allow for access to real-time HR information (e.g. current head-count, EE figures).	0,544	,0150	-0,123
The use of e-HRM tools is more cost effective than traditional, manual HR practices.	0,543	-0,131	-0,225
E-HR tools allow for confidentiality of employees’ personal information.	0,532		0,460
Fewer errors occur when using e-HRM tools.	0,455	0,193	
HR professionals, with the help of e-HRM tools, can play more of an advisory role to line management.	0,449	0,140	0,254
There is a need to focus on implementing new technology to allow for better service delivery.	0,442	-0,298	0,180
HR professionals need more information technology knowledge and skills.	0,433		0,131
I rely on electronic decision-support tools (such as information from Performax) to make people-related decisions.	0,393	0,372	-0,137
HR professionals are expected to be more familiar with the business processes.	0,381	0,310	0,159
More staff members are required when using e-HRM tools.	-0,376		-0,102
E-HRM information and decision-making tools restrict my ability to make decisions.	-0,302		-0,114
HR professionals need to update their skills repertoire.	0,288	0,194	0,158
HR services have been streamlined and standardised using information technology.		0,766	0,136
HR works with management as partners in driving organisational effectiveness.	-0,172	0,763	
The use of e-HRM tools has led to the automation of routine HR work.	0,162	0,691	-0,218
Automated HR processes have been made available to line management.	-0,174	0,682	-0,196

E-HRM tools have allowed me to better understand the business (more analytical information).	0,230	0,630	
Automated transactional HR process information is made available to line managers.		0,618	
E-HRM tools have allowed me to perform the enhanced role of information broker.	0,219	0,606	
More responsibility for HR transactions should be given to line managers.	-0,123	0,579	0,158
I am satisfied with the way HR processes are currently practised.	-0,196	0,569	0,127
HR should continue to take responsibility for HR transactions.	0,407	-0,440	-0,296
There is a reliance on electronic decision-support tools to make people-related decisions, such as salary reviews.		0,436	
E-HRM tools have assisted me with regulatory issues (e.g. Financial Services Charter, tax issues).	0,259	0,417	-0,240
Implementation of e-HRM tools has required me to update my technological knowledge.	0,240	0,350	0,232
Implementation of e-HRM tools has required me to update my business knowledge.	0,218	0,262	0,246
Data security issues are a constant source of challenge when using e-HRM tools.			-0,514
Current e-HRM tools provide robust security to protect data from unauthorised access or alteration.		0,311	0,513
E-HRM tools have created a lot of work.	-0,210		-0,477
Giving responsibility for HR transactions to managers detracts from line productivity.	0,201		-0,419
HR specialists (e.g. IR Manager, Remuneration Specialist) are still the dominant HR service delivery method.		0,200	-0,228

Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalisation.

a. Rotation converged in 5 iterations.

APPENDIX 2 ITEM STATISTICS FOR THE "IMPROVED HR INFORMATION AND STRATEGIC SERVICE DELIVERY" SUBSCALE

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The use of e-HRM tools reduces time spent on transactional tasks.	125,83	268,419	0,593	0,939
E-HRM tools allow HR staff to redirect time to strategic initiatives.	126,09	254,474	0,766	0,937
E-HRM tools are essential to the role of HR practitioners becoming more strategic.	125,55	265,906	0,646	0,938
Information supplied by e-HRM tools is essential to allowing HR professionals to act as strategic business partners.	125,64	264,050	0,627	0,938
E-HRM information and decision-support tools enable better strategic HR decisions.	125,89	262,883	0,712	0,938
Information supplied by e-HRM allows line managers to make better people-related decisions (e.g. promotion decisions).	126,16	260,342	0,765	0,937
E-HRM tools can be used to improve underlying business processes.	125,84	268,112	0,560	0,939
Enhanced analysis is facilitated by e-HRM tools.	125,74	262,563	0,661	0,938
Overall, I prefer using e-HRM tools to traditional HRM methods.	125,85	262,564	0,709	0,938
E-HRM tools have allowed for higher quality HR services.	126,16	264,066	0,700	0,938
E-HRM tools allow me to work more productively.	126,08	263,017	0,719	0,938
E-HRM tools improve quality of decision making.	125,93	265,627	0,666	0,938
E-HRM tools allow me to work more cost efficiently.	126,26	265,506	0,617	0,939

E-HRM tools provide current information that is beneficial to people-related decision making (e.g. decisions concerning recruitment and selection).	126,02	260,942	0,612	0,939
E-HRM tools enable increased integration of HR processes (e.g. performance management is linked to reward and remuneration).	126,07	258,961	0,726	0,937
Enhanced reporting is facilitated by e-HRM tools.	125,72	266,711	0,597	0,939
E-HRM tools give line managers access to HR-related information about their employees.	125,89	267,458	0,667	0,938
E-HRM tools allow for greater data control.	126,05	267,676	0,628	0,939
“Traditional” HR skills need to be supplemented with additional skills.	125,77	274,224	0,441	0,940
Due to e-HRM tools, HR professionals can focus attention on specific HR functions (such as talent management, strategic HR).	126,02	265,080	0,539	0,939
E-HRM tools allow for access to real-time HR information (e.g. current head-count, EE figures).	126,11	262,585	0,596	0,939
The use of e-HRM tools is more cost effective than traditional, manual HR practices.	125,90	271,587	0,431	0,940
E-HR tools allow for confidentiality of employees’ personal information.	126,09	267,302	0,551	0,939
Fewer errors occur when using e-HRM tools.	126,51	264,276	0,557	0,939
HR professionals, with the help of e-HRM tools, can play more of an advisory role to line management.	125,83	269,476	0,575	0,939
There is a need to focus on implementing new technology to allow for better service delivery.	125,59	273,578	0,317	0,941

HR professionals need more information technology knowledge and skills.	125,93	270,938	0,417	0,940
I rely on electronic decision-support tools (such as information from Performax) to make people-related decisions.	127,08	260,718	0,532	0,940
HR professionals are expected to be more familiar with the business processes.	126,03	270,286	0,431	0,940
More staff members are required when using e-HRM tools.	126,22	270,976	0,397	0,941
E-HRM information and decision-making tools restrict my ability to make decisions.	126,26	272,885	0,281	0,942
HR professionals need to update their skills repertoire.	125,78	273,275	0,423	0,940
HR should continue to take responsibility for HR transactions.	126,66	281,607	0,019	0,944

APPENDIX 3 ITEM STATISTICS FOR THE "IMPROVED PERSONAL EFFICIENCY AND ORGANISATIONAL EFFECTIVENESS" SUBSCALE

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
HR services have been streamlined and standardised, using information technology.	39,96	53,615	0,700	0,855
HR works with management as partners in driving organisational effectiveness.	39,66	55,630	0,651	0,858
The use of e-HRM tools has led to the automation of routine HR work.	39,73	55,839	0,614	0,860
Automated HR processes have been made available to line management.	40,36	56,807	0,530	0,865
E-HRM tools have allowed me to better understand the business (more analytical information).	40,02	56,148	0,698	0,857
Automated transactional HR process information is made available to line managers.	40,17	57,248	0,547	0,864
E-HRM tools have allowed me to perform the enhanced role of information broker.	40,14	57,396	0,703	0,858
More responsibility for HR transactions should be given to line managers.	40,16	58,411	0,457	0,869
I am satisfied with the way HR processes are currently practised.	40,91	58,746	0,421	0,871
There is a reliance on electronic decision-support tools to make people-related decisions, such as salary reviews.	40,17	57,142	0,467	0,869
E-HRM tools have assisted me with regulatory issues (e.g. Financial Services Charter, tax issues).	40,31	59,363	0,438	0,870

Implementation of e-HRM tools has required me to update my technological knowledge.	40,07	57,601	0,527	0,865
Implementation of e-HRM tools has required me to update my business knowledge.	40,17	58,631	0,436	0,870

APPENDIX 4 ITEM STATISTICS FOR FACTOR 3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Data security issues are a constant source of challenge when using e-HRM tools.	7,54	3,797	0,502	0,474
Current e-HRM tools provide robust security to protect data from unauthorised access or alteration.	8,33	4,573	0,437	0,538
E-HRM tools have created a lot of work.	8,24	4,207	0,374	0,574
Giving responsibility for HR transactions to managers detracts from line productivity.	8,15	4,296	0,319	0,618

APPENDIX 5 VARIATIONS IN E-HRM TOOL USAGE ACCORDING TO DEMOGRAPHICS

Pearson Chi-Square Tests

		Position/ Role	Level	Segment	Qualification	Years at Bank	Age	Gender	Race
Performance Management	Chi-square	6,110	6,782	44,848	7,008	15,677	17,313	2,434	3,203
	df	4	6	18	8	8	6	2	6
	Sig.	0,191[a,,b]	0,341[a,,b]	0,000[a,,b,,*]	0,536[a,,b]	0,047[a,,b,,*]	0,008[a,,b,,*]	0,296[a]	0,783[a,,b]
Recruitment and selection	Chi-square	11,103	8,442	30,899	13,982	11,845	11,272	17,626	7,965
	Df	6	9	27	12	12	9	3	9
	Sig.	0,085[a,,b]	0,490[a,,b]	0,275[a,,b]	0,302[a,,b]	0,458[a,,b]	0,257[a,,b]	0,001[a,,b,,*]	0,538[a,,b]
Assessment	Chi-square	7.035	13,359	29,625	23,689	16,586	4,438	6,386	19,318
	df	6	9	27	12	12	9	3	9
	Sig.	0,318[a,,b]	0,147[a,,b]	0,331[a,,b]	0,022[a,,b,,*]	0,166[a,,b]	0,880[a,,b]	0,094[a]	0,023[a,,b,,*]
Training and development	Chi-square	8,343	11,911	28,421	9,681	18,180	22,167	4,712	9,003
	df	6	9	27	12	12	9	3	9
	Sig.	0,214[a,,b]	0,218[a,,b]	0,390[a,,b]	0,644[a,,b]	0,110[a,,b]	0,008[a,,b,,*]	0,194[a,,b]	0,437[a,,b]
Talent management	Chi-square	5,864	6,323	25,935	16,744	1,.563	3,232	1,379	15,591
	df	6	9	27	12	12	9	3	9
	Sig.	0,439[a,,b]	0,707[a,,b]	0,522[a,,b]	0,159[a,,b]	0,167[a,,b]	0,954[a,,b]	0,710[a]	0,076[a,,b]
Succession planning	Chi-square	9,646	8,090	21,802	8,099	10,529	3,102	9,108	3,452
	df	4	6	18	8	8	6	2	6
	Sig.	0,047a,,*	0,232[a,,b]	0,241[a,,b]	0,424[a,,b]	0,230[a,,b]	0,796[a,,b]	0,011[a,,*]	0,750[a,,b]
Compensation and benefits	Chi-square	10,419	11,115	28,541	9,144	15,344	5,304	2,811	4,815
	df	6	9	27	12	12	9	3	9
	Sig.	0,108[a,,b]	0,268[a,,b]	0,384[a,,b]	0,691[a,,b]	0,223[a,,b]	0,807[a,,b]	0,422[a]	0,850[a,,b]
Affirmative action and BEE	Chi-square	10,873	8,687	37,708	14,807	16,733	5,753	3,600	4,471
	df	6	9	27	12	12	9	3	9
	Sig.	0,092[a,,b]	0,467[a,,b]	0,083[a,,b]	0,252[a,,b]	0,160[a,,b]	0,764[a,,b]	0,308[a,,b]	0,878[a,,b]
Employee / Labour relations	Chi-square	3,156	6,001	28,960	5,986	8,074	5,918	2,260	18,821
	df	6	9	27	8	8	9	3	9
	Sig.	0,789[a,,b]	0,740[a,,b]	0,363[a,,b]	0,649[a,,b]	0,426[a,,b]	0,748[a,,b]	0,520[a,,b]	0,027[a,,b,,*]
Strategic HR and HR planning	Chi-square	4,332	10,010	23,874	8,722	8,290	5,444	2,175	9,032
	df	6	9	27	12	12	9	3	9
	Sig.	0,632[a,,b]	0,350[a,,b]	0,637[a,,b]	0,726[a,,b]	0,762[a,,b]	0,794[a,,b]	0,537[a,,b]	0,434[a,,b]
Productivity	Chi-	6,606	9,337	26,905	16,341	11,941	13,900	0,749	9,400

monitoring (absence, turnover)	square								
	df	6	9	27	12	12	9	3	9
	Sig.	0,359[a,,b]	0,407[a,,b]	0,469[a,,b]	0,176[a,,b]	0,450[a,,b]	0,126[a,,b]	0,862[a]	0,401[a,,b]
Personnel research and organisational development	Chi-square	10,379	5,605	34,505	19,530	10,317	8,449	3,730	23,962
	df	6	9	27	12	12	9	3	9
	Sig.	0,110[a,,b]	0,779[a,,b]	0,152[a,,b]	0,077[a,,b]	0,588[a,,b]	0,490[a,,b]	0,292[a]	0,004[a,,b,,*]
Payroll operation	Chi-square	2,406	8,642	19,364	12,597	12,001	5,830	1,998	9,110
	df	6	9	27	12	12	9	3	9
	Sig.	0,879[a,,b]	0,471[a,,b]	0,856[a,,b]	0,399[a,,b]	0,446[a,,b]	0,757[a,,b]	0,573[a,,b]	0,427[a,,b]

Results are based on non-empty rows and columns in each innermost subtable.
a. More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.
b. The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.
*. The Chi-square statistic is significant at the 0,05 level.