

Use of human resource information systems in the measurement of non-financial  
organisational success factors

by

JASON FREDERICK BONEHILL

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SUPERVISOR: PROF N MARTINS

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## DECLARATION

Student Number: **61934410**

I Jason Frederick Bonehill; hereby declare that **“Use of human resource information systems in the measurement of non-financial organisational success factors”** is my own work and that all the sources that I have used or quoted in this thesis, have been indicated and acknowledged by means of complete references. APA 7th Ed was employed in the study.



Signature

Jason Bonehill

22/02/2022

Date

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## SUMMARY

### USE OF HUMAN RESOURCE INFORMATION SYSTEMS IN THE MEASUREMENT OF NON-FINANCIAL ORGANISATIONAL SUCCESS FACTORS

by

**Jason Frederick Bonehill**

**Supervisor:** Prof. N. Martins

**Department:** Industrial and Organisational Psychology

**Degree:** Doctor of Philosophy in Psychology

**Orientation:** Organisations make use of human resource information systems (HRISs) to store data and assist with the processing of employee and other related information. This data can be a great source of information on what is happening within the organisation, but it does not appear to be utilised by industrial and organisational psychologists and organisational development practitioners when designing interventions to assist organisations. According to Schultz and Schultz (2014), the relationship between industrial psychology and systems, specifically the relationship between human factors and technological design factors, is an important area of research for industrial and organisational psychologists. No existing questionnaire or model in South Africa, however, could be found on the use of HRIS data in providing an indication of organisational success.

**Research purpose:** The general aim of the research was to develop a scientific model of organisational success factors that could be derived from HRISs and then used in organisational development Initiatives.

**Research methodology:** A questionnaire was developed on the basis of the recommended processes in the literature. This included (1) a review of the literature to determine possible organisational success factors and their possible measures, (2) developing an initial questionnaire based on the literature review, (3) conducting a pilot study for the questionnaire with willing participants to enhance its readability and ease of completion, (4) enhancing the questionnaire based on the pilot study and additional inputs received, (5) administering the questionnaire to the target population, and (6) conducting statistical analysis. The HRIS model was developed by utilising the results of the first phase of the statistical analysis and the partial least squares structural equation modelling (PLS-SEM). The questionnaire was developed on the basis of a sample of 118 employees in the Human Capital and Operational Excellence Departments within the organisation that has several companies and operates in the automotive and industrial sectors in which the research was conducted.

**Main findings:** The study resulted in the development of a psychometrically sound questionnaire and a model of organisational success. The following 11 empirically validated constructs were

identified: (1) organisational commitment and job satisfaction, (2) organisational learning and knowledge management, (3) human resource information systems, (4) mature business processes, (5) transformational leadership, (6) authentic leadership, (7) ethical leadership, (8) overall leadership influence, (9) organisational culture, (10) employee engagement, and (11) change capability.

Additionally, the model that was developed should provide practitioners with a blueprint on how to utilise HRISs and the data they house more effectively in informing and designing interventions to enhance organisational performance.

**Contribution/value-add:** The main contribution of this study was the development of a valid and reliable questionnaire on the use of HRIS data to provide an indication of organisational success, as well as the development of a model for this purpose. Specific driver constructs, namely human resource information systems, organisational commitment and job satisfaction, and organisational learning and knowledge management were identified that could, to a certain extent, provide an indication of other constructs in the model. This could contribute to the use of HRIS data by industrial and organisational psychologists and organisational development practitioners in the design of more targeted interventions to assist organisations.

**Keywords:** HRIS, organisational success factors, measures of organisational success, indicators, organisational performance, PLS-SEM, driver constructs, knowledge management, organisational learning, job satisfaction, organisational commitment

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# Chapter 1: Research Proposal

## 1.1 Introduction

The study investigated whether human resource information systems (HRISs) could be used to provide data on organisational success factors that industrial and organisational psychologists (IOPs) and organisational development (OD) practitioners could use in the development of initiatives to enhance organisational functioning. This chapter discusses the background on and motivation for the study. The paradigms underpinning and models forming the definitive boundary of the study are explained. The research process, including the methodology, choice of psychometric instruments, data analysis techniques and considerations, and ethical consideration in support of the study, are discussed. The chapter concludes with the layout of the chapters.

## 1.2 Background to and motivation for the research

The context of this study involved the use of HRISs in drawing data to provide information on organisational success factors and the use of this data in the formulation of organisational development initiatives. For IOPs and OD practitioners, the use of technology in organisations is becoming a critical aspect of fulfilling their duties (Erasmus et al., 2015). These systems are increasingly being used to manage employee-related data in organisations, both large and small, and provide information critical for decision making (Ball, 2001; Kassim et al., 2012). Hence an understanding of how these systems work and the value they can add is essential for IOPs.

Tannenbaum (1990, pp. 27–32) defines an HRIS as “the system used to acquire, store, manipulate, analyse, retrieve and distribute pertinent information regarding an organisation’s human resources”. Today, HRISs are used in many organisations to store and manage employee-related data pertaining to the definition provided. The aim is to enhance capabilities around usage of this data and to reduce the administration required in managing employee-related information.

The history of HRISs goes as far back as the 1960s where they began as simplistic systems designed to meet highly specific needs, such as the processing of salary payments to staff (Anitha & Aruna, 2013; Ball, 2001; Kassim et al., 2012; Siengthai & Udomphol, 2016). These systems have evolved over time to range in size from single systems dedicated to performing a specific task,



such as payroll management, to larger ERP systems such as SAP and Oracle that provide a range of different modules and sets of tools (Jenko & Roblek, 2016). An HRIS therefore fills a specific and increasingly important need in today's technologically advanced world, providing the tools to store and analyse information in ways that would only be possible with a significant number of man-hours spent collating it.

The promise of HRISs today is therefore that they are capable of managing vast quantities of data, reducing administration and providing decision-making tools (Ankrah & Sokro, 2012; Ball, 2001). This, in turn, frees HR and other related professionals to focus their efforts on more value-adding activities. To this end, an increasing number of organisations are investing resources in acquiring these systems. Larger organisations typically use bigger more complicated systems and modules that come with these systems to manage and utilise data in order to provide greater insight into their organisations (Ankrah & Sokro, 2012).

Anitha and Aruna (2013) discuss several benefits and uses of HRISs and advise that these systems have the potential to transform the human resources function within an organisation into a strategic partner that adds important value. With the modern focus on cost reduction, improved speed, increased accuracy and provision of usable data, an effective HRIS is essential (DeSanctis, 1986; Anitha & Aruna, 2013).

These systems afford organisations a vital opportunity to transform the way they work and put the power of drawing and using data in the hands of the customers of HR within the organisation (Siengthai & Udomphol, 2016). For any IOP and OD practitioner or HR professional it is therefore essential that they understand how these systems work to enable them to use these systems to provide data that aids them in their decision making.

There have been various studies on the implementation and acceptance of HRISs within organisations emphasising the use of models such as the Technology Acceptance Model (TAM) to ensure the best implementation and utilisation of these systems (Alam et al., 2016; Erasmus et al., 2015; Jawahar & Harindran, 2013). Part of this study was focused on the way in which these models can be used to construct a new model. The new model deals specifically with the way in which HRIS data can be extracted and used. It is therefore essential to review and analyse existing models of HRIS.

Organisational success factors were the second critical aspect of the proposed study. The goal of the study was to provide a list of these factors that could be used to indicate organisational success and the formulation of measures to be drawn from an organisation's HRIS.

The purpose of this study was therefore to formulate measures derived from organisational success factors, such as the balanced scorecard and organisational cultural elements, and then develop a model on how this information could then be drawn from an HRIS and provide an indication of the state of these factors within organisations (Arikan & Enginoglu, 2016; Leary-Joyce, 2010; Singh et al., 2016; Wang et al., 2015). The result that was envisaged was a model that could be used by IOP and OD practitioners to develop initiatives for organisations to enhance their functioning.

When reviewing the literature on organisational success, Kaplan and Norton's balanced scorecard (BSC) is an essential element to be considered (Haddadi, 2016; Singh et al., 2016). The BSC reviews four critical aspects of the organisation when measuring organisational success. These are (1) financial performance indicators; (2) customer-related outcomes; (3) innovation; and (4) internal organisational processes. The focus in the proposed study would be the internal organisational processes element.

In addition to the balanced scorecard, other models such as the Baldrige Education Criteria for Performance Excellence Framework and the EFQM Excellence Model were used to compile a list of organisational success factors. These models were chosen because they represent the most popular methods for measuring organisational performance globally (Badri et al., 2006; Van Rompuy, 2013).

Ndlovu (2010) in a study on non-financial performance measures in public companies investigated using a combination of financial and non-financial performance measures to provide a wholistic overview of organisational success. Non-financial measures such as productivity, customer satisfaction and innovation were proposed. The view of non-financial measures being needed was also supported by Oosthuizen and Fontannaz (2007) who proposed an organisations' performance be measured over three dimensions economic, social/ethical and environmental.

The Baldrige Education Criteria for Performance Excellence Model is a widely used method of measuring organisational quality. It comprises the following seven elements: (1) leadership; (2) strategic planning; (3) external stakeholder and market focus; (4) internal stakeholder focus; (4) process management; (5) organisational performance results; and (6) measurement, analysis and knowledge management (Badri, et al., 2006).

The EFQM Excellence Model is similar in nature to the Baldrige Model because it provides a method that organisations can use to review and assess their performance and quality (Van Rompuy, 2013). The model comprises two distinct sections. The first is the enablers section and contains the elements of leadership, people, strategy, partnerships and resources, and processes,

products and services.

The second section of the model focuses on results. Results are achieved when the enablers are implemented correctly within an organisation. This section has four distinct components people results, customer results, society results, and business results.

In this study, the above models' elements were utilised to compile a definitive list of organisational success factors to be measured using an HRIS. The second critical element when considering overall organisational success was organisational culture according to the literature reviewed.

Organisational culture was another critical element of the study because of its critical influence on the success of any organisation. To achieve this aim, a review of organisational culture would be conducted and discussed as characterised by Hofstede (1980), Schein (1985; 1990) and Deal and Kennedy (1982). Additional authors were also sought in terms of the relevance of their research to the proposed study (Gjuraj, 2013; Lund, 2003; Ostroff et al., 2013; Ravasi & Schultz, 2006; Schein, 2010). The aim was to provide a holistic view of organisational culture and identify a set of possible elements that could be used to measure organisational culture as a factor of organisational success.

Hofstede (1980) and Arikian and Enginoglu (2016) divided organisational culture into the following factors: (1) power distance; (2) uncertainty avoidance; (3) individualism/collectivism; (4) masculinity/femininity; and (5) short-/long-term orientation. These factors assist in categorising organisational cultures and provide a better understanding of how they function.

Schein (1985) and Moss's (2014) defined organisational culture as a pattern of basic assumptions – invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration – that has worked well enough to be considered valuable and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.

Schein's (1990) and Moss (2014) model focuses on three distinct elements of culture, namely artefacts, espoused values and basic underlying assumptions. Artefacts are what an individual sees and can feel inside an organisation and include everything identifiable to the senses. Espoused values are the foundations the organisation provides for behaviour as they drive these elements within their environment, and finally, underlying assumptions are the everyday elements of the organisation which most people take for granted.

Deal and Kennedy (1982) and Moss (2014) subdivided organisational culture into six critical

elements: (1) History is conceptualised as a shared narrative of the past; (2) as far as values and beliefs are concerned, cultural identity is formed around the shared beliefs of what is important and the values that determine what the organisation stands for; (3) Rituals and ceremonies are the things that employees do every day that bring them together; (4) corporate stories exemplify company values and capture the exploits of employees to personify these values in action. Stories allow employees to learn what is expected of them and better understand what the business stands for; (5) heroic figures are employees and managers whose status is elevated because they embody organisational values. The heroes serve as role models and their words and actions signal the ideal to aspire to; and (6) the cultural network is the informal network in an organisation where often the most important information is learnt.

A review of the literature indicates that elements of organisational culture such as leadership and communication are critical to organisational success (Arikan & Enginoglu, 2016; Badri et al., 2006; Leary-Joyce, 2010; Wang et al., 2015). Leadership and those in positions of leadership have a major effect on organisational success factors (Leary-Joyce, 2010). Leadership was an important focus of the study, as well as the data found in an HRIS that could provide an indication of the quality of leadership within an organisation.

Leadership is a critical factor to any organisation's success, but a review of organisational culture indicated that it is in fact the most critical factor (Arikan & Enginoglu, 2016; Badri et al., 2006; Leary-Joyce, 2010). The impact that leaders in the business can have on organisational culture can be both positive and negative, and of all other factors, it has the greatest influence on an organisation's culture.

Leary-Joyce (2010) described how the most significant influence leaders can have on the organisation and its culture is the way they behave. Employees in the organisation watch their leaders' behaviours, which in turn, defines the way they behave. If their behaviour is positive, it will have a positive influence, and if it is negative, it will have negative influence. The leaders' conduct is often a major reason why employees leave an organisation. Seventy percent of employees highlighted their manager as the reason for them leaving their job (Leary-Joyce, 2010). In the modern world of constant change this is a statistic that cannot be endured by many organisations if they wish to grow and expand.

In their study on the Baldrige Framework, Badri et al. (2006) discussed the vital significance of leadership and its effect on the various factors they investigated. Leadership again was identified as the single most important factor influencing organisational culture. The direction and vision good leaders provide are some of the chief findings. This reinforces what Leary-Joyce (2010)

discussed in her study and highlights that when an organisation has good leaders, who guide the organisation, drive processes and behave positively and ethically, the organisation and its employees will prosper.

On the basis of the various factors described above regarding organisational success it is believed, from the model developed, that practitioners would be able to formulate organisational development initiatives to enhance organisational effectiveness.

In conclusion, using a combination of organisational success factors and the data that was drawn from an HRIS, a model was developed to guide practitioners by providing a means of translating the data into information that could be used in formulating organisational development initiatives.

### 1.3 Problem statement

Nowadays, many organisations make use of systems to store and process employee-related data. These systems are commonly referred to as human resource information systems (HRISs). While many studies have been conducted on the use and implementation of these systems within organisations (Anitha & Aruna, 2013; Ball, 2001; Jawahar & Harindran, 2016; Kassim et al., 2012; Jenko & Roblek, 2016), there is a paucity of research on how these systems can be used by IOP and OD practitioners in their work.

Schultz and Schultz (2014) explained the relationship between industrial psychology and systems. According to them, the interaction between human factors and technological design factors such as system complexity, ergonomic layout and interface responsiveness, both during the pre- and post-implementation phases of ERP systems, are regarded as key focus areas of research and practice for IOPs.

When reviewing the literature, it became clear that the understanding and the use of HRISs, the information they store and the impact that they could have on an organisation, was lacking in the field of IOP (Siengthai & Udomphol, 2016).

The aim of the study was therefore to benefit IOPs, OD practitioners and the greater HR community by providing a model with which to draw information on key elements of organisational success. The intention was to fill the existing gap in knowledge on the use of HRISs in the formulation of solutions for organisations.

The gap deemed to have existed in the field of industrial psychology was the way in which systems were used in organisations and how they could be used in the formulation of organisational

development initiatives. This hiatus existed because of the changing nature of the way organisations operate and their ever-increasing reliance on technology to reduce administrative and time-consuming tasks, thus freeing up time for other value-adding activities.

For IOPs and OD practitioners, understanding how these systems work and the information they can provide is crucial in developing and implementing organisation-wide solutions to improve functioning. Without a sound understanding of these systems, IOPs and OD practitioners fail to utilise a crucial source of information on organisational success.

### 1.3.1 Literature review questions

The purpose of the literature review questions was as follows:

- To provide background on HRISs in South Africa
- To conceptualise the uses of HRISs in organisations from a theoretical perspective
- To conceptualise the construct of HRIS used to provide information on key measures of overall organisational success from a theoretical perspective
- To conceptualise the constructs of HRIS organisational culture, leadership, internal organisational processes and other constructs extracted from additional models on organisational performance and determine their key components from a theoretical perspective
- To develop a theoretical model of measures based on organisational success factors derived from HRISs

### 1.3.2 Empirical questions

The purpose of the empirical questions was as follows:

- To develop a questionnaire to measure the need for the use of HRIS data and measure the measures of organisational success factors and the factors themselves
- To measure the constructs of HRIS, organisational culture, leadership, internal organisational processes and other constructs extracted from models on organisational performance and determine their key components

- To determine and test the empirical relationship between the construct of HRIS and measures based on organisational success factors for organisational development initiatives
- To assess whether biographical variables play a moderating role in the use of HRISs to derive metrics and the measurement of organisational success factors
- To develop and test an empirical model for HRISs and measures by means of structural equation modelling on organisational success factors

## 1.4 Aims of the research

### 1.4.1 General aim

The general aim of this research was to develop a scientific model of organisational success factors that could be derived from HRISs and then used in organisational development Initiatives.

### 1.4.2 General research question

The general research question was formulated as follows: To what extent could a scientific model of organisational metrics based on organisational success factors be derived from HRISs?

### 1.4.3 Specific aims

The specific literature aims were formulated as follows:

- To provide background on HRISs in South Africa
- To conceptualise the uses of HRISs in organisations from a theoretical perspective
- To conceptualise the constructs of HRIS, organisational culture, leadership, internal organisational processes and other constructs extracted from additional models on organisational performance and determine their key components from a theoretical perspective
- To develop a theoretical model of measures based on organisational success factors derived from HRISs

The specific empirical aims were formulated as follows:

- To develop a valid and reliable questionnaire to measure the need for the use of HRIS data and organisational success factors

- To measure the constructs of HRIS, organisational culture, leadership, internal organisational processes and other constructs extracted from models of organisational performance and determine their key components
- To determine and test the empirical relationship between the construct of HRIS and measures based on organisational success factors
- To assess whether biographical variables play a moderating role in the use of HRISs
- To develop and test an empirical model for HRISs and measures by means of structural equation modelling
- To make recommendations for the discipline of industrial and organisational psychology and human resource management on HRISs and measures based on organisational success factors for future research

### 1.5 The paradigm perspective

A research paradigm or worldview is defined by Creswell (2009, p. 6) as a “general orientation about the world and the nature of research that the researcher holds”. The worldview is therefore the lens or perspective through which the research is conducted and is generally presented with the elements of ontology, epistemology and methodology. Ontology refers to the nature of reality. Epistemology focusses on how we are able to understand that we know what we know, and methodology is the research process that we follow (Creswell, 2009; Terre-Blanche et al., 2006)

The worldview adopted for the study was that of pragmatism. The pragmatic approach concentrates specifically on the effects emanating from actions and related situations, with the focus on finding a solution to a problem and what can be used in that pursuit. The principles underlying pragmatism are as follows: (1) Pragmatism is not committed to any one research philosophy or system and therefore uses elements from both qualitative and quantitative research; (2) The researcher has freedom of choice in terms of techniques and methods and procedures; (3) Pragmatists do not see the world as an absolute unity; (4) Truth is what works at the time; (5) The pragmatist researchers look to what and how to research, based on the intended consequences – where they wish to go with it; (6) Pragmatists agree that research always occurs in social, historical, political and other contexts; and (7) Pragmatists believe in an external world independent of the mind as well as that lodged in the mind (Creswell et al., 2009).

Ontology for the pragmatic paradigm is where reality is reviewed and understood in terms of its use in different situations and contexts. Epistemology focusses on the creation of knowledge



based on the relationship between people and their environments and methodology in a pragmatic paradigm includes the use of mixed-methods research that is action and design oriented (Allemang et al., 2022).

Based on the overall definition and underlying principles of pragmatism, it was believed to be the best suited paradigm for the study. This is primarily due to the nature of the study conducted whereby a combination of qualitative and quantitative elements, techniques, methods and procedures was needed to create the model, as well as freedom to use what was deemed necessary to complete the study.

The study was conducted within the discipline of industrial and organisational psychology and relates to the subdiscipline of organisational development.

Industrial psychology is a discipline of psychology that focuses on the application of psychological theories and principles to the workplace (Levy, 2013). Industrial psychologists, in turn, focus on the enhancement of organisations, teams and individuals through the application of these theories and principles.

Cummings and Worley (2008, p. 9) defined organisational development as “a system wide application and transfer of behavioural science knowledge to the planned development, improvement, and reinforcement of the strategies, structures, and processes that lead to organisation effectiveness”. Through this process initiatives can be designed that aim at making the organisation, its teams and its employees function better.

The literature review of HRISs, organisational success factors and organisational development initiatives was conducted from the humanistic perspective.

The humanistic perspective, according to Watson and Schneider (2016), deals with the following primary assumptions: (1) the importance of an individual’s subjective experiences, specifically phenomenology; (2) humans being capable of evolving and growing; (3) humans being able to reflect on their experiences and choose different courses of actions; and (4) humans as unique and valuable beings. This paradigm was applicable to the study because individuals and their unique perspectives would assist in the development of the model. The literature review therefore needed to take this into account when elements of the theoretical model were identified and defined.

## 1.6 Contribution at a theoretical, practical, and empirical level

An important element of the research to be conducted is to ensure that a contribution is made at both a theoretical and empirical level. This section provides a high-level overview of how this was

achieved.

The study sought to make a theoretical contribution as follows:

- the provision of a list of possible organisational success factors, as identified from a review of the literature
- the identification and proposal of a list of possible measures for the organisational success factors through a review of the literature
- the creation of a conceptual model based on the review of the possible organisational success factors and their possible measures

The empirical level contribution of the study was as follows:

- To develop a valid and reliable questionnaire to measure the organisational factors and their measures identified and the need overall to use HRIS data
- To create an empirically tested and refined model on the use of HRIS data to provide an indication of the presence of organisational success factors within an organisation

The practical level contribution of the study was as follows:

- To provide a better understanding of HRISs and their correlation with constructs for organisational success.
- To assist OD and IOP practitioners in the better use of the significant amount of information stored in HRISs to provide insights and inform decision making
- To provide practitioners with a method to draw data drawn from an HRIS that can be used to indicate the presence of certain constructs, and that this, in turn, can be used to explain the presence of other constructs to an extent that is not as easily measured with data drawn from an HRIS
- The model to be created should provide practitioners with a blueprint on how to utilise HRISs and the data they house more effectively in informing and designing interventions to enhance organisational performance

## 1.7 Meta-theoretical concepts

In the empirical context, the study was based on models and theory in relation to the variables identified. In the disciplinary context, the research focused on industrial and organisational psychology as a field of application. The following meta-theoretical statements were relevant to the study:

**Human resource information systems** – Tannenbaum (1990) defined HRIS as the system used to acquire, store, manipulate, analyse, retrieve and distribute pertinent information on an organisation's human resources. The concept of HRIS was of critical importance to the proposed study. It is essential that a clear understanding of the concept was necessary. Tannenbaum's (1990) definition was therefore chosen as it is concise and provides an excellent description of the core of any HRIS.

**Organisational success factors** – This can be defined as a set of both financial and nonfinancial indicators capable of assessing the degree to which organisational goals and objectives have been accomplished (Kaplan & Norton, 1992). The concept of organisational success factors was the second critical component of the proposed study. Organisational success factors were used as the foundation for the construction of elements to be measured by an organisation's HRIS. Hence Kaplan and Norton's (1992) definition was deemed an effective overall description of this key concept.

**Organisational culture** – Schein (1985) defined this concept as a pattern of basic assumptions – invented, discovered or developed by a given group as it learns to cope with its problems of external adaptation and internal integration – that has worked well enough to be considered valuable and therefore to be taught to new members as the correct way to perceive, think and feel in relation to those problems.

## 1.8 Literature review

According to Creswell (2009; 2014) and Eyisi (2016), there are several key steps in any literature review. The first key step is the identification of key words that can be used in the search for the relevant and value-adding material. This should focus on words that are important to the research being undertaken and the areas of focus. The next step is to identify the location of the materials related to the key words. These could include journals and books, as well as electronic material that can be accessed on databases. The aim is to ensure that the researcher understands where they can focus their efforts to gather the required materials.

The third step in the process involves gathering 50 sources of material in the previous identified locations using the key words identified. The next step is to review the material gathered to

determine its relevance to the study and whether it will make a contribution. Evaluating the quality of the information gathered is important in this step to ensure that the information will assist the researcher with their research. The fifth step recommended in the process is the design and creation of a literature review diagram to allow for the review to be planned logically and in a structured way. Once the information has been reviewed in the sixth step in the process it should be summarised for later reference and referral, thereby assisting in identifying the important information required for the research.

The literature review first sought to establish an understanding of HRISs and their functioning, use in organisations and contribution to organisational success. Models of HRIS were then reviewed and explained as they related to the study.

The second main section of the literature focused on the organisational success factors and sought to identify those factors that could be used in conjunction with HRIS. The authors reviewed included Kaplan and Norton and Hofstede. Important factors that contributed to organisational success such as culture and leadership received specific attention during the literature review.

The third and fourth sections of the literature review focused on the two most critical aspects of organisational success, namely leadership and organisational culture. This section sought to provide a greater understanding of these two factors of organisational success and how they are constituted.

A brief final section was added regarding organisational development initiatives, and contained basic information on their components and data typically used in their formulation and execution.

## 1.9 Research design

Creswell (2009, p. 3) defined a research design as the “plans and procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis”. A research design is selected for a study based on the problem the researcher is attempting solve, as well as factors such as the researchers’ frame of reference and the composition of those involved in the study.

According to Creswell (2009; 2014; Robson, 2002), research designs have three distinct components, namely a philosophical worldview, the strategy of enquiry and the specific approaches for the practical research.

A philosophical worldview as defined by Creswell (2009, p. 6) is “a general orientation about the world and the nature of research that a researcher holds”. The worldview is therefore simply the

researchers' perception and the lens through which they see the world, and as it relates to the study of the research itself.

The strategy of enquiry is the second component of a research design and gives direction to the study as it relates to the way in which the research is to be conducted.

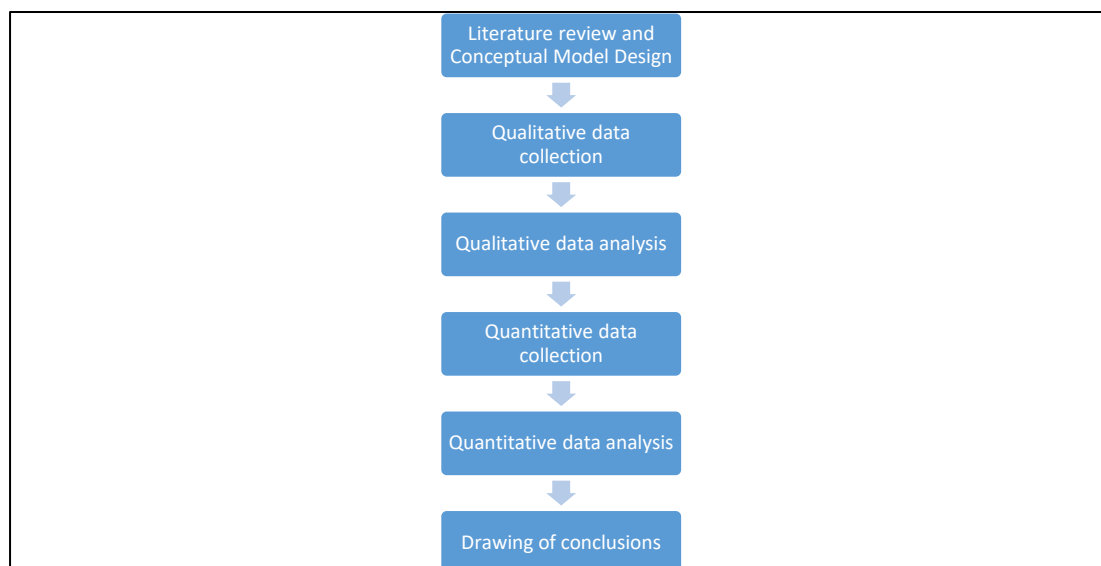
The last component of a research design is the research method to be used in the collection, analysis and understanding of the data (Creswell, 2009; Robson, 2002). These methods vary according to the nature of the research being conducted, as well as the data that needs to be collected and analysed. In terms of the proposed mixed-methods strategy for this study, there are several ways in which data could be collected and analysed (Creswell, 2009; Tashakkori & Teddlie, 2010). These include open- and closed-ended questions and questionnaires for data collection, and statistical and text analysis for the data analysis element.

### 1.9.1 Research approach

The research approach to be used was mixed methods and specifically sequential mixed methods (Creswell, 2009; Tashakkori & Teddlie, 2010). The process that was followed for the data collection and analysis components of the study is depicted in figure 1.1.

**Figure 1.1**

*Research Process*



The study was conducted using both the qualitative and quantitative research approaches. The first phase of the study focused on the literature review and design of the conceptual model. The second

phase focused on the qualitative aspect of data collection, analysis and model refinement. The third phase related to the quantitative aspect of the data collection, analysis and model refinement.

### 1.9.2 Research strategy

The mixed-methods research strategy chosen for the study was the sequential exploratory strategy (B) (Equal Status Qual – Quan). This strategy focused first on the qualitative phase of the study in which data was collected in the form of qualitative interviews with the participants, and then analysed qualitatively. The second phase involved quantitative data collection and analysis that built on the information collected and analysed during the qualitative phase of the research. (Creswell, 2009; Saunders et al., 2007).

### 1.9.3 Research method

According to Creswell (2009) and Robson (2002), the research method used in a study involves collecting, analysing and understanding information. These methods vary according to the nature of the research being conducted, as well as the data that needs to be collected and analysed. In terms of the mixed-methods strategy for this study, there were several ways in which data could be collected and analysed (Creswell, 2009; Tashakkori & Teddlie, 2010). These included open- and closed-ended questions, questionnaires for data collection and statistical and text analysis for the data analysis aspect of the research.

#### 1.9.3.1 Research setting

The research setting was a large corporate organisation with approximately 200 staff members in the HC, OD and Learning and Development, and Operational Excellence departments. This site was chosen as the researcher worked at the organisation, had direct access to information and could readily engage with the selected participants during the study.

The study did not disrupt any normal functioning within the different departments and was executed in such a way that the participants were able to complete the questionnaire designed during working hours.

### *1.9.3.2 Entrée and establishing researcher roles*

Permission was sought from the Group Executive: Human Capital and Transformation to access staff in the organisation and gather information. Each participant in the study was also then requested to sign a consent form in line with the Health Professions Councils of South Africa's (HPCSA's) standards and requirements. Ethical guidelines, as stipulated by the HPCSA and the Department of Industrial and Organisational Psychology at the University of South Africa (Unisa) formed the basis of the study. Ethical clearance to conduct the study was granted by the Research Committee of the Department of Industrial and Organisational Psychology at Unisa. Informed consent was obtained from the participants and all the data and results were handled confidentially.

### *1.9.3.3 Sampling*

Sampling for the research was conducted in two stages, namely a qualitative phase in which the model and questionnaire to be used were formulated, and a quantitative phase in which the formulated model was tested statistically.

The first sampling approach was in line with the qualitative sampling strategies and the individuals were purposefully selected to participate based on their location, level of education and involvement with the elements that formed part of the study. Other characteristics used to select participants were their race, gender, age, occupational level, duration with the organisation in which they worked and duration in their current role. At least 10 interviews, or until the data became saturated, were conducted during the data collection phase to gather as much information as possible.

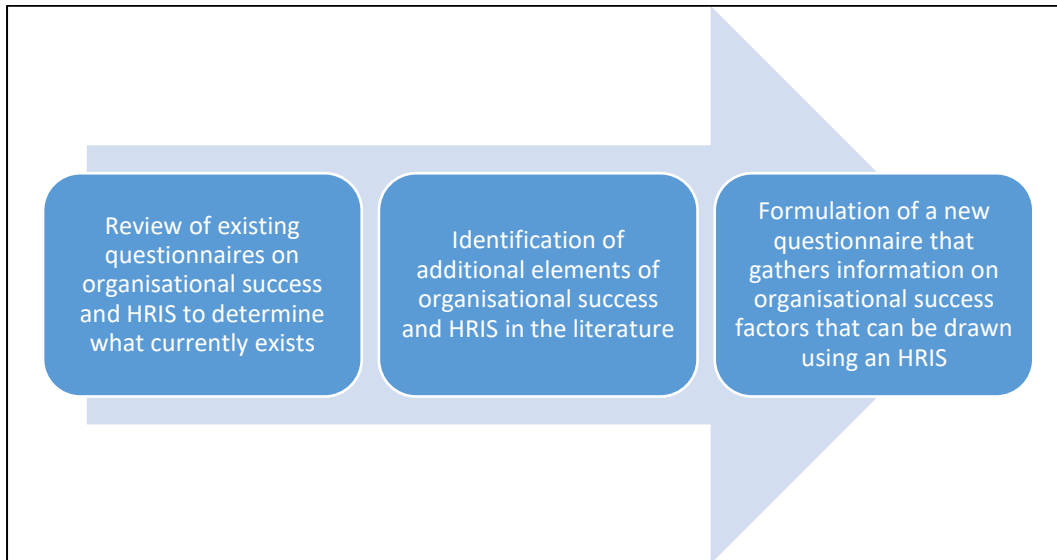
The second sampling approach was in line with quantitative sampling strategies, with the random sampling or probabilistic sampling strategy being selected. This strategy was used to select participants from the organisation in which the researcher worked. Each employee and member in the prospective sample had an equal chance of being chosen. A level of stratification was used when identifying the sample for the quantitative phase of the study to ensure that the participants had characteristics that could be generalised. These included, inter alia, their race, gender, age and occupational level.

#### 1.9.3.4 Data collection methods

The method followed for the development of the questionnaire is depicted in figure 1.2.

**Figure 1.2**

*Questionnaire Development*



The methods used in the collection of data involved two distinct phases. The first phase focussed on the qualitative part of the study and qualitative interviews were used as the means to collect data. These interviews were held with the participants and involved the use of open-ended and semi-structured questions. The aim of these questions was to allow the participants to share their views on the topic being investigated

The second phase focussed on the quantitative part of the study. A questionnaire was designed and administered electronically on the basis of the theoretical model formulated. Participants were then able to rate the items in the questionnaire online and submit the questionnaire once they had rated all the items. Participants were also able to come back to where they had left off if they needed to log out of the tool and then return to complete the questionnaire.

On the strength of the literature reviewed, several questionnaires were identified that determine how HRISs are implemented, used and accepted in organisations and how they contribute to organisational success (Alam et al., 2016; Kassim et al., 2012; Siengthai & Udomphol, 2016; Wang et al., 2015). It was determined that by including elements of these questionnaires, as well as the addition of elements found in the literature on HRISs and organisational success factors, a comprehensive questionnaire could be compiled.



The literature on organisational success factors revealed that several questionnaires had been developed, and elements of these could be used in the formulation of a new questionnaire. These included the Baldrige Excellence Framework questionnaire as discussed by Badri et al. (2006). The questionnaire developed by Wang et al. (2015) in determining the quantitative determinants of organisational success was also the focus of the development of a new questionnaire on organisational success factors and HRISs.

#### 1.9.3.5 Recording of data

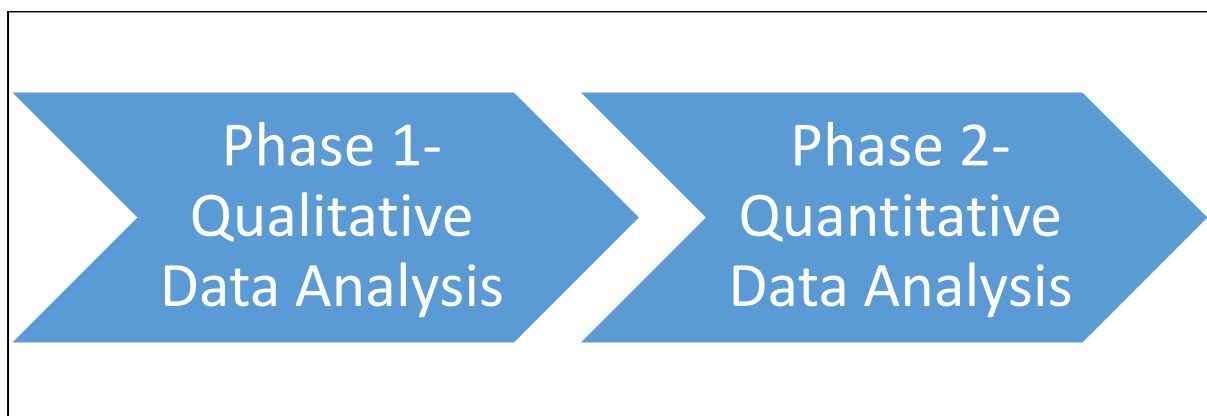
Data was recorded for each of the approaches. In the qualitative phase recording was completed by taking notes during the interviews and by making and securely storing Zoom recordings of each of the interviews conducted. For the quantitative phase recording was completed by using a database with respondents' answers that was created and questionnaires were stored electronically with password protection. The database was used for further data analysis.

#### 1.9.3.6 Data analysis

The high-level data analysis process for both data analysis phases of the research is depicted in figure 1.3.

**Figure 1.3**

*Data Analysis Phases*



The information collected was analysed in two distinct data analysis phases of the study. The first phase of data analysis focused on the analysis of information collected during the qualitative second phase of the study. In this phase, information that was collected was analysed inductively using

categorisation and text analysis in line with existing qualitative data analysis techniques, more specifically the use of thematic content analysis to structure the information collected and develop overall themes with the assistance of coding the information collected. Several software packages currently exist that assist with the coding of qualitative data collected. These were reviewed and the most suitable package was selected to help achieve the aims of the study.

The second phase of the data analysis occurred after the qualitative phase of the study had been completed, building on the results of the qualitative data analysis conducted and focused on the analysis of information collected during the quantitative third phase of the study. During this phase, a descriptive statistical analysis was conducted, followed by inferential statistical analysis. The program, Statistical Package for the Social Sciences (SPSS) version 27, was used for the analysis.

Onwuegbuzie and Combs (2017, p. 5) defined descriptive analyses and inferential analyses as follows:

techniques that are used to organize and summarize data for the purpose of enhancing understanding. In contrast, inferential analyses are techniques that are used to make predictions or judgments about a population based on the characteristics of a sample obtained from the population (i.e., making generalisations from a sample to the population from which the sample was selected). Descriptive analyses yield single-quantity-based statistics and exploratory-based statistics.

Descriptive statistical analyses were therefore used to summarise the data collected and stored in a specific way to obtain various statistics on the sample used in the study. Inferential statistical analyses were then conducted to derive parameters to allow generalisations of the findings of the study.

Statistical analysis during this part of the study involved correlation analysis to determine the correlation between the various questionnaire elements. The type of factor analysis was determined once data had been collected. Multivariate structural equation modelling was then used to confirm the factor structure and test the theoretical model. Hierarchically moderated regression analyses, also known as cluster analyses, were applied to empirically examine whether certain group biographical variables had an influence on the nature of the correlation between the independent and dependent variables.

Structural equation models consist of observed and latent variables, whether independent or dependent. Latent variables, constructs or factors are variables not directly observable or measured. They are indirectly observed or measured and inferred from a set of observed variables that have been measured by means of tests or surveys. By contrast, measured or indicator variables

are a set of variables used to define or infer a latent variable or construct, and they produce a measured score (Schumacker & Lomax, 2010, pp. 2–3). An independent variable, unlike a dependent variable, is not influenced by any other variable in the model (Schumacker & Lomax, 2010, p. 3).

#### *1.9.3.7 Ensuring reliability and validity of the data collected*

Since a mixed-methods approach was adopted in this study, a list of the steps that were followed to ensure the validity and reliability of the data collected is provided below. First the data validation of the qualitative data is discussed, followed by a review of the quantitative data validation steps:

Qualitative data validation (Creswell, 2009):

- Document the procedures and steps used in the study to ensure consistency and thus the reliability of the data collected. The following steps were also followed to ensure reliability:
  - Checking the documents used for data collection for any errors or identifiable mistakes
  - Establishing a consistent definition of the codes identified and applying them in the study
  - Using another researcher to check the codes developed to ensure that consistent coding is applied in the research, in order to achieve 80% consistency of coding
- Ensure that the data are valid by adhering to the following procedures:
  - Triangulating different data sources to determine whether the themes created are valid
  - Using the research participants to review the results of the themes and codes developed to confirm that they agree with the results
  - Considering multiple perspectives and views on the topic under investigation
  - Reflecting on any potential bias that might affect the researcher in the collection and analysis of the data
  - Presenting views and opinions that do not line with the findings

Quantitative data validation was also conducted in accordance with the guidance provided by Creswell (2009; 2014) and Terre-Blanche et al. (2006). The validation and reliability of the instrument were statistically determined using the data that had been collected and analysed. The items for the instrument had to be constructed because the instrument was new and not based on any existing instruments, and the validity and reliability therefore needed to be determined.

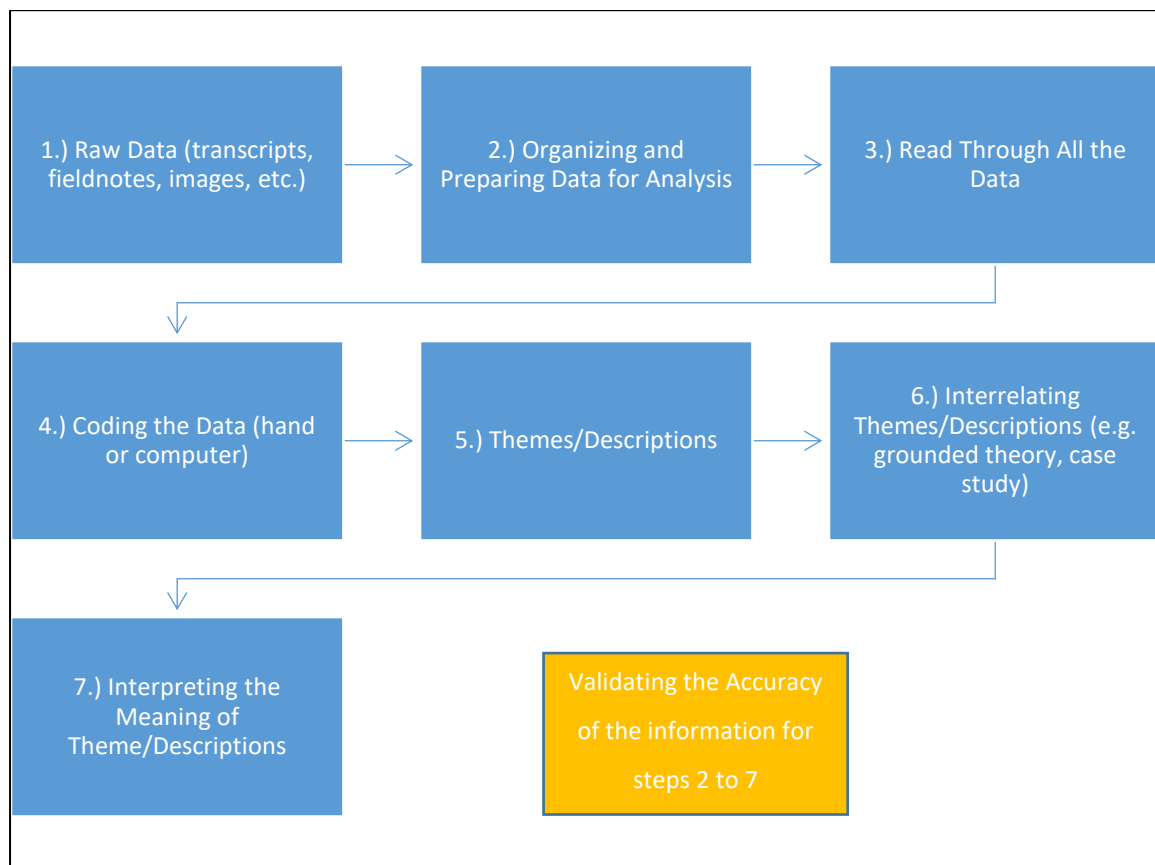
External and internal threats to data validity were then identified and removed from the study to ensure that the results of the analysis could be generalised to the involved groups and settings. Statistical threats to validity were removed by ensuring that the correct statistics were used.

1.9.3.8 *Strategies employed to meet ethical considerations*

The process as described by Creswell (2009) for the analysis of qualitative data is depicted in figure 1.4.

**Figure 1.4**

*Qualitative Data Analysis Process*



*Note.* Qualitative data analysis. From *Research Design Qualitative Quantitative and Mixed Methods* (3<sup>rd</sup> ed.) (p. 185), by Creswell, 2009, Sage

To ensure that the overall ethical considerations were met for the study, each respondent was asked to complete a consent form to allow for the use of the data and a commitment was made to provide feedback to the respondents if they requested it. Ethical guidelines, as stipulated by the HPCSA and

Unisa's Department of Industrial and Organisational Psychology, formed the bases of the study. Ethical clearance to conduct the study was applied for and granted by the Research Committee of the Department of Industrial and Organisational Psychology. Informed consent was obtained from the participants and all the data and results were handled confidentially.

During the qualitative phase, all the processes used and the steps taken were documented. This included transcription of the interviews conducted and the audio recordings. A standard definition of codes was then developed during the codification process.

The quantitative data analysis phase made use of statistical analysis on the model designed to test its validity and reliability. The sample guidelines for PLS-SEM were used, namely 10 times the number of independent variables, and the guidance provided by Cohen (1988) and Goodhue et al. (2011).

#### *1.9.3.9 Reporting*

As this was a mixed-methods study, the reporting styles for both qualitative and quantitative research were used in the presentation of the information and findings. The qualitative phase of the study was conducted first, and once that data had been gathered and analysed, it was reported on separately. The quantitative phase of the study then commenced, following the same process.

During the qualitative phase of the study, the data was reported using a descriptive style whereby the themes identified from the first part of the study were used to categorise and explain the data collected.

During the quantitative phase of the study, the data was reported making use of visual aids to provide details on the information collected and the findings. This included the use of tables to provide data on the instrument used and the statistical analysis employed on the data gathered. Other visual aids such as pie or bar charts were also employed to provide more information on the data.

Both sections' results were compared and analysed against the literature review section of the study to better understand the information gathered and draw important conclusions.

## 1.10 Chapter layout

Chapter 1: This chapter provided the scientific orientation to the research, focusing on the background to and motivation for the study, the problem statement, the research questions and aims, the paradigm perspective, the meta-theoretical concepts, high-level overview of the research process and research strategy, approach and method.

Chapter 2: This chapter deals with HRISs, discussing these systems in detail as well as their history, different types, functions and benefits, and a review of existing HRIS models, including the strengths and weaknesses of each. Trends in HRISs are highlighted and possible measures for HRISs proposed.

Chapter 3: This chapter focuses on organisational success factors and provides a definition of organisational success, discussing three main factors, specifically job satisfaction and organisational commitment, organisational learning and knowledge management, and internal business processes. Possible measures of each of the factors are then proposed.

Chapter 4: In this chapter on organisational leadership, leadership is defined and two of the core influences of leadership and several major types of leadership discussed. Possible measures of leadership are then proposed.

Chapter 5: This chapter on organisational culture provides a definition of culture, reviews three of the main influences of culture, different models of organisational culture, and proposes a list of possible measures of culture. The conceptual model is also discussed, that is, the model created from a review of the literature. A summarised list of all the possible measures for organisational success factors, as discussed in the previous chapters, is also provided.

Chapter 6: This chapter deals with the research design and provides details of the research approach adopted. It focuses specifically on explaining mixed-methods research, and the qualitative and quantitative phases of the research.

Chapter 7: This chapter presents to the results and findings of the qualitative research. The output from the qualitative phase of the research, the strategies adopted to enhance the quality of the research, the themes and subthemes identified and the refinements made to the conceptual model in this phase of the research, are discussed in detail.

Chapter 8: This chapter focuses on the results and findings of the quantitative phase of the research. It contains an analysis and explanation of the demographic profiles of the sample, the way in which validity and reliability were established, the constructs utilised and the results of the various statistical analyses that were conducted.

Chapter 9: In the final chapter, conclusions are drawn, the limitations of the research are highlighted and recommendations are formulated for possible future research.

## Chapter 2: Human Resource Information Systems

### 2.1 Introduction

Nowadays, many organisations make use of systems to store and process employee-related data. Many industrial psychology and organisational development practitioners do not appear to understand how these systems function based on the researcher's experience. These systems are commonly referred to as human resource information systems (HRISs) or human capital management systems (HCMSs). While many studies have been conducted on the use and implementation of these systems within organisations (Anitha & Aruna, 2013; Ball, 2001; Du Plessis & De Wet Fourie, 2016; DiClaudio et al., 2018; Berger, 2014; Jain, 2014; Jawahar & Harindran, 2013 & 2016; Kassim et al., 2012; Jenko & Roblek, 2016; Jones, 2016; Qaisar et al., 2018; Udekwe & de la Harpe, 2017), there is a paucity of research on how these systems can be used by industrial psychologists and organisational development practitioners to indicate the success of an organisation.

This chapter discusses key aspects of HRISs/HCMSs to ensure a better understanding of these systems, such as their capabilities, complexities, their history and types of HRISs, the benefits and uses of HRISs, conceptualisation and key components of HRISs, and trends and new developments.

In reviewing the literature on HRISs, Tannenbaum (1990) is frequently cited to obtain a comprehensive definition of an HRIS. This definition is included below.

Tannenbaum (1990) defines an HRIS as a system used to acquire, store, manipulate, analyse, retrieve and distribute pertinent information on an organisation's human resources. This definition, although older, remains relevant in its description of today's more powerful HRISs or HCMSs.

The primary reason for repeating the definition of an HRIS formulated in 1990 is that it is still being cited decades later because of its continued relevance to the field. When examining Tannenbaum's definition, it can articulate what an HRIS was designed for in simple terms in order to provide any researcher with a greater understanding of the scope of these systems and their uses.

When reviewing the literature on HRISs, several other definitions were identified that are also believed to provide a greater understanding of these systems and their capabilities. The different definitions identified are highlighted below.

- Kavanagh and Thite (2009, p. 17) synthesised the definition of an HRIS as "a system used to acquire, store, manipulate, analyze, retrieve, and distribute information regarding an organisation's human resources to support HRM and managerial decisions".



- Broderick and Boudreau (1992) defined HRIS as the composite of databases, computer applications, hardware and software that are used to record, store, manage, deliver, present and manipulate data for human resources.
- Jain (2014) defined an HRIS as the systematic approach to storing, updating and retrieving information stored as data items, usually in the form of records in a file, whereby many users, on even many remote installations, can use common databases.

From an analysis of the above definitions common elements such as loading, storing, management, analysis and extraction of data can be identified. An HRIS is therefore more than just a repository of information, but rather a tool that when used as intended can add significant value to any organisation.

Schultz and Schultz (2014) explained the relationship between industrial psychology and systems as follows: the interaction between human factors and technological design factors such as system complexity, ergonomic layout and interface responsiveness, both during the pre- and post-implementation phases of ERP systems, are regarded as key focus areas of research and practice for industrial and organisational psychologists (IOPs). It is therefore crucial for IOP and OD practitioners to gain a greater understanding of these systems to fully utilise this vital source of information on organisational success.

Ulrich (1997) and Anitha and Aruna (2013) argued that technology will change how work is done in general and how human resources (HR) is practised. These days, an HRIS therefore holds the promise of reducing administrative- intensive tasks and providing the HR user with the ability to focus on more value-adding activities for the organisation. The aim of this chapter was therefore to provide an understanding of an HRIS by discussing its history, the different types, the benefits and the existing research models.

## 2.2 History and types of HRISs

HRISs go back as far back as the 1960s where they began as simplistic systems designed to meet exceedingly simple and specific needs. These included storing basic information and processing salary payments to staff (Anitha & Aruna, 2013; Ball, 2001; Jawahar & Harindran, 2013; Kassim et al., 2012; Siengthai & Udomphol, 2016). These systems, however, have evolved over time to range in size from a single specialised system used in a part of the organisation and dedicated to performing a specific task, to larger ERP systems such as SAP and Oracle that provide a range of different

modules and sets of tools designed to provide better control, management and analysis of data (Jenko & Roblek, 2016).

An HRIS therefore fills a specific and increasingly important need in today's technologically advanced world, providing the HR function with the tools to store and analyse information they manage in ways that would only be possible with a significant number of man-hours spent collating it. It is this possible storage, collation, analysis and interpretation of data that provides HR with information that can be used to inform overall HR and business strategy for the organisation.

### 2.2.1 Types of HRISs

As society continues to advance technologically, so to do the various HRISs available to organisations to better manage and analyse the ever-larger amounts of data they accumulate. This section will provide a better understanding of the various types of HRISs available, what they do and the benefits that can be derived from their use.

Unlike a few decades ago when there was only a small selection of HRISs to choose from, today there are dozens of systems that organisations can select that perform a variety of functions. These systems range in size and complexity from single functional systems to enterprise resource planning (ERP) systems that provide a range of functions to many of the organisation's structures and provide data for business purposes.

Organisations too vary in terms of their size and complexity and seek out the best technology they can afford to provide them with a competitive advantage over their rivals. Size is important for an organisation because it influences what HRIS organisations will eventually select, what modules on the system will be required and how extensively they will be used (Ankrah & Sokro, 2012; Ball, 2001). The overall aim is to select a system that aligns with the organisation's strategy and provides the necessary tools to inform business decisions.

To cater for the differing requirements of organisations, several dozen HRISs are now available in the market. These systems perform a range of functions and come in a variety of shapes and sizes. From a review of the literature, three broad categories of HRISs have been identified and are as follows: (1) single HRIS-focussed systems; (2) modular HRISs; and (3) cloud-based and ERP systems.

### *2.2.1.1 Single HRIS-focused systems*

During the early 1960s and 70s, HRISs were simply designed programmes that could provide limited functions such as the storage of basic information (Anitha & Aruna, 2013). This has changed over the last several decades, with the result that designed programmes are more powerful and provide a range of services in their area of specialisation.

A single focused system is one that provides functionality around one area of specialisation such as performance, leave, and training and development. In many instances, these systems are designed to accommodate, store, utilise and analyse information to assist HR professionals make informed decisions (Kassim et al., 2012). These uses may include the provision of trend analysis on leave patterns, a greater overview of the performance levels of employees and the training most often conducted in the organisation and during which times of the year.

### *2.2.1.2 Modular HRISs*

Systems that are commonly used in many organisations are described as modular. A modular system is a standalone program that has several addable or removable modules that allow for data to be stored and used in multiple ways and across multiple aspects of a function such as HR. Many of these systems are categorised as transactionally based, meaning that they rely on a user to load data into the system such as training attended or the career progression of an employee as data (Anitha & Aruna, 2013; Kassim et al., 2012).

Companies such as SAGE specialise in these systems primarily with programs being offered to clients that allow them to store and process multiple types of data. Using various modules of their systems the information can then be used in reporting and analysis, and to display dashboards and other relevant graphics to assist with business decision making (Jawahar & Harindran, 2013). A modular system usually has a core function such as the managing of basic HR data, and then through the addition of various modules such as performance, training and equity reporting, to name a few, they would provide additional ways to store and process information.

Overall, these modules would then enhance reporting for the business, reduce HR administration and afford HR professionals the opportunity to analyse multiple sets of data stored in one central location. These systems' primary benefit is therefore to provide a central location to store

information and through the various modules analyse information in ways that is not possible on single function systems (Anitha & Aruna, 2013).

### *2.2.1.3 Cloud-based offerings and enterprise resource planning (ERP)*

As the world continues to change and technology evolves, newer solutions are being developed and built constantly. One of these newer solutions for HRISs is the offering of cloud-based systems. An increasing number of software companies are providing cloud solutions to clients that offer a range of benefits, such as reducing the costs of software purchase and hosting, increased computer and processing power, increased security, and a reduction in client backups that need to be made. :

Cloud-based offerings enable users to access the HRIS by way of any computer with an internet connection (Anitha & Aruna, 2013). The user is then authenticated through a range of methods such as the issuing of a specific username and password or the use of Windows authentication. This offering is becoming more prominent in the South African market and will continue to provide further benefits in the future as it becomes more established.

An ERP system provides clients with a total organisational system solution and covers a range of functions, including but not limited to HR, finance, procurement and reporting (Anitha & Aruna, 2013; Jenko & Roblek, 2016; Siengthai & Udomphol, 2016). These systems are more typically found in larger organisations with the capability to make the investment required to implement the system (Ankrah & Sokro, 2012; Ball, 2001). An ERP, like the other systems already discussed, has been designed to realise the same benefits as other systems but with increased capabilities. These increased capabilities relate to an ERP's complexity, size and functionality (Jenko & Roblek, 2016).

From a complexity perspective, ERPs cater for many different functional areas and not just a single area such as learning and development. They are designed to provide a solution to the entire organisation and collate data across several functional areas. The result is several dozen different users utilising the system for a variety of purposes (Jenko & Roblek, 2016).

From a size perspective, ERPs are large powerful systems and can rapidly store, manage, analyse and process enormous amounts of data. They are designed with several large modules that can then provide additional ways to store, manage and analyse information (Anitha & Aruna, 2013).

The functionality of an ERP is one of its standout elements, with the ability to take data stored for multiple functions and provide analysis thereof, being one of the most powerful. This type of

analysis allows users to combine data from several different functions ranging from finance, procurement, HR and payroll to name a few, and provide a unique perspective on things such as the organisation's employees and business activities, identify trends with their workforce and identify areas requiring attention. This data can then be used by decision makers to inform their choices and thus the organisation's strategy (Anitha & Aruna, 2013).

## 2.3 Functions and benefits of HRISs

Nowadays, HRISs come in many shapes and forms and provide a range of functionality and benefits to the systems' intended users. This section provides clarity on the various functions and benefits of a successfully implemented HRIS that were identified in a review of the literature. These benefits include a reduction of administration and streamlining of work, being a repository of information and assisting with compliance, and reporting and analysis.

### 2.3.1 Reduction of administration and streamlining of work

Arguably the main reason for the implementation of any HRIS is to reduce the amount of administration that needs to be performed by the intended users. To achieve this aim, many systems, ranging from single focused systems to ERPs, have been designed to provide mechanisms to load, manage and extract information and thereby reduce the time and effort required from the users to accomplish these tasks (Anitha & Aruna, 2013; Ankrah & Sokro, 2012; Ball, 2001; Jain, 2014; Jawahar & Harindran, 2013; Jones, 2016; Kassim et al., 2012; Siengthai & Udomphol, 2016).

Highly administrative work was the hallmark of organisations of the past where many tasks required extensive effort to be completed. This was largely due to technology and the work methods that were time consuming and thus did not promote efficiency and value adding. With new technology, today's organisations have the ability, unlike any other time in history, to improve not only what is done but the way in which it is done. This allows for ever-greater numbers of tasks to become automated and completed without the need for employees and therefore allowing them to focus on other aspects of their work (Jones, 2016; Kassim et al., 2012).

An overall reduction in administrative-related work for systems users and the time taken to complete this work makes a positive contribution to organisational effectiveness. This is achieved as employees are free to pursue other aspects of their jobs that may add greater value to the

organisation (Ankrah & Sokro, 2012; Siengthai & Udomphol, 2016). The result of the additional time and effort is that employees can focus on more value-adding aspects of their jobs (Anitha & Aruna, 2013)

### 2.3.2 Repository of information and compliance

The ability to centrally store information is often overlooked in our modern and technologically advanced world of work, but remains a critical function of any HRIS (Ankrah & Sokro, 2012; Anitha & Aruna, 2013; Jain, 2014; Jawahar & Harindran, 2013; Jones, 2016; Qaisar et al., 2018; Siengthai & Udomphol, 2016). Today's focus when it comes to systems is often centred on their functionality and capabilities and not basic design elements such as storing information. One of the greatest strengths, however, that many systems still possess is that they offer a central location to store information and take what many organisations store in Excel and transfer it to a more robust and powerful environment (Jawahar & Harindran, 2013).

Storing information in a system ensures that it does not get lost, or change, or become corrupted, it can be retrieved quickly, and it can be secured with differing levels of access, depending on the users' requirements. In their study on HRISs and their impact on organisational performance Qaisar et al. (2018) determined that an HRIS provides a range of benefits, not least of all is its ability to assist with compliance requirements and the storage of information. Jones' (2016) study on HRISs advised that compliance in terms of the way data is reported from the system was a central reason for the implementation of an HRIS in an organisation.

In addition to providing the functionality of centralising information, an HRIS also makes it possible to enhance searching capabilities and categorisation of information (Jain, 2014). An example of this categorisation functionality would be the capturing of training conducted by the organisation into different types, as the user could code and load the information in several ways, such as by type, per course, per provider and so forth, depending on the data requirements of the organisation and the reports it wants to generate.

### 2.3.3 Reporting and analysis

An advantage of most HRISs on offer today is their ability to take information that has been loaded into the system's database and provide mechanisms to, view, extract and analyse it (Anitha & Aruna,

2013; Du Plessis & De Wet Fourie, 2016; Jones, 2016; Qaisar et al., 2018). This functionality provides HRIS users with a powerful tool capable of performing tasks that would normally have taken a considerable amount of time and concentration on the part of employees. The result is an overall reduction in the time and administration required to complete the task and an enhancement of the quality of information that is produced.

Reports that can be generated from HRISs range in size, complexity and layout from simple list reports containing rows of data in a chosen format such as pdf, Excel or Word, to more sophisticated reports and graphics that display data in a visually informative manner (Du Plessis & De Wet Fourie, 2016). The difference in reporting capabilities is determined by the functionality of the chosen HRIS and the power behind its reporting mechanisms. The more powerful and equipped the HRIS is, the more informative the information that can be produced.

From an analysis perspective, a larger system, such as an ERP, can provide users with dashboards and other data analytics capabilities that combine big data from various areas of an organisation (Siengthai & Udomphol, 2016). These tools then allow users to create and display visual correlations between different sets of information allowing for the identification of trends and the provision of information for decision-making purposes.

#### 2.3.4 Other important considerations for HRISs

Apart from the benefits derived from HRISs discussed above, an issue plaguing the field of HRIS is the lack of use or underutilisation of these systems for their intended purpose (Udekwe & de la Harpe, 2017). In his study, Berger (2014) identified an HRIS as a linchpin for most organisations with the capability to bring together several different functions. Hence if a system is not utilised the way it was intended, collaborative benefits cannot be realised.

The size of an organisation, as discussed previously, has been identified as a contributing factor to how an HRIS is used, what aspects of the system are purchased and implemented, and the value the system can add to the organisation (Ankrah & Sokro, 2012; Ball, 2001; Udekwe & De la Harpe, 2017). The larger an organisation, the more likely it is to have an HRIS to assist in the management of employee information and how to use it.

## 2.4 Existing models for HRISs

As the use of HRISs has expanded to organisations of all sizes across the globe, so too have models been developed on how these systems function and how they can be used. This section focuses on some of the existing models identified in the literature that provide tools and information on not only the implementation of HRISs but also whether they will be successfully used. Some of the models that will be discussed are the Technology Acceptance Model (TAM), the HRIS Adoption Model, the UTAUT model, the Conceptual Model of HRIS Adoption, the Unique Model, and the Research Model: Conceptualising the strategic role of HRISs.

### 2.4.1 TAM

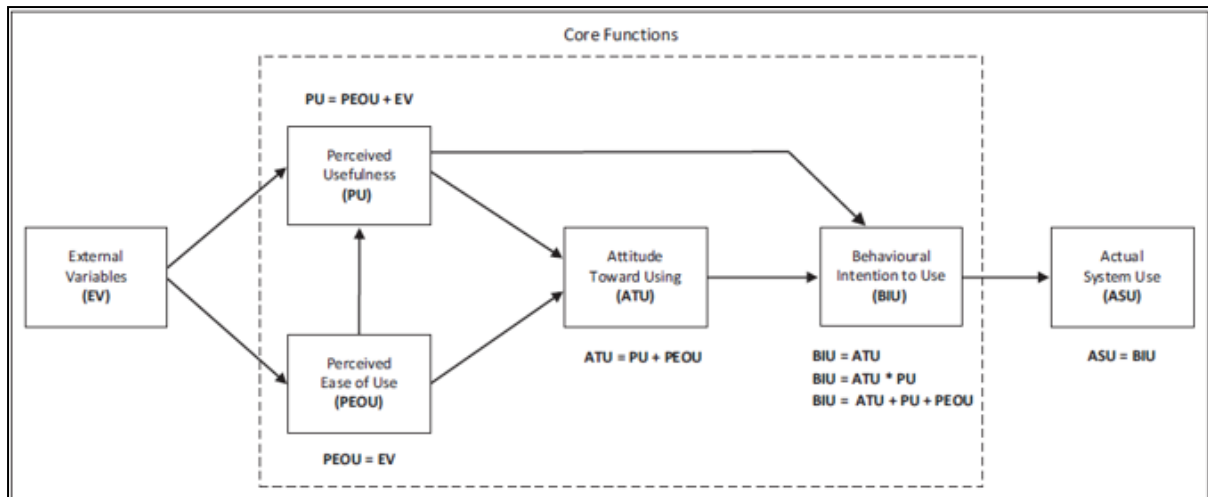
The first model to be discussed, as identified in a literature review, is the Technology Acceptance Model (TAM) (Erasmus et al., 2015). This model deals specifically with the elements influencing whether the information systems implemented are accepted within an organisation, and covers the following six primary elements: (1) external variables; (2) perceived ease of use; (3) perceived usefulness; (4) attitude towards use; (5) behavioural intention to use; and (6) actual system use.

The TAM is the most widely used model in understanding why certain information systems are implemented successfully and why others are not, and provides significant information to tailor-make projects to ensure greater success in system implementation and its use (Erasmus et al., 2015; Jawahar & Harindran, 2013; 2016). The model is depicted in figure 2.1.

#### **Figure 2.1**

*Technology Acceptance Model*





*Note.* Technology Acceptance Model. From User acceptance of computer technology: A comparison of two theoretical models, by Davis et al., 1989, *Management Sciences*, 35, pp. 982–1003.

(<http://dx.doi.org/10.1287/mnsc.35.8.982>)

The model has two significant elements, namely perceived ease of use and perceived usefulness. Both elements relate directly to the user’s perception of the information system and whether it is simple and noncomplex and will add value to the job through its use.

Perceived ease of use, however, is the principal element in the model, as it drives many of the other subsequent elements.

The external variables element relates to those outside factors that may have an influence on the core functions of the model. This influence, however, is only from an inputs’ perspective with the core functions mediating the influence of the external variables (Erasmus et al., 2015). In their study, Erasmus et al. verified that external variables have an indirect influence on perceived ease of use and perceived usefulness and can be divided into two distinct sections. The first is individual differences between users, and the second, systemic characteristics. It was determined that both categories can be altered and controlled to enhance the mechanics of the TAM (Erasmus et al., 2015).

#### 2.4.1.1 Strengths

The model is the most widely adopted in the review of the implementation and use of systems within organisations. Based on the analysis of the model, it is deemed to have the following several strengths that make it suitable for this purpose:

- *Versatility.* The model has been used in several industries and can study various system types. Erasmus et al.'s (2015) study validated the model in a South African environment and it can therefore be used in further studies to assist with system implementation projects.
- *Ease of comprehension.* Owing to its design, the model is easy to comprehend. It contains variables and constructs that are relevant to systems, and provides a blueprint for any project relating to the implementation and use of a system.
- *Incorporation of perceptual, behavioural and external variables.* Many models consider behavioural and perceptual elements in their constructors, but the strength of the TAM is that it considers the influence external variables such as individual differences between users may have on the result of system use in relation to the other constructs defined. This is a significant strength because it allows for users of the model to take external variables into account when they implement systemic projects.

#### 2.4.1.2 Weaknesses

Although the model has several strengths, as discussed above, it also has a number of weaknesses. These are as follows:

- The TAM only accounts for 40% of the variance in system use. While the model's contribution to the percentage of variance is statistically significant, there are several other factors that contribute more than half of the remaining variance. The result is that although the model provides useful information on understanding the use of implemented systems, it fails to consider several other factors that could affect the eventual outcome.
- The variables themselves are informative, but the factors affecting each are not dealt with in sufficient detail. The model comprises several significant variables that have been proven to influence whether users utilise the implemented system.
- The effect change management has on system implementation and use are not discussed and considered in the model's design. Several behavioural and perceptual variables are taken into account in the model, but none deal with the effect an effective change management strategy has on the implementation and use of a system.
- Regarding culture, climate and leadership, the effect of significant influences on project success and failure such as the organisation's culture, climate and leadership, is not adequately catered for in the model. The result is that the impact of these variables on the TAM and the ultimate use of an implemented system are unknown.

- Organisational size is not a variable considered in the model (Ankrah & Sokro, 2012; Ball, 2001; Udekwe & De la Harpe, 2017).

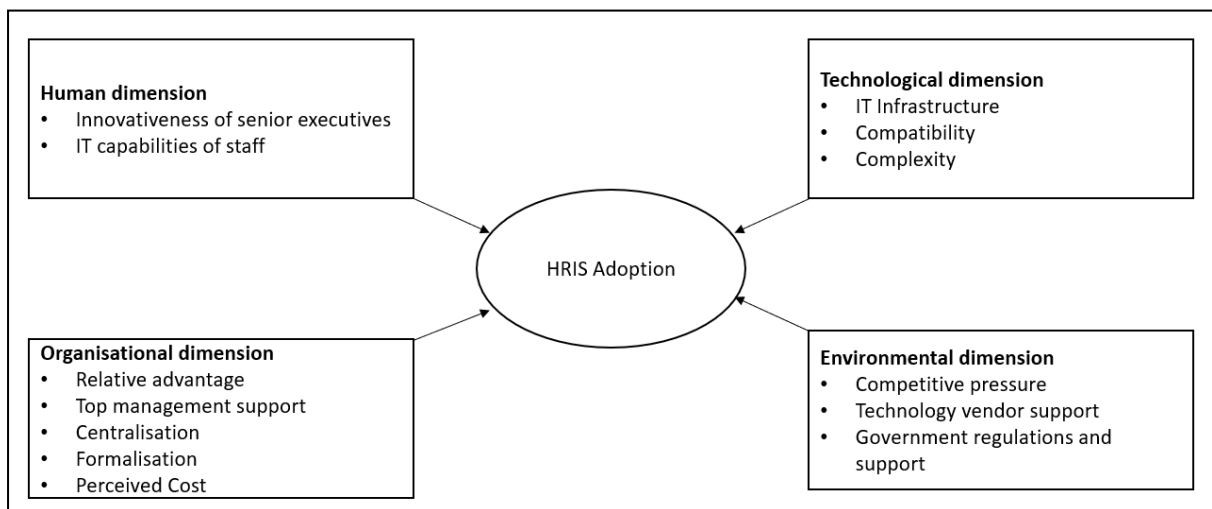
#### 2.4.2 HRIS Adoption Model

In their study on HRIS adoption in hospitals, Alam et al. (2016) reviewed the literature and identified four critical components that need to be considered before any HRIS implementation. The components were derived from a combination of the TOE and HOT-Fit Models on system adoption in organisations.

Alam et al.'s model, as represented in figure 2.2, includes the human, technological, organisational and the environmental dimensions. Under each dimension, the main factors that have an impact are listed:

**Figure 2.2**

*HRIS Adoption Model*



*Note.* HRIS Adoption Model. From Critical factors influencing the decision to adopt a human resource information system (HRIS) in hospitals by Alam et al., 2016, *Plos One*, 11, p. 8.

(<http://dx.doi:10.1371/journal.pone.0160366.g001>)

Based on the study, the principal dimensions identified as having an impact on HRIS adoption were the technological and organisational dimensions. The technological dimension deals with the IT infrastructure in the organisation and its perceived compatibility and complexity. The infrastructure and perceived compatibility were indicated as the two main factors in the dimension.

The organisational dimension was identified as the second most important dimension in the study. This dimension contains factors such as top management support and formalisation. The study identified top management support and perceived cost as the two main factors in the dimension.

The model that was developed provides a means for better managing and executing the implementation and usage of an HRIS in an organisation. One of the limitations in this regard, however, was that the model was only analysed in the public hospital environment in Bangladesh – hence the need for more research before it can be used in other industries and countries (Alam et al., 2016).

#### *2.4.2.1 Strengths*

In an analysis and review of the model, the following areas were identified as strengths:

- It has a holistic use of variables that cover the entire organisation and the different functions that may influence systemic use and acceptance.
- Because of its effective balance between its various functional elements, it does not favour one specific set of variables over another.
- It makes use of two valid models to obtain specific factors that can be used when studying the use and acceptance of HRISs.

#### *2.4.2.2 Weaknesses*

A review of the model, indicated several weaknesses, as highlighted below.

- The model does not deal with the users' perception or experience, as with other models reviewed.
- Since the model was only validated in Bangladesh and only in one industry in the country, its generalisability is limited.
- It does not review the influence of change management, culture, climate and leadership on the acceptance of an HRIS.
- It does not take into account the differences between staff (age, experience, etc.) and how this may influence the adoption of an HRIS.
- Organisational size is not a variable considered in the model (Ankrah & Sokro, 2012).

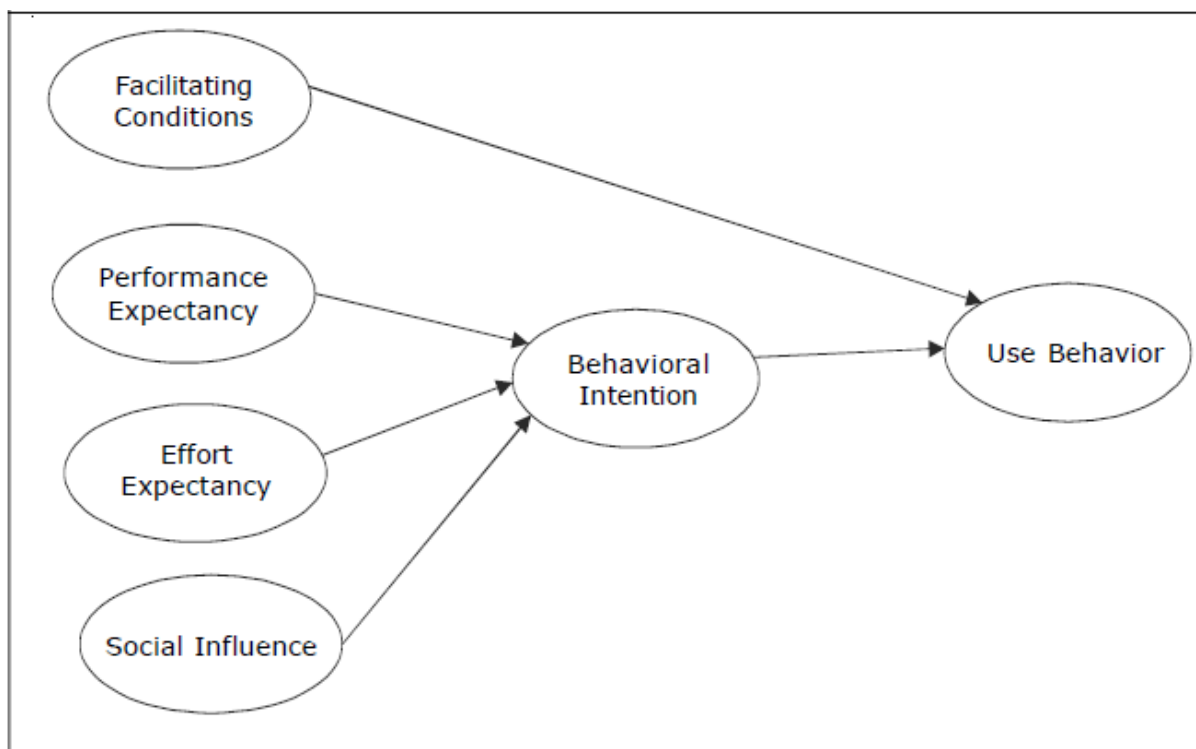
### 2.4.3 UTAUT

The Unified Theory of Acceptance and Use of Technology Model (UTAUT) was developed utilising a combination of eight different models analysed, based on the work of Venkatesh et al. (2003) to formulate a model that had a higher level of predictive validity than the other models that had been studied (Jawahar & Harindran, 2013; 2016). Models used in the formulation of the UTAUT included but were not limited to the following: the Innovation Diffusion Theory (IDT), the Technology Acceptance Model (TAM) and a combination of combined the Technology Acceptance Model and Theory of Planned Behavior (C-TAM-TPB).

The constructs of the UTAUT model and their influences are depicted in figure 2.3.

**Figure 2.3**

*The Unified Theory of Acceptance and Use of Technology (UTAUT) Model*



*Note.* UTAUT Model. From User acceptance of information technology: Toward a unified view by Venkatesh et al., 2003, *MIS Quarterly*, 27(3), pp. 425-478.

As with the other models previously discussed, a central element in the UTAUT indicated in figure 2.3 is the experience of the systems users. The three elements of performance expectancy, effort expectancy and social influence in the model combine to influence a user's behavioural intention to

utilise an HRIS (Jawahar & Harindran, 2013). The two primary aspects of the model are performance expectancy and effort expectancy, as they contribute directly to the user's behavioural intention, resulting in whether or not the HRIS is used (Jawahar & Harindran, 2016).

According to the study conducted by Jawahar and Harindran (2016), the model proved to be effective in predicting 70% of the variance in the user's intention of utilising an HRIS but proved to be inconsistent when applied in different situations. The authors recommended that the model be tested in environments where it can be used in conjunction with more sophisticated HRISs and organisations to enhance its predictive validity across various environments.

The UTAUT reviewed and incorporated several elements from well-established and utilised models of HRIS use. The result, as discussed, was a model with several factors relating directly to the way in which users experience the system they are using, and providing a vital tool for any practitioner intending to implement an HRIS in an organisation.

#### *2.4.3.1 Strengths*

Based on the analysis and review of the model, the following strengths were identified:

- It incorporates several variables that impact system acceptance and use and that cover a significant range of functional areas within an organisation.
- It draws data from several existing and valid models on HRIS use and acceptance.
- It accounts for a significantly greater percentage of variance than other models, at 70%.

#### *2.4.3.2 Weaknesses*

An analysis and review of the model revealed the following weaknesses:

- It does not consider the effect of change management, culture, climate and leadership on the use of an HRIS.
- It does not deal with elements pertaining to the individual users such as their age, experience, education and so forth, and how these influence HRIS use.
- The results obtained for the model in the study reviewed, proved it to be less accurate across different environments, and this therefore limits its generalisability (Jawahar & Harindran, 2016).

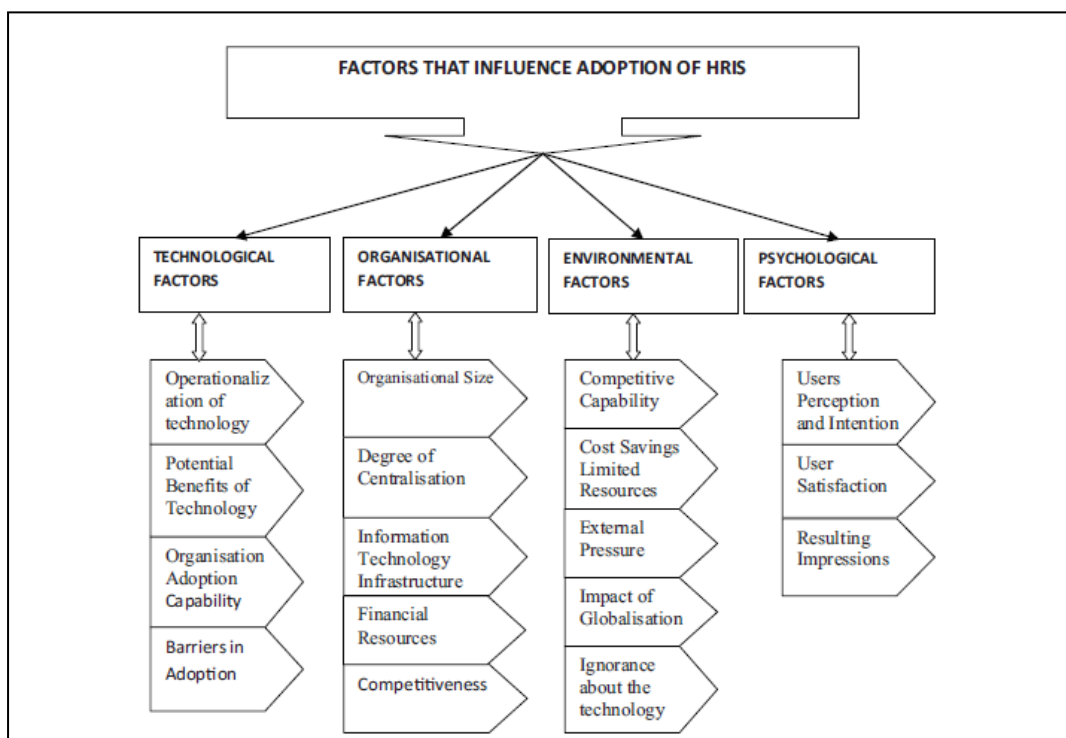
- The model needs to be validated using more complex HRIS and organisational environments in order to increase its generalisability.
- Organisational size is not a variable considered in the model (Ankrah & Sokro, 2012).

#### 2.4.4 Conceptual Model of HRIS Adoption

In their study of HRIS use and implementation, Anitha and Aruna (2013) reviewed several existing models and conducted an extensive literature review to determine the main factors that contribute to the system’s adoption. The result of the review was the model depicted in figure 2.4 for HRIS adoption that focused on four main factors, namely technological, environmental, organisational and psychological:

**Figure 2.4**

*Conceptual Model of HRIS Adoption*



*Note.* Conceptual Model of HRIS Adoption. From Adoption of human resource information systems in organisations by Anitha and Aruna, 2013, *SDMIMD Journal of Management*, 4(2), p. 9.

#### *2.4.4.1 Technological*

Anitha and Aruna (2013) pinpointed the technology factor as one of the most critical to the adoption of HRIS. The factor consists of two main components, namely the realisation of the benefits of the system and the organisation's capabilities in implementing the system.

Benefit realisation relates primarily to the advantages and uses of the newly implemented system to the managers and other systems users. The practical or operationalisation element deals with the organisation's capacity to implement the new system.

#### *2.4.4.2 Environmental*

The environmental factor focuses on the external influences of HRIS adoption, such as the pressure of competitors or the industry in which the organisation operates. These external pressures exert a significant amount of influence on an organisation to adopt an HRIS in order to increase efficiencies, gain a competitive advantage and keep abreast of the latest technological developments (Anitha & Aruna, 2013).

#### *2.4.4.3 Organisational*

As indicated in the previously discussed studies, the size of an organisation also influences the adoption of an HRIS. For larger organisations the likelihood of already developed IT applications and the capacity to deal with the costs of implementing an HRIS are higher and therefore provide them with an advantage over SMEs in which these resources are not in place (Anitha & Aruna, 2013).

#### *2.4.4.4 Psychological*

The last factor in the model that was developed is the psychological factor that focuses specifically on the perceptions of the systems users. This factor is similar to those previously discussed, namely the experience of users in other models, and it has a significant influence on the ultimate success or failure of an HRIS's implementation (Anitha & Aruna, 2013).



Another focus of the psychological factor is the issues experienced by system users with a lack of technical expertise in and/or background on HRIS. Many of these users fear that this system will replace their jobs and are therefore afraid to make use of it. Dealing with these issues and ensuring that users are comfortable with the system being implemented is therefore critical in the adoption of any HRIS (Anitha & Aruna, 2013).

#### *2.4.4.5 Strengths*

Based on a review and analysis of the model, the following areas were identified as its strengths:

- It has a holistic use of variables that cover the entire organisation and the different functions that may influence systemic use and acceptance.
- It has a sound balance between the various functional elements in it.
- It makes use of two valid models to obtain specific factors that can be used when studying the use and acceptance of HRIS.

#### *2.4.4.6 Weaknesses*

A review of the model revealed the following weaknesses:

- The model fails to include the users' perception or experiences, as with the other models reviewed.
- The model was only validated in Bangladesh and in only one industry in the country. Its applicability in other countries and working environments is therefore limited.
- It does not review the influence of change management on the acceptance of HRIS.
- It does not incorporate other influences on organisations such as leadership, culture and climate.
- It does not take into account the differences between staff (age, years of service, etc.).
- Organisational size is not a variable considered in the model (Ankrah & Sokro, 2012).

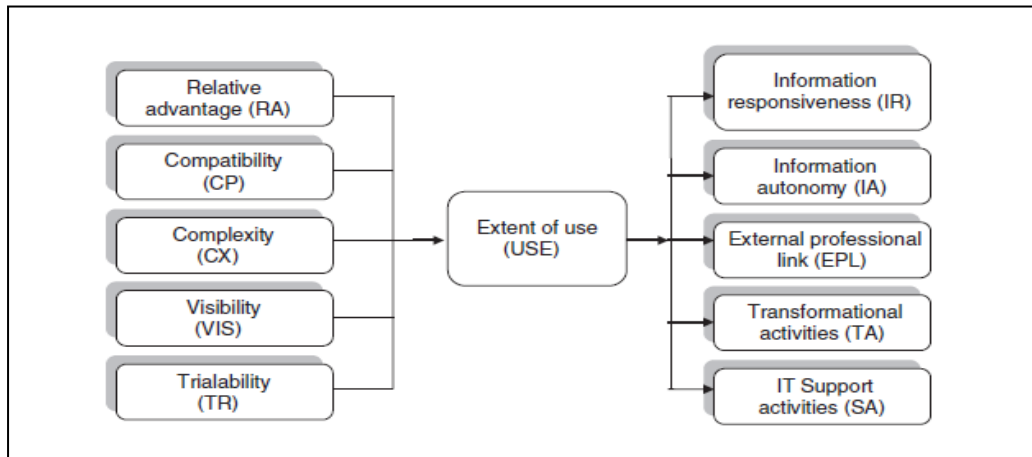
### *2.4.5 Unique Model 1*

The model formulated by Kassim et al. (2012) focused specifically on the Diffusion of Information Model developed by Rogers (1983), the IT Framework Model developed by Remenyi et al. (1991)

and research conducted by Zuboff (1988). The result was a model that deals with the following characteristics: Relative advantage, compatibility, complexity, visibility and trialability, as depicted in figure 2.5.

**Figure 2.5**

*Unique Model for HRIS Use*



*Note.* Unique Model for HRIS Use. From Antecedents and outcomes of human resource information system (HRIS) use by Kassim et al., 2012, *International Journal of Productivity and Performance Management*, 61(6), p. 608.

#### 2.4.5.1 Relative advantage

According to Kassim et al. (2012) and Rogers (1983), relative advantage focuses on the benefits perceived by the user of brought by the systems implementation, which is significantly like the perceived usefulness factor of the TAM. This construct of the model influences the final adoption of the system by users, based on the perception that it will make the work easier.

#### 2.4.5.2 Compatibility

The compatibility construct focuses on whether the system being implemented is in line with the organisation's values, culture and the experiences of the potential system users. The more aligned the system that is being implemented is with these various elements, the more likely it is to be used (Kassim et al., 2012; Rogers, 1983).

#### *2.4.5.3 Complexity*

According to Kassim et al. (2012), complexity relates to the difficulty of using the system and aligns closely with the perceived ease of use factor in the TAM. The less complex a system is perceived by the user base, the more likely it is to be used.

#### *2.4.5.4 Visibility*

The construct of visibility focuses on the transparency of a new system being implemented with the likelihood of it being used in terms of a relationship with the perceived visibility of results of the implementation (Kassim et al., 2012).

#### *2.4.5.5 Trialability*

The construct, trialability, focuses on how frequently users are able to try a concept. Hence systems that can be tested repeatedly and frequently with transparency in their workings and functionality have a greater likelihood of being used (Kassim et al., 2012).

#### *2.4.5.6 Information responsiveness*

With the implementation of an HRIS, the users' ability to review information and provide meaningful feedback quickly is enhanced (Kassim et al., 2012). The result is that professionals in the HR function and elsewhere in the organisation gain faster access to information and can therefore make better informed decisions.

#### *2.4.5.7 Information autonomy*

Information autonomy focuses on users' ability to gain access to information that would previously have required manual intervention (Kassim et al., 2012). With the implementation of an HRIS, these users then can access the system and review data stored without the need to manipulate information manually or make use of external data sources such as Excel sheets.

#### *2.4.5.8 External professional relationship*

The external professional relationship construct relates to users' ability to access other potential sources of information using an HRIS, thus enhancing the quality of the information gathered and decision making. The construct also focuses on the ability to better deal with change because of the enhanced information that can be acquired and the potential of tapping into a professional network generated, using the implemented HRIS and web-related functionality (Kassim et al., 2012).

#### *2.4.5.9 Transformational activities*

One of the most critical benefits of an implemented and utilised HRIS is the construct of transformational activities that focuses on the ability of system users to allocate more of their time to more value-adding tasks in the organisation. Users can therefore reduce the amount of administrative work required through the functionality provided by an HRIS and reallocate their time (Kassim et al., 2012).

#### *2.4.5.10 IT support activities*

Since an HRIS is fundamentally an IT-related system, its implementation and use increase users' IT support activities. These activities include the provision of system support, maintenance and resolution of issues identified (Kassim et al., 2012).

The model developed above differs from those already discussed in that it focuses not only on the elements that influence the use of an HRIS, but also on the benefits stemming from successful HRIS implementation and adoption by the user base. Many of the benefits, as indicated above, relate to increases in the speed of task completion, access to information and automation of traditional administrative tasks.

#### *2.4.5.11 Strengths*

Based on the review and analysis of the model, the following strengths were identified:

- It incorporates several constructs that cover a wide range of influences on systemic use and acceptance.
- Several of the core constructs focus on the perception of the users of the system.
- Unlike other models reviewed, it relates to constructs that have to do with the benefits of using the implemented HRIS and not only what influences whether or not the HRIS is used and accepted.
- Unlike the other models reviewed, its main focus is on compatibility of the HRIS and whether it matches the organisation in which it is implemented.

#### 2.4.5.12 Weaknesses

The review and analysis of the model identified the following weaknesses:

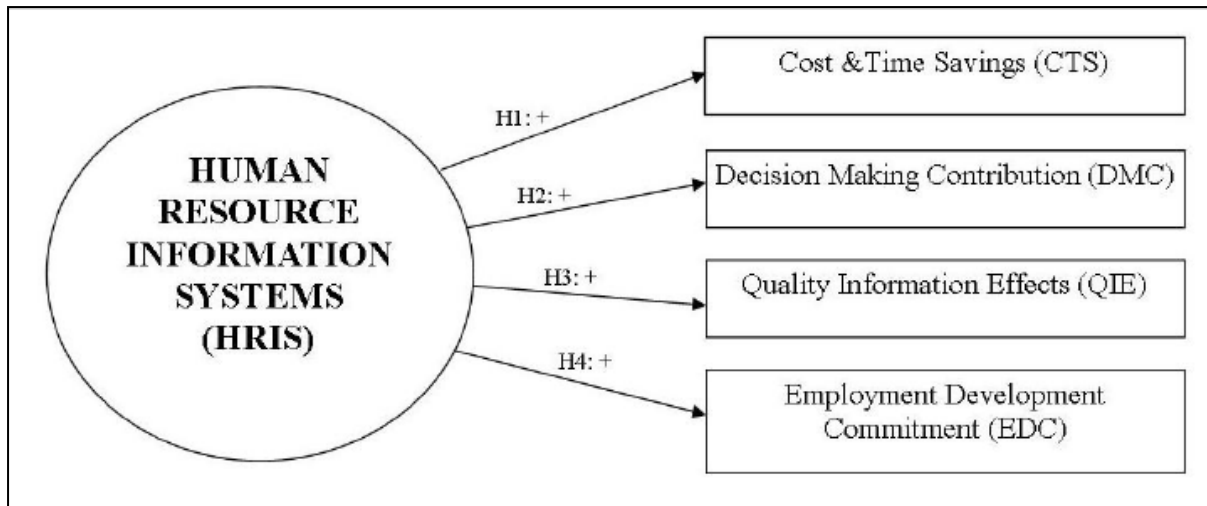
- It does not deal with change management, culture and climate and their possible effect on the implementation and use of an HRIS.
- It does not consider the differences between users as a potential influence on whether or not the HRIS is used.
- The model does not deal with the effect that leadership and top management support have on the HRIS's use.
- Organisational size is not a variable considered in the model (Ankrah & Sokro, 2012).

#### 2.4.6 Research model: Conceptualising the strategic role of HRIS

The model developed by Ankrah and Sokro (2012) relates to the benefits derived from the use of an HRIS in an organisation. The model indicated in figure 2.6 contains the following four constructs: (1) cost and time savings; (2) decision-making contributions; (3) quality information effects; and (4) employment development commitment.

#### Figure 2.6

*Model for Strategic Use of an HRIS*



*Note.* Model for Strategic Use of an HRIS. From Human resource information systems as a strategic tool in human resource management by Ankrah and Sokro, 2012, *Problems of Management in the 21<sup>st</sup> Century*, 5, p. 10.

The results of the study conducted by Ankrah and Sokro (2012) supported the hypothesis that increased use of an HRIS within an organisation leads to the benefits identified in their HRIS use model. The conclusions drawn, however, indicated a greater need for organisations to better manage and plan the implementation and sustained use of an HRIS system.

#### 2.4.6.1 Strengths

Based on a review and analysis of the model, the following strengths were identified:

- This model, unlike the other models reviewed in the literature, focuses on the benefits that can be derived from the implementation and use of an HRIS and does not only look at what influences use and acceptance.
- The benefit categories highlighted provide an excellent summary of the areas that can be enhanced by the implementation and use of an HRIS.

#### 2.4.6.2 Weaknesses

Based on a review and analysis of the model, the following weaknesses were identified:

- The effect of variables such as change management, leadership, culture and climate on an HRIS are not covered in the model.
- Demographic variables of the users such as age, education, years of service and so forth are not included in the model.
- Variables that influence whether or not the system is used do not appear in the model and it therefore only provides for the output portion of the review of HRIS.
- The model does not consider organisational size (Ankrah & Sokro, 2012).

#### 2.4.7 Overview and summary of the existing models on HRIS

Several models were identified and discussed in the literature review conducted on HRISs. Each model has been designed for one main purpose namely, to measure the use of the HRISs implemented in organisations. Of the models discussed, the UTAUT is deemed the most effective and valid (Jawahar & Harindran, 2016). The reasoning for this is as follows: (1) it reviews and combines information from several existing and well-established models on HRISs; (2) it is a more recent model; (3) it distils the key elements from each of the models reviewed to formulate a conclusive list of constructs; (4) it explains up to 70% of the variance in the system usage when compared to the 40% of other existing models; and (5) the model considers factors such as the users' age, gender, and experience.

Although the UTAUT was identified as the best of those reviewed, in the opinion of the researcher, it still has several limitations. These are as follows: (1) it focuses exclusively on the implementation of and intention to use an HRIS and not on the results from the use of a system (i.e. what it assists within the organisation); (2) it provides little guidance to non-systemic users on the model's functioning and use; (3) the effect that variables such as change management, leadership, culture, and climate have on an HRIS is not covered in the model; and (4) organisational size is not a variable considered in the model (Ankrah & Sokro, 2012).

### 2.5 Trends and new developments

While there are several existing models and dozens of studies on the HRIS, its implementation, benefits and use, reports like that published by Deloitte (2018) and other organisations on the trends in human capital highlight the importance of technology to the function. Two critical areas

are highlighted in Deloitte's (2018) report that were of particular significance for technology. Two of them will be discussed in more detail below in relation to the current study, namely AI, robotics, and automation: Put humans in the loop, and the hyper-connected workplace: Will productivity reign?

### 2.5.1 AI, robotics, and automation: Put humans in the loop

In line with the benefits discussed earlier in the chapter on HRIS, increasingly more organisations are beginning to focus on automating manually intensive work, utilising technology to enhance the way work is completed and using the large amounts of data available to HR functions to enhance decision-making capabilities. For many organisations, implementing an HRIS that has automation, workflow, analytics and AI capabilities is becoming increasingly important to realise the benefits of the new technology available to organisations (Deloitte, 2018).

With the ever-increasing focus on technology and making things easier, one could assume that the human element of organisations will be reduced or removed. The fact of the matter is that according to Deloitte's 2018 human capital trend report, the exact opposite is the case. Many of the organisations embarking on the automation, AI, robotics journey also reported a significant focus on their employees and ensuring they attract and retain the right people (Deloitte, 2018).

To achieve these aims, individuals with critical skills, such as complex problem solving, social skills and cognitive abilities are being sought after by organisations. The goal is to attract and retain the right workforce that can focus on implementing new technology, enhancing existing business processes and changing the way the organisation currently works (Deloitte, 2018).

These trends are relevant to the study as organisations increasingly focus on using technology and therefore a model on extracting information from various systems and tools to provide an indication of organisational success could assist practitioners.

### 2.5.2 The hyper-connected workplace: Will productivity reign?

Because technology has become more embedded in every facet of people's lives, organisations have become increasingly focused on the communication tools utilised by their workforce and the way in which information is disseminated. The major findings from the Deloitte (2018) trends report were that many South African organisations viewed the hyper-connected workforce as a key area of focus.



For organisations to realise a hyper-connected workforce, they are increasingly seeking new and innovative tools that will allow them to communicate with their workforce and disperse required information, feedback, recognition and updates (Deloitte, 2018). With a hyper-connected workforce, staff are constantly aware of what is going on in their organisation and receive a constant stream of feedback to realign or continue with their performance.

This section is relevant to the study as more systems and tools are connected the importance of accessing and making use of the information that they store for an organisation becomes more critical. The model the study will seek to develop will assist practitioners in utilising the information in these systems and tools.

## 2.6 Measures of HRIS

Based on the literature review and analysis conducted on HRISs in this chapter, a list was compiled to provide an indication of the effective use of an HRIS. The proposed list of measures is provided in table 2.1

**Table 2.1**

*Possible Measures of an HRIS*

	Measures	Source
HRIS	Does the organisation have an HRIS?	Berger (2014)
	Usage of the HRIS	Berger (2014)
	Reduction in administration levels with an HRIS	(Ankrah & Sokro, 2012; Siengthai & Udomphol, 2016).
	Storing of information on HRIS	Qaisar et al. (2018)
	Reporting and analysis conducted using an HRIS	(Anitha & Aruna, 2013; Du Plessis & De Wet Fourie, 2016; Jones, 2016; Qaisar et al., 2018)

Based on the table and literature review conducted, the proposed measures focus mainly on reducing administration and promoting greater access to and use of information.

## 2.7 Reflections and link to study objectives

Based on the overview and analysis provided in this chapter on HRIS and the models identified from the literature, the benefits of using an HRIS for an organisation have been identified and validated. Additionally, it was determined that no current model was identified from the literature that meets the requirements of this study and its objectives of designing a model for the use of HRIS data to assess organisational success factors. It has therefore been determined that a new model will need to be developed to meet the objectives of the study. The chapter provides a positive contribution to the study and its objectives of identifying factors and their measures that could be used a means to assess organisational success by conceptualising the construct of HRIS and its key components from a theoretical perspective.

## 2.8 Chapter summary

In this chapter, the history of HRISs and how they evolved were explained. The different types of HRISs and what they can do were discussed. The functions and benefits of HRIS were explained. Models of HRISs that currently exist and were identified in the literature were reviewed and an analysis conducted of on their strengths and weaknesses. Future trends and developments in technology and their potential influence on functions such as human capital were highlighted. Reflections were also made of the chapter and its links with the objectives of the study. In conclusion, a list of measures for an HRIS in an organisation were developed, based on the literature review.

In chapter 3, the factors identified in the literature that contribute to organisational success are discussed. A breakdown of each factor, its definition and main elements is also explored.

## Chapter 3: Organisational Success Factors

### 3.1 Introduction

Modern organisations find themselves in a highly competitive, rapidly changing and interconnected world, and for most, measuring their performance has become more than only a review of existing financial measures. Well-known authors such as Kaplan and Norton (1992), Ndlovu (2010), Oosthuizen, Fontannaz (2007) and Drucker (1954) have researched and provided guidance on how organisations can measure their performance against several elements that provide a more holistic picture than the traditional financial measures used. Coupled with newer models, such as the Baldrige Excellence Framework of Badri et al. (2006), these organisational success factors (OSFs) are the focus of this chapter in which each factor, identified on the basis of a review of the literature, is discussed and reviewed.

Organisational success or performance factors are the goal of every organisation and may take the form of making profits or fulfilling a specified mandate such as the provision of free textbooks to learners. The result is that organisations all over the world are measured on their performance using sets of measures and metrics. For many organisations, the metrics and measures that are used are financial in nature, whereas for others the focus is largely on nonfinancial measures and metrics.

The overall aim of the chapter is to define organisational performance and provide an understanding of the relevant nonfinancial measures that can be used to measure the performance of organisations based on information extracted from various HRISs.

### 3.2 Definition of organisational success

For the current study, it was deemed critical that a consistent definition of organisational performance and success be used to ensure alignment between the success factors identified in the literature and their use in a model predicting organisational performance based on measures supported by information extracted from an HRIS. To meet this objective, the following list of definitions, as identified in the literature, is provided, as well as the overall definition that would be used in the study:

- Organisational success can be defined at a high level as a set of both financial and nonfinancial indicators capable of assessing the degree to which organisational goals and objectives have been accomplished (Kaplan & Norton, 1992).
- Business performance is considered as a multidimensional concept illustrating how well an organisation fulfils its financial and market-oriented goals (Qrunfleh & Tarafdar, 2013).
- Organisational performance at a high level refers to an organisation's ability to attain its goals by using resources efficiently and effectively (Daft, 2000).

The above definitions all adopt a different perspective when it comes to organisational performance, but for the purpose of this study, the definition that was used was provided by Daft (2000). This definition was deemed to provide a satisfactory description of the different performance elements for organisations and that the concept of performance is multidimensional and therefore cannot be adequately explained by one set of criteria.

### 3.3 Key organisational success factors

Kaplan and Norton (1992), Haddadi (2016) and Singh et al. (2016) identified four areas they regarded as critical for organisations to achieve success and perform. These areas are internal business processes, financial, customer and learning and growth. For the purposes of this study and this chapter, two of the four areas, namely internal business processes and learning and growth, as identified in the balanced scorecard, are discussed. These areas were further discussed in the Baldrige Framework for Excellence study by Badri et al. (2006), where they, along with leadership, were identified as key criteria for performance excellence. The list of OSFs identified in the literature were leadership, organisational culture, job satisfaction and organisational commitment, organisational learning and knowledge management, and internal business processes.

In this this chapter, only job satisfaction and organisational commitment, organisational learning and knowledge management, and internal business processes are discussed and analysed in detail.

The constructs of leadership and organisational cultural are discussed and reviewed in detail in standalone chapters 4 and 5, and a list of possible measures of these constructs is also be provided. This is because of their importance to organisational performance as identified in the literature.

### 3.3.1 Job satisfaction and organisational commitment

The construct of job satisfaction (JS) is discussed in detail in chapters 4 and 5 because it relates to and is influenced by leadership and organisational culture. The aim of this section is therefore to seek to clarify the construct of JS, provide a definition for its use in this study, highlight its relationship with organisational performance and explain the current models and tools used for measurement.

To ensure that the same understanding of JS is conveyed in this section of the study, several definitions are listed below, with an overall definition, as adopted in this study:

- JS is an affective reaction to a job that results from the incumbent's comparison of actual outcomes with those that are desired, expected and deserved (Castaneda & Scanlan, 2014, p. 130).
- JS is described as the degree to which the individual positively evaluates his or her job experiences (Yang, 2016).
- "A positive (or negative) evaluative judgment one makes about one's job or job situation" (Weiss, 2002, p. 175)
- A pleasurable or positive emotional state resulting from the appraisal of one's job and job experiences and as a function of the perceived relationship between what one wants from one's job and what one perceives it is offering (Locke, 1976).

When reviewing the above definitions, the key elements that can be extracted are perception, a comparison between the actual and desired situations and the emotional response to such a comparison. Based on the definitions listed, the one that was deemed best suited to the study was that of Locke (1976). This is due to its inclusion of perception as a critical element, as it relates to what is being offered and what someone wants that is unique from the other definitions.

JS influences can be divided into two distinct elements, namely intrinsic and extrinsic (Buitendach & De Witte, 2005; Lawler, 1976). Extrinsic influences, such as the job itself, are beyond employees' control, whereas intrinsic influences are within their control and include factors such as rewards for performance.

A review of the literature indicated that JS and organisational commitment (OC) often appear to be directly correlated (Khan & Wan Ismail, 2017; Lin et al., 2018; Malik et al., 2017; Trmal et al., 2015). These two components of employee behaviour within an organisation are becoming increasingly important. The primary reason for this is that organisations seek to provide their workforce with an

enjoyable working environment and thereby reap the rewards associated with enhancing these components.

The following definitions of OC were identified in the literature:

- OC can be defined as “the relationship that exists between an individual and an organisation, attachment, identification with the organisation, the need to remain and the will to work hard to meet the organisational goals” (Ndlovu et al., 2018, p. 2)
- OC encompasses a strong belief in and acceptance of the organisational goals and values; (2) a willingness to exert a considerable amount of effort on behalf of the organisation; and (3) a desire to remain within the organisation (Mowday et al., 1979; Poter et al., 1974).
- Khan et al. (2014) stated that OC is a link, association or bond of the employee with the institution, a psychosomatic state that distinguishes the individual association with the proposition for the decision to continue the attachment to the organisation.
- According to Lamba and Choudhary (2013), OC is the individual psychological attachment to the organisation, while commitment represents something beyond loyalty to an organisation and involves an active relationship with the organisation such that individuals are willing to dedicate their talents to the organisation in order to contribute to its well-being.

Of the above definitions, the one deemed to be best suited to the study was that proposed by Ndlovu et al. (2018). This definition was chosen because of the specific use of the words “relationship” and “identification” with the organisation. Based on the literature review, these were pinpointed as the two key elements in efforts to understand OC.

### *3.3.1.1 Job satisfaction and organisational commitment and their relationships with other constructs*

This section details the relationships between JS and other constructs as identified in the literature.

#### *a) Organisational learning*

One of the first relationships between either JS or OC and other constructs identified in the literature was with organisational learning (OL). In their study on OL measurement and the effect on firm innovation, Tohidi et al. (2012) identified a significant relationship between JS and OL. Chiva and Alegre (2009) also found a positive relationship between OL and JS. From the studies there appears

to be a correlation between JS and the elements of OL – hence a positive significant correlation between the two constructs.

#### b) Transformational leadership

The second correlation with another construct was between JS, OC and leadership. In their study on the impact of transformational leadership on OL, Khan and Wan Ismail (2017) highlighted the correlation between transformational leadership, JS and staff turnover. The findings indicated that when transformational leadership was implemented in an organisation, one of the effects was an increase in job satisfaction and a decline in staff turnover (Khan & Wan Ismail, 2017).

JS is a sought-after goal for many employers and employees today, and based on research focusing on transformational leadership and a high-performing workforce, transformational leadership has a positive influence on employees' job satisfaction (Trmal et al., 2015). The importance of leadership, as a key determinant of job satisfaction, has been highlighted in several studies, with each finding that leadership had a significant influence on job satisfaction (Khan & Wan Ismail, 2017; Koh et al., 2017; Lin et al., 2018; Malik et al., 2017; Mozumder, 2018; Schwendimann et al., 2016; Vanebo et al., 2015; Wei et al., 2018).

The studies conducted by Malik et al. (2017), Khan and Wan Ismail (2017) and Trmal et al. (2015) focused on the effect that transformational leadership had on organisational performance. As one of their key findings they determined that transformational leadership led to increased employee job satisfaction, which in turn, had an influence on the efficiency of employees in their jobs. A better performing workforce then led to increased organisational performance. Another area with a correlation to JS is OC and, according to Malik et al. (2017), both elements are affected by transformational leadership.

#### c) Organisational culture

Organisational culture was the next construct that JS and OC had a relationship with. This section provides a better understanding of the correlation between JS, OC and organisational culture, as identified in the literature review.

Both JS and OC are key constructs for any organisation and have been identified as being significantly influenced by organisational culture (El Din & El Ghetany, 2015; Malik et al., 2017; Trmal

et al., 2015; Yap Peng Lok et al., 2019). Hence an understanding of the influence of organisational culture has on these two constructs is essential so that their benefits to employees and the organisation can be realised.

JS is a construct that is influenced by several elements including leadership characteristics, employees' qualifications, organisational culture, job experience and gender (Amburgey, 2005). These suggested factors impact the level of JS that employees experience in their job and the positive effect that this then has on their performance.

According to Hu (2001), both transformational leadership and organisational culture have an influence on JS, which in turn, acts as a mediator between these constructs and organisational performance. The above study was also able to identify employees' personal characteristics and the match with the organisation's culture as having an influence on their job satisfaction and performance (Hu, 2001; Wallach, 1983). The findings indicated that the more aligned employees' characteristics are with the organisation's culture, the higher their job satisfaction is. Organisations that can project and communicate their values to prospective and current staff are likely to attract future employees and to enhance the JS of current staff.

In a review of the professional sector in Malaysia and the influence of organisational culture on JS and OC, a relationship was established between the constructs (Yap Peng Lok et al., 2019). Several types of organisational culture were reviewed to determine their effect on JS and OC. The overall findings indicated that a constructive culture, one characterised by collaboration, employee autonomy and a preference for quality over quantity, should be promoted to enhance JS and OC for professionals employed at various organisations in this sector.

The effect specific types of culture have on JS and OC, as identified by Yap Peng Lok et al. (2019), is further confirmed in El Din and El Ghetany's (2015) study. They conducted an analysis of the influence organisational culture has on JS and OC, and confirmed that a clan culture that is centred on collaboration, amongst the several culture types they reviewed, had the greatest influence on JS and OC. A national culture was also found to influence an organisation's culture and, in turn, thus affect JS and OC when it is related to the country's culture (El Din & El Ghetany, 2015).

Overall, as found in the above-mentioned studies, both JS and OC are influenced by organisational culture. It is therefore essential for any organisation to manage its culture and the norms it establishes to enhance JS and OC.



#### d) Organisational performance

In the past several years, JS has become increasingly important, along with a range of other constructs, to organisations seeking to manage those “softer” elements that affect their overall performance. This section deals with the influence job satisfaction has on individual and overall organisational performance by examining the relationship identified in the literature.

JS and its relationship with other constructs, such as leadership and culture, are discussed in detail in the chapters 4 and 5, which are devoted specifically to these constructs. This section therefore focuses primarily on the relationship identified between JS and organisational performance.

When reviewing the literature, the most established relationship between JS and performance is with individual performance, which in turn, has benefits for the organisation (Abdirahman et al., 2018; Abelha et al., 2018; Bakotić, 2016; Deery, 2005; Koh et al., 2017; Ok & Park, 2018; Riza et al., 2018; Schwendimann et al., 2016; Tasios & Giannouli, 2017). Studies such as those of Suan et al. (2015) and Trmal et al. (2015), which reviewed the impact of JS on an organisation, also highlighted JS as a significant contributor to overall organisational performance.

In their study on the impacts of several factors on JS, Koh et al. (2017) identified a significant positive correlation between JS and reduced turnover, reduced absenteeism, increased organisational commitment and enhanced job performance. These, in turn, indicated that greater progress is made in the achievement of organisational goals and objectives. The studies of Abdirahman et al. (2018), Abelha et al. (2018), Ok & Park (2018) and Schwendimann et al. (2016) supported these findings.

The relationship between JS and organisational performance identified in the literature was also established not only at individual level, but also at organisational level (Bakotić, 2016; Suan et al., 2015; Trmal et al., 2015). Several studies were conducted in which JS had a relationship with overall organisational goals and objectives because of the effect that it had on the workforce.

Riza et al. (2018) found that the age of employees and their tenure with an organisation had opposite effects on job satisfaction. The longer an employee remained at an organisation, the lower their job satisfaction was found to be, whereas as an employee aged, the higher their job satisfaction was. This was explained by the increased negative knowledge an employee gains about their organisation the longer they are with it, whereas as employees grow older the more likely they are to receive better pay and benefits. The findings were further supported by Yap Peng Lok et al. (2019).

OC has also become an area of increased focus for organisations because of the impact a committed and satisfied workforce can have on an organisation's performance. In their study on team and organisational commitment, Neining et al. (2010) identified the positive impact OC has on several elements such as employees' attitudes to their jobs, their intention to leave, organisational citizenship behaviour, performance and JS. By positively contributing to an employee's performance, the overall performance of an organisation can be improved.

Abdirahman et al. (2018) identified a similar connection in their study on the relationship between JS, and the three elements of work-life balance and OC, and employee performance. Overall, they reported a positive correlation between these elements and this improvement also impacted employee performance.

### *3.3.1.2 Job satisfaction tools and questionnaires*

Job satisfaction has increased in importance both academically and organisationally in the last few years, and several tools, questionnaires and models have been developed to review and study this critical construct. The tools identified in the literature are discussed below.

#### *a) Job Descriptive Index (JDI)*

The first instrument to be discussed is the JDI. This instrument was initially developed by Smith et al. (1987) to support a theory they had developed in 1969 to measure job satisfaction. These days, the JDI is the most comprehensive tool in the measurement of job satisfaction and contains 72 questions and measures five elements (Tasios & Giannouli, 2017).

#### *b) Minnesota Satisfaction Questionnaire (MSQ)*

The MSQ is another well-known measure of job satisfaction and contains 100 questions and measures 20 different dimensions of job satisfaction. The instrument comes in a shorter format with only 20 questions. Of the three factors of JS that can be measured using the MSQ, only one, however, can be measured by the shorter format (Dhammika et al., 2014; Tasios & Giannouli, 2017).

### *3.3.1.3 Components of organisational commitment*

Based on the definition of OC provided in section 3.3.1 and a review of the literature, the key components of OC have been identified. According to Dhammika et al. (2012), the most widely used view of OC is that it can be broken down into three components, namely compliance, identification and internalisation. Compliance relates to extrinsic rewards employees can receive, whereas identification concerns an employees' involvement that is based on a desire to fit it. Internalisation has to do with the match between an employee and the organisation's values. All three of these components combine to provide a detailed explanation of the concept of OC.

In their study, Ndlovu et al. (2018) reviewed organisational commitment and proposed three similar components, namely normative, continuance and affective commitment, based on a review of the literature. Affective commitment is identified as a feeling of identification and involvement that an employee has with and to the organisation and the work that they are doing (Meyer & Allen, 1984; Ndlovu et al., 2018). Continuance commitment is the extent to which the employee is willing to stay with the organisation when compared to the cost of leaving it (Dhar, 2014). Normative commitment is the sense of responsibility the employee feels to remain with the organisation (Mignonac et al., 2015). When reviewing the different components proposed for OC, significant similarities between identification and internalisation and affective commitment came to the fore. These two elements therefore appear to be important to the concept of OC.

A strong influence between leadership and OC was also reported in the study, in particular transformational leadership. According to Khan and Wan Ismail (2017), Malik et al. (2017), Ndlovu et al. (2018) and Trmal et al. (2015), organisational commitment and transformational leadership have a positive relationship, with the behaviours associated with this type of leadership enhancing OC among employees. Lin et al. (2018) identified a positive correlation between benevolent leadership and OC.

### *3.3.1.4 Measures of job satisfaction and organisational commitment*

As discussed, and reviewed in this chapter, JS and OC have an influence on overall organisational performance and are critical constructs for organisations to focus on for a range of validated benefits. To assist with the measurement of these two constructs, tables 3.1 and 3.2 contain a list of possible measures that were identified in the literature.

**Table 3.1***Possible Measures of Job Satisfaction*

	<b>Measures</b>	<b>Source</b>
Job satisfaction	Gender	(Abelha et al., 2018; Roberts & Savage, 1973; Sánchez-Sellero & Sánchez-Sellero, 2017; Yap Peng Lok et al., 2019)
	Length of service	(Ok & Park, 2018; Janićijević et al., 2018; Riza et al., 2018)
	Performance	(Ok & Park, 2018)
	Voluntary turnover	(Abelha et al., 2018; Bakotić, 2016; Koh et al., 2017; Ok & Park, 2018; Yap Peng Lok et al., 2019)
	Age	(Janićijević et al., 2018; Riza et al., 2018; Sánchez-Sellero & Sánchez-Sellero, 2017; Tasios & Giannouli, 2017; Yap Peng Lok et al., 2019)
	Pay	(Janićijević et al., 2018; Riza et al., 2018; Sánchez-Sellero & Sánchez-Sellero, 2017; Schwendimann et al., 2016; Tasios & Giannouli, 2017; Končar & Marić, 2015)
	Low absenteeism	(Abelha et al., 2018; Roberts & Savage, 1973; Schwendimann et al., 2016)
	Leadership	(Abelha et al., 2018; Janićijević et al., 2018; Koh et al., 2017; Schwendimann et al., 2016; Trmal et al., 2015)
	Greater organisational commitment	(Abelha et al., 2018; Koh et al., 2017)

	Autonomy	(Sánchez-Sellero & Sánchez-Sellero, 2017; Schwendimann et al., 2016)
	Achievement	(Sánchez-Sellero & Sánchez-Sellero, 2017)
	Respect from leaders	(Sánchez-Sellero & Sánchez-Sellero, 2017)
	Working conditions	(Janićijević et al., 2018; Končar & Marić, 2015)
	Culture	(El Din & El Ghetany, 2015; Malik et al., 2017; Trmal et al., 2015; Yap Peng Lok et al., 2019)

From the list of possible measures identified in the literature, the following list was deemed to provide a satisfactory indication of job satisfaction owing to the frequency with which it appears, and the likelihood of data being stored on some form of an HRIS within the organisation, as indicated in table 3.2. Possible measures for OC are also included in table 3.3.

**Table 3.2**

*HRIS Measures of Job Satisfaction*

	Measures	Source
Job satisfaction	Length of service	(Janićijević et al., 2018; Ok & Park, 2018; Riza et al., 2018)
	Voluntary turnover	(Abelha et al., 2018; Bakotić, 2016; Koh et al., 2017; Ok & Park, 2018; Yap Peng Lok et al., 2019)
	Age	(Janićijević et al., 2018; Riza et al., 2018; Sánchez-Sellero & Sánchez-Sellero, 2017; Tasios & Giannouli, 2017; Yap Peng Lok et al., 2019)
	Pay	(Janićijević et al., 2018; Končar & Marić, 2015; Riza et al., 2018; Sánchez-Sellero & Sánchez-

		Sellero, 2017; Schwendimann et al., 2016; Tasios & Giannouli, 2017)
	Low absenteeism	(Abelha et al., 2018; Roberts & Savage, 1973; Schwendimann et al., 2016)
	Gender	(Abelha et al., 2018; Roberts & Savage, 1973; Sánchez-Sellero & Sánchez-Sellero, 2017; Yap Peng Lok et al., 2019)

**Table 3.3**

*Possible Measures of Organisational Commitment*

Organisational commitment	Measures	Source
	Low voluntary turnover	(Koh et al., 2017)
	Age	(Yap Peng Lok et al., 2019)
	Absenteeism	(Schwendimann et al., 2016),
	Gender	(Yap Peng Lok et al., 2019)
	Total rewards elements	(Mabaso & Dlamini, 2018; Ndlovu et al., 2018)
	Job satisfaction	(Mabaso & Dlamini, 2018; Yap Peng Lok et al., 2019)

3.3.2 Organisational learning and knowledge management

As the pace at which information and new knowledge are generated continues to quicken, organisations the world over are focusing on ways to better manage this precious resource and to instil a culture of continuous learning in order to gain a competitive advantage. Organisational learning has a positive relationship with a range of benefits such as innovation and enhanced organisational performance and job satisfaction in the literature, and is discussed in this section (Akrofi, 2016; Badri et al., 2006; Cao et al., 2013; Chien et al., 2015; Dermol, 2013; Hernaus et al.,

2008; Jaaron & Backhouse, 2017; Kaplan & Norton, 1992; Mac & Evangelista, 2017; Puteh, 2017; Rašul et al., 2012; Tohidi et al., 2012).

In order to better understand the concepts of Organisational learning and knowledge management, several definitions are included below, and an analysis provided of the most suitable definitions that would be used in this study:

- Knowledge management is defined as “the generation, representation, storage, transfer, transformation application, embedding, and protecting of organisational knowledge” (Schultze & Leidner, 2002, p. 218).
- According to Prax (2000), knowledge management is the process whereby organisations effectively create, convert, lever, capitalise and use their members’ knowledge.
- Senge (1990, p. 3) defined learning organisations as “organisations where people continually expand their capacity to create the results, they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together”.
- Virany et al. (1992) defined organisational learning as a form of informational updating through which managers develop an understanding of the relationships between an organisation’s actions and outcomes.

For knowledge management, the definition provided by Schultze and Leidner (2002) was deemed the most comprehensive and relevant to this study. This was due specifically to the emphasis on the storage and transfer elements in the definition. For organisational learning, the definition formulated by Senge (1990) was deemed the most relevant to the study owing to the different elements it contains. The specific focus by Senge (1990) on continuity was believed to be particularly relevant to the study.

### *3.3.2.1 Organisational learning, knowledge management and organisational performance*

Knowledge has become a critical resource for organisations in the information age, as they seek to gain a competitive advantage and enhance their overall performance. The influence of organisational learning and knowledge management on organisational performance has been identified in the literature and is discussed in detail in this section to convey a better understanding of these critical constructs (Akrofi, 2016; Cao et al., 2013; Dermol, 2013; Hernaus et al., 2008; Jaaron & Backhouse, 2017; Mac & Evangelista, 2017; Puteh, 2017; Rašul et al., 2012).

The interest that many organisations display in generating, acquiring, disseminating and storing knowledge relates directly to its ability to gain an advantage over competitors. The relationship between organisational learning, knowledge management and organisational performance was identified in several studies in the literature that demonstrated the benefit for organisations of instilling these constructs in their day-to-day business (Dermol, 2013; Hernaus et al., 2008).

One of the most effective mechanisms that an organisation can use to gain knowledge is double-loop learning (Jaaron & Backhouse, 2017). Argyris and Schon (1978: 1996) and Jaaron and Backhouse (2017) have described double-loop learning as long-held assumptions about systems and policies being challenged by questioning existing processes and procedures. The result is that organisations can learn and gather knowledge more effectively, because it is not merely based on internal sources, has a larger system-wide focus and allows for the creation of fresh ideas and solutions.

Continued professional development (CPD) is another way in which organisational learning and management of knowledge enhances organisational performance (Puteh, 2017). In the model developed by Puteh (2017), 34.7% of the variance and 24.6% of the prediction for OP was attributed to CPD. Organisations that implement CPD-related activities therefore not only enhance the knowledge of their employees, and employees' engagement with and commitment to the organisation, but they also significantly enhance their overall performance.

According to Mac and Evangelista (2017), there is a correlation between organisational learning, knowledge management and organisational performance. This came to light in their study on learning and export performance. One of the main enablers identified in their study was knowledge management and a culture of continuous learning. The findings of their study were significant in that they established that the correlation between organisational learning, knowledge management and organisational performance was due to the systemic effect that knowledge management and organisational learning have on an organisation, which ultimately enhances performance (Mac & Evangelista, 2017).

While knowledge management has a relationship with organisational performance and a range of other benefits, its dependence on other elements within an organisation to realise these benefits has been identified in the literature. The most significant of these dependencies is on technology (Cao et al., 2013; Choe, 2016; Rašul et al., 2012).

The main areas in which technology was identified as having a significant impact on knowledge management was its storage, searching for information and transfer (Choe, 2016). IT infrastructure was further highlighted by Choe (2016) as a critical element of translating knowledge management into organisational performance.



Cao et al. (2013) highlighted as a significant issue, organisations underestimating the impact of IT on their attempt at knowledge management. Their study focused on the crucial interaction and relationship between IT, human resources and the affected processes as being key to successful knowledge management. Rašul et al. (2012) also supported this view.

### 3.3.2.2 *Organisational learning, knowledge management and innovation*

Innovation has been identified in the literature as a key enabler of growth in most organisations and assists organisations to gain a competitive advantage over their rivals (Chien et al., 2015; Tohidi et al., 2012). This section will therefore provide a greater understanding of the relationship between organisational learning, knowledge management and their effect on innovation (Chien et al., 2015).

In their study on organisational learning styles and their impact on innovation performance, Chien et al. (2015) identified innovation as a critical reason why organisations continued to exist and perform. The following four learning styles were identified and are listed below:

- *Experimentation*. Organisations learn by trying many new ideas and experimenting.
- *Competency acquisition*. This involves learning through the acquisition of additional competencies and by individuals and teams.
- *Benchmarking*. This is a way of learning characterised by studying others and then attempting to adapt the knowledge for their own organisation.
- *Continuous improvement*. This entails learning through constantly improving on what has been done before and then moving on once all the steps have been mastered.

The findings of the study indicated that organisations use the best learning style based on a combination of internal capabilities and the strength of external relationships. In several of the combinations, experimentation was found to be the best way for an organisation to learn. This was followed by continuous improvement (Chien et al., 2015).

In a related study on organisational learning and innovation, Tohidi et al. (2012) proposed a model with the following five dimensions of organisational learning: Managerial commitment and empowerment, experimentation, risk taking, interaction with the external environment and openness, and knowledge transfer and integration.

Based on the above list, a relationship was identified in Chien et al.'s (2015) study, specifically with regard to experimentation and interaction with the external environment and the openness

constructs identified by Tohidi et al. (2012). The correlation results of the model created by Tohidi et al. are highlighted in table 3.4.

**Table 3.4**

*Correlation Results with Innovation*

	<b>Managerial commitment and empowers (MCE)</b>	<b>Knowledge transfer and integration (TI)</b>	<b>Openness and interaction with the external environment (ENV)</b>	<b>Experimentation (EXP)</b>	<b>Risk taking (RISK)</b>	<b>Organisational Learning Capability (OLC)</b>
<i>Innovation Pearson correlation</i>	0.416	0.616**	0.656**	0.462	0.625	0.814**
<i>Sig. (two-tailed)</i>	0.008	0.006	0.003	0.000	0.003	0.000
<i>n</i>	18	18	18	18	18	18

*Note: \*Correlation is significant at the 0.01 level (two-tailed).*

*Note.* Correlation results with innovation. From Organisational learning measurement and the effect on firm innovation by Tohidi et al., 2012, *Journal of Enterprise Information Management*, 25(3), p. 238

The results for the composite reliabilities, Cronbach alphas, standardised loadings, and correlations between the dimensions of the OLC second-order factor model are provided in table 3.5.

**Table 3.5**

*Composite Reliabilities, Cronbach Alphas, Standardised Loadings and Correlations between the Dimensions of the OLC Second-order Factor Model Results*

<i>Concepts</i>	<b>Number of items</b>	<b>Cronbach alpha</b>	<b>Composite reliability</b>	<b>Standardised loadings</b>	<b>T-value</b>	<b>R squared</b>
<i>MCE</i>	6	0.823	0.857	0.92	10.2	0.84
<i>TI</i>	5	0.77	0.709	0.74	9.36	0.54
<i>ENV</i>	5	0.73	0.695	0.7	6.69	0.5
<i>RISK</i>	3	0.81	0.79	0.89	4.12	0.79
<i>EXP</i>	4	0.837	0.8	0.9	6.18	0.8
<i>OLC</i>	23	0.889	0.918			

The results show that a statistically significant portion of the variance of the constructs, MCE to EXP, was explained.

The overall model fit indices of the study conducted by Tohidi et al. (2012) are provided in table 3.6.

**Table 3.6**

*Model Fit Indices Results*

<b>Chi-square/degrees of freedom</b>	<b>P-value</b>	<b>Goodness of fit index</b>	<b>Root mean square error of approximation</b>	<b>Normal fit Index</b>	<b>Non-normed fit index</b>	<b>Incremental fit index</b>	<b>Comparative fit index</b>	<b>Relative fit index</b>	<b>Fit indices</b>
1.65	0.000	0.84	0.062	0.91	0.95	0.96	0.96	0.9	Result of the model Appropriate value
<3	<0.01	Close to 1	<0.1	>0.9	>0.9	>0.9	>0.9	>0.9	

*Note.* Correlation results with innovation. From Organisational learning measurement and the effect on firm innovation by Tohidi et al., 2012, *Journal of Enterprise Information Management*, 25(3), p. 237.

The results of Tohidi et al.'s (2012) study confirmed that the model was valid with the five dimensions supported by the various fit indices used to assess it, and it could be used by management in an organisation to improve its learning capabilities. The root mean squared residual (SRMR) and root mean square error of approximation values of 0.065 and 0.062 were found to be within the cut-off points. The model was therefore deemed a good fit.

*3.3.2.3 Measures and tools of organisational learning and knowledge management*

A critical aspect of this study was the formulation of a key set of measures or measurable elements that could be utilised for each of the key organisational success factors identified in the literature. This section provides a comprehensive list of measures identified for organisational learning and knowledge management, and also explains some of the tools and models identified to measure organisational learning in the literature.

*a) Kelly's Personal Construct Theory and other theories*

The first measurement tool to be discussed is the tool kit proposed by Fuglseth and Grønhaug (2003), who reviewed a collection of organisational learning theories to provide a means for

measuring the construct. The focus of their study was on several theories and centred mainly on Kelly's Personal Construct Theory.

The focus of the theories reviewed by Fuglseth and Grønhaug (2003) was on cognitive learning theories. These theories "attempt to explain learning by considering changes in individuals' knowledge structures and information processing" (Fuglseth & Grønhaug, 2003, p. 1489)

One problem with the tool kit developed, however, is that it does not focus on the analysis of information to provide indications of organisational learning. This was highlighted in the study as an area for further research.

#### b) Dimensions of Learning Organisations Questionnaire (DLOQ)

The DLOQ was developed by Marsick and Watkins (2003) in the USA to assess an organisation's capability to learn, and is a valuable tool to provide information on how an organisation can improve its learning capability. The DLOQ comes in two versions with the longer format containing 43 measurement items, and the shorter version 21 items (Leufvén et al., 2015).

The DLOQ contains the following seven constructs that were identified to assess organisational capability to learn: (1) create continuous learning and opportunities; (2) promote inquiry and dialogue; (3) encourage collaboration; (4) create systems to capture and share learning; (5) empower people towards collective visions; (6) connect the organisation to its environment; and (7) provide strategic leadership for learning.

Of the constructs listed above, "Create systems to capture and share learning" was directly correlated to this research and other findings in the literature regarding the dependence of knowledge management on technology to prove effective.

The findings of the study conducted by Leufvén et al. (2015) indicated that the DLOQ could be used in lower-income countries, more specifically in Nepal where their study was conducted.

#### c) Measures identified in the literature

A critical part of the study was to develop a set of measures that could be used to assess the strength of key success factors in an organisation using the organisation's HRIS. Table 3.7 contains a

list of possible measures of organisational learning and knowledge management, which were identified in the literature.

**Table 3.7**

*Measures of Organisational Learning and Knowledge Management Using an HRIS*

	<b>Measures</b>	<b>Source</b>
Learning and knowledge management	Technology used to support knowledge management	(Cao et al., 2013; Choe, 2016; Dermol, 2013; Jaaron & Backhouse, 2017; Leufvén et al., 2015; Mac & Evangelista, 2017; Rašul et al., 2012; Tohidi et al., 2012)
	Elements of a good KM system	(Goodhue & Thompson, 1995)
	Managerial commitment and empowerment, experimentation, interaction with the external environment and openness, knowledge transfer and integration and risk taking	(Tohidi et al., 2012)
	Job satisfaction	(Chiva & Algere, 2009; Tohidi et al., 2012)
	Organisational learning styles	(Chien et al., 2015)
	Double-loop learning	(Jaaron & Backhouse, 2017)
	Open systems thinking, individual capabilities, learning-oriented teams, continually updated mental models and cohesive visions	(Davies & Nutley, 2000)
	CPD	(Puteh, 2017)

From the list of possible measures identified in the literature, it was found that only a few relate specifically to systems or system-related elements. The list provided in table 3.8 was refined to include only those elements that could be drawn from an organisational type of HRIS.

**Table 3.8**

*HRIS-related Measures*

	<b>Measures</b>	<b>Source</b>
Learning and knowledge management	Technology used to support knowledge management	(Cao et al., 2013; Choe, 2016; Dermol, 2013; Jaaron & Backhouse, 2017; Leufvén et al., 2015; Mac & Evangelista, 2017; Rašul et al., 2012; Tohidi et al., 2012)
	Elements for a good KM system	(Goodhue & Thompson, 1995)
	CPD activities	(Puteh, 2017)
	Job satisfaction	(Tohidi et al., 2012)

### 3.3.3 Internal business processes

As organisations seek ways to enhance the way they do business and to gain a competitive advantage over their rivals, approaches such as process orientation and process management aimed at enhancing business processes have been identified as ways that organisations can gain a competitive advantage and improve their overall performance (Akpoviroro et al., 2019; Cao et al., 2013; Hellstrom & Eriksson, 2013; Kalinowski, 2016; Lamberta & Ouedraogo, 2008; Leyer et al., 2017; Oladimeji et al., 2017; Pattanayak & Roy, 2019).

This section on organisational success factors reviews business processes and their contribution to organisational performance, provides a definition of the construct, discusses the elements that can

be used to measure and assess business processes in organisations and reviews the different models currently being used to enhance business processes.

To ensure that a shared understanding of business processes, as they relate to organisational success factors, is conveyed, several definitions of the construct are provided below.

- Business processes involve “[t]he degree of explicit definition, management, measurement, control and effectiveness a process has” (Humphrey, 1987, pp. 1–13)
- Sidikat and Ayanda (2008) defined business process simply as a set of activities that transforms a set of inputs into a set of outputs for another person using people and equipment.
- Process innovation has been defined as the creation and implementation of new concepts and methods in manufacturing companies (Shahzad et al., 2012).
- Processes involve information on how the resources in an organisation are combined to generate outputs in terms of products and services (Bititci et al., 2011).
- Business processes are defined as any activity or group of activities that takes one or more inputs, transforms them and provides one or more outputs for its customers (Krajewski et al., 2010).

When reviewing the above definitions, they all appear to have several elements in common namely inputs, outputs and steps involved in changing the one into the other. The definition deemed to best describe business processes is that of Sidikat and Ayanda (2008) – hence its use in this study.

### *3.3.3.1 Business processes and organisational performance*

The influence that business processes have on organisational efficiency and their performance has been studied extensively over the last several years, as organisations continue to strive to gain a competitive advantage and extract as much value out of their operations as possible. This section focuses exclusively on the relationship between business processes and organisational performance, as identified in the literature.

The way in which organisations endeavour to enhance their business processes may differ when reviewing the literature, and several different mechanisms have been identified for this purpose, ranging from ISO 9001, total quality management (TQM) and business process re-engineering to broader and more general frameworks and classifications (Hellstrom & Eriksson, 2013; Kalinowski, 2016; Lamberta & Ouedraogo, 2008; Oladimeji et al., 2017; Pattanayak & Roy, 2019). The goal of these various approaches is best articulated by Cole and Scott (2000), who stated that process orientation has been called perhaps the most important management idea of the past 20 years, with

the overall aim being to enhance organisational performance through the refinement of business processes.

For organisations there is a clear correlation between business processes and increased performance based on the studies reviewed, and it is therefore critical that they ensure alignment between their business processes and strategy, as well as by streamlining their existing processes to extract the maximum value from their operations (Kalinowski, 2016; Oladimeji et al., 2017; Pattanayak & Roy, 2019). Pattanayak and Roy (2019) reviewed the importance of business processes to supply chain management in their study and the effect that this had on organisational performance. They found that when processes were aligned internally along with external suppliers and customers, organisational performance was significantly enhanced. Technology was also identified in the study as an enabler of the alignment and enhancement of existing processes, with this also being supported by Akpoviroro et al.'s (2019) research.

In their study on process orientation, Hellstrom and Eriksson (2013) analysed four applications of process orientation, namely fumlbers, talkers, mappers and organisers. Fumlbers are organisations that do not have well understood or consistent processes; talkers understand processes verbally without formal structures; mappers focus more on the visual depiction of processes than on the verbal and map out their processes; and organisers have formal structures in place for processes, they are well understood and there are people in charge of the processes in the business.

The classifications of process applications discussed by Hellstrom and Eriksson (2013) relate closely to the maturity levels reviewed in a study on the Capability Maturity Model (CMM) by Kalinowski (2016). The levels of organisational process maturity used by the CMM classify organisations into one of the following five maturity categories: initial, repeatable, defined, managed and optimised, ranging from least to most mature. The findings of the study identified organisations at higher levels of process maturity as having greater overall performance.

One of the principal findings of the study was the following six key process elements: modelling, deployment, optimisation, management, culture and structure (Hellstrom & Eriksson, 2013). Some of these key elements were also identified by Oladimeji et al. (2017) as a collaborative working environment, top management commitment and support, IT infrastructure, training and a less bureaucratic structure. The common elements were structures and management.

Based on the results, the more consistent, documented, understood and measured processes were within an organisation, the more likely employees were to buy into them and therefore enhance organisational performance. To this end, mappers and organisers in process orientation application proved to be the most successful (Hellstrom & Eriksson, 2013).



### 3.3.3.2 *Business processes and innovation and knowledge management*

#### a) Innovation

As explained previously, business processes entail the way in which inputs are turned into outputs, and are therefore critical to any organisation's functioning. Their effects when managed efficiently, such as on organisational performance, have already been discussed, but this section attempts to provide greater clarity on the correlation between business processes, innovation and knowledge management, which, as identified in the literature, is significant and positive (Akpoviroro et al., 2019; Cao et al., 2013; Lamberta & Ouedraogo, 2008; Leyer et al., 2017).

As organisations move towards improving the way they function, innovation becomes critical. For most organisations, their focus on innovation normally relates only to new products and/or services and rarely relates to an improvement in their processes (Akpoviroro et al., 2019). To perform, however, organisations need to ensure that methods used to do the work are as efficient as possible – hence the fact that innovation of processes is equally important (Akpoviroro et al., 2019; Leyer et al., 2017).

According to Hartmann (2006), innovation of processes has been correlated with four positive benefits for an organisation. The first benefit is the market position, meaning that the company can set the standard for the industry that becomes a barrier to competitors. The second is applying new technologies, which enable the company to overcome past weaknesses, and the process to reach its full potential. This is referred to as resource utilisation and relates to the renewal and transformation of the organisation. Third are the benefits that relate to the whole organisation, such as process capture commitment, innovation, and creativity. It additionally fosters new thinking and increases the organisation's ability to recruit the best people. The fourth benefit is the ability to speed up time to market, which provides a competitive edge or delays development to acquire better information to bring products to the market better suited to the customers.

The results of Akpoviroro et al.'s (2019) study indicated the effect process innovation had on organisational performance and this was tested and statistically confirmed. The results are provided in tables 3.9 and 3.10.

**Table 3.9***Model Summary Results*

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.721(a)	.519	.485	.64386

*Note.* Business Process Innovation and Organisational Performance Model Summary Results. From The impact of process Innovation on Organisational Performance by Akpoviroro et al., 2019, *AUDOE*, 15(2), p. 126

**Table 3.10***Model Summary Results*

Model		Sum of squares	Degrees of freedom	Mean square	F-value	Significance
1	Regression	37.192	6	6.199	14.952	.000(a)
	Residual	34.408	83	.415		
	Total	71.60	89			

*Note.* Business Process Innovation and Organisational Performance Model Summary Results. From The impact of process innovation on organisational performance by Akpoviroro et al., 2019, *AUDOE*, 15(2), p. 126.

Benefit 2 is of vital importance for modern organisations as they increasingly turn to technology to reduce administration and increase efficiency. It offers tools to the organisation that allows for faster processing and decision making and the ability to identify areas where improvements can be made.

In their study on innovation, performance and organisational process design, Leyer et al. (2017) identified several organisational design components that promote innovation and organisational performance. These are a process-oriented organisational structure, a focus on process improvement activities, personal autonomy to deviate from standards that allows employees to deviate from established action sequences, task and process knowledge that involves having some knowledge of the activities performed by colleagues as they relate to the final product or service of this process, and customer focus knowledge of the contribution being made relates to which product or service work contributes to this process.

Overall, it is clear from the literature, that there is a relationship between business processes and innovation in organisations. Hence for organisations to promote innovation among their staff, they

need to focus on key areas such as provision of autonomy for employees, mapping out their processes, designing the organisation from a process perspective and making increased use of technology.

b) Business processes and knowledge management and organisational learning

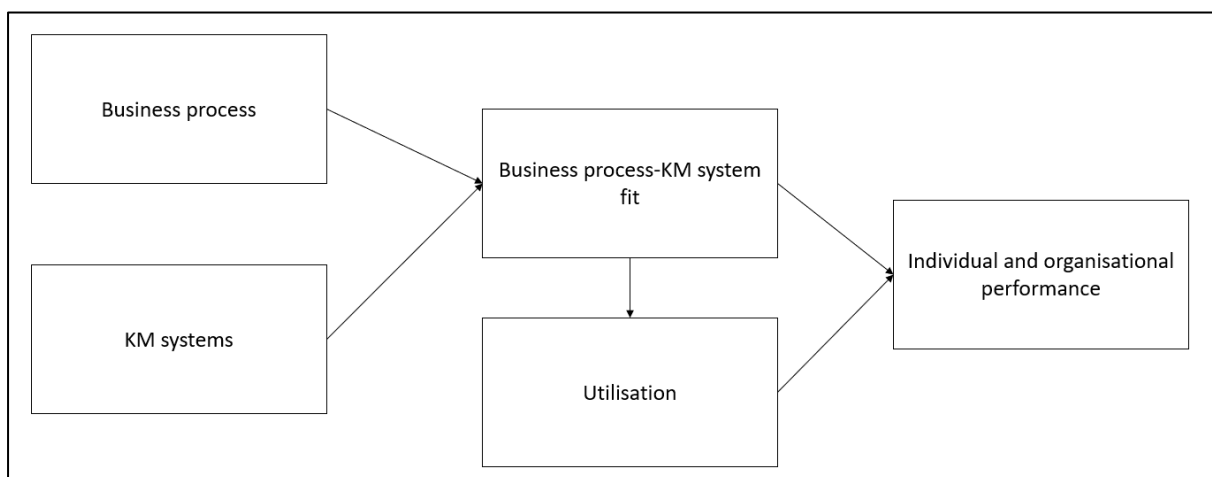
The second key construct to be discussed in this section is the relationship between business processes and knowledge management and organisational learning. Several studies were identified in the literature that highlighted the importance of business processes to knowledge management (KM) and organisational learning (OL) (Cao et al., 2013; Lamberta & Ouedraogo, 2008).

For most organisations, the ability to manage and share knowledge is a critical means for overcoming problems and formulating new solutions to solving them. As organisations continue to adapt to the new world of work, many seek to implement systems to assist with KM. Cao et al. (2013) studied the relationship between business processes, knowledge management systems and organisational performance and concluded that in order to succeed, any KM system would need to incorporate the employee and process elements along with technology.

Cao et al. (2013) formulated a model of the relationship between the various constructs. The research framework is depicted in figure 3.1.

**Figure 3.1**

*Research Framework*



*Note.* Research Framework. From Investigating the role of business processes and knowledge management systems on performance: A multi-case study approach by Cao et al., 2013, *International Journal of Production Research*, 51(18), p. 5567.

The model focused on two constructs namely, KM systems and business processes which, when fitted together correctly, lead to KM system utilisation and then individual and organisational performance. Business processes are therefore depicted in the model as being critical to the use of KM systems and have an impact on performance.

In their study on the relationship between ISO 9001 quality management, OL and organisational performance, Lamberta and Ouedraogo (2008) found that a positive correlation existed between the constructs. Two types of learning were identified to have an impact on processes and performance, specifically operational learning and conceptual learning. ISO 9001 was also found to be an excellent tool for OL and KM in an organisation.

### *3.3.3.3 Business process models and management tools*

When reviewing the literature on business processes and their correlation with organisational performance, several performance models were identified that were deemed relevant to this study. The models, a description of each and analysis of their strengths and weaknesses are presented below.

#### *a) Capability Maturity Model (CMM)*

The CMM model focuses on different levels of maturity regarding processes within an organisation and provides classifications to describe the different maturity levels of these processes (Kalinowski, 2016). The model was first developed by the Software Engineering Institute (SEI)/ Carnegie Mellon University, initially focusing on software development, but was later used for different purposes. The model uses the following five maturity levels to classify organisations: (1) initial refers to processes that are informal and not planned; (2) repeatable refers to processes that are documented and can be repeated; (3) defined refers to processes that are standardised across the organisation; (4) managed refers to processes that are managed quantitatively according to prescribed metrics; and (5) optimised refers to processes that are measured and that lays the foundation for continued improvement and optimisation.

Kalinowski (2016) identified a correlation between the model and increased organisational performance as the organisation matures and thereby the supporting structures and systems within the organisation. The result is that the organisation's overall performance improves. Metrics such as

time, costs, productivity, quality and capital can be used once processes have been optimised to determine the overall improvement (Kalinowski, 2016).

Overall, the CMM model provides a means of categorising organisational maturity relating to its processes, and its strengths are as follows:

- The categories used are specific and logically build on the preceding one, resulting in a clear understanding of the differences between each.
- The provision of categories allows for a result that helps leaders in an organisation to identify the gap between where they are and where they need to be.
- There is an established relationship with organisational performance.

The weaknesses of the model are as follows:

- The use of technology does not feature in the maturity levels.
- There is no reference to the maturity of staff within the organisation in any of the levels and the influence that employees have on processes.

#### b) [Business process reengineering](#)

Business process re-engineering (BPR) is a management discipline for analysing and redesigning current business processes and their components in terms of efficiency, effectiveness and added value to the objectives of the business (Herzog et al., 2007). The construct began in the late 1980s and has since garnered a lot of attention from business and the academic community because of the principles it provides to streamline and improve process.

The construct of BPR has five elements that were identified in the literature that led to successful implementation. The first is a collaborative working environment. Second is top management commitment and support. Adequate IT infrastructure and training are the third and fourth elements. The fifth and final element is a less bureaucratic structure.

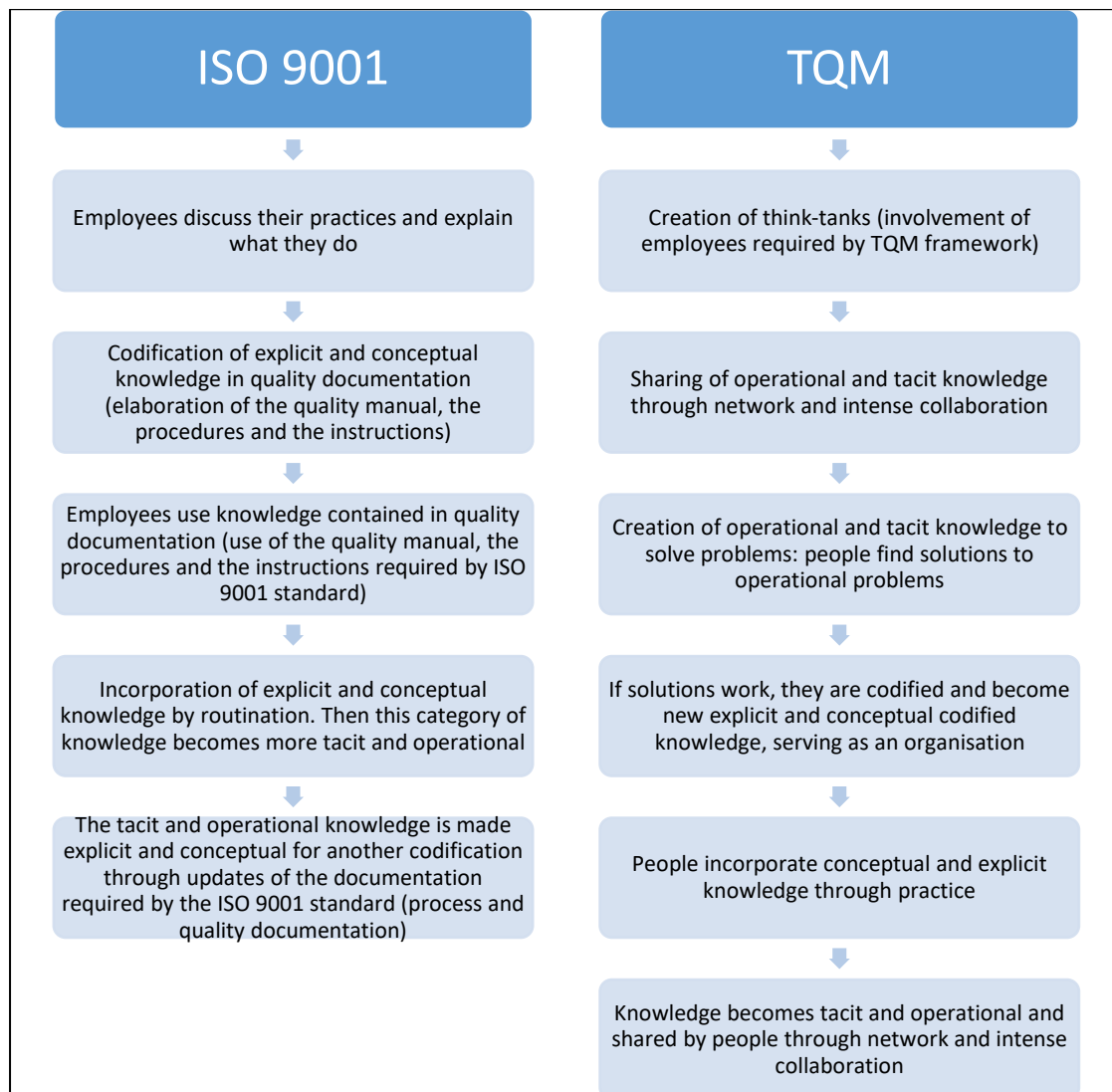
When reviewing the list, the elements involved in the successful implementation of BPR in an organisation cut across several organisational functions and require input and support from different areas of the organisation to ensure its success. BPR has also been correlated to organisational performance in the literature and provides an organisation with a means to enhance its processes to the benefit of all.

c) ISO 9001 & total quality management (TQM)

In their study on ISO 9001, Lamberta and Ouedraogo (2008) found that the quality management system had an effect on organisational learning and process performance. The ISO 9001 quality management process is a means whereby organisations ensure that there is consistency in their processes and that they can reproduce their actions through what they have documented. The differences between ISO 9001 and TQM were discussed in Lamberta and Ouedraogo's (2008) study, and are indicated in figure 3.2.

**Figure 3.2**

*Comparison between ISO 9001 and TQM*



*Note.* Comparison between ISO 9001 and Total Quality Management. From Empirical investigation of ISO 9001 quality management systems' impact on organisational learning and process performances by Lamberta & Ouedraogo, 2008, *Total Quality Management*, 19(10), p. 1075.

The study provided valuable insight into the TQM and ISO 9001 quality management practices, as per the figure above. The major difference highlighted between ISO 9001 and TQM was its overall focus. ISO 9001 was identified as a systematic way of managing processes and is company specific, whereas TQM is a more of a cultural change focusing on quality.

Both ISO 9001 and TQM have become increasingly important in the last several years owing to their ability to assist organisations with quality and provide them with a framework to manage constructs such as their processes better and more efficiently (Lamberta & Ouedraogo, 2008).

### 3.3.3.4 Measures

The last section on business processes includes the list of possible measures identified in the literature, which the researcher believed can be used to assess processes within an organisation and their impact on its overall performance. Measures identified in the literature are provided in table 3.11.

**Table 3.11**

*Possible Measures of Mature Business Processes*

	Measures	Source
Business processes	Time, quality, cost, productivity and capital	(Kalinowski, 2016)
	CMM maturity levels criteria	(Kalinowski, 2016)
	Processes mapped	(Akpoviro et al., 2019)
	Process oriented organisational structure and improvement focused	(Leyer et al., 2017)
	Personal autonomy – deviation from standards	(Leyer et al., 2017)
	Task knowledge – process knowledge	(Leyer et al., 2017)
	Customer focus – knowledge with regard to contribution	(Leyer et al., 2017)

Since one of the aims of this study was to design a model to allow data to be drawn from an organisation’s HRIS, the measures to be used to assess performance need to be broad to provide an indication of how processes function within an organisation. The assumption of the model, as discussed earlier, is that most organisations do not have a sophisticated HRIS, that is, workflow and analytics capable; instead, it is a basic tool used for paying employees, and processing new engagements, movements and terminations. Based on this thinking, the list of possible measures indicated in table 3.12 was deemed the most relevant to the study for a review of organisational processes.

**Table 3.12**

*Possible Measures of Mature Business Processes Using an HRIS*

	<b>Measures</b>	<b>Source</b>
Business processes	CMM maturity levels criteria	(Kalinowski, 2016)
	Processes mapped	(Akpoviro et al., 2019)
	Process-oriented organisational structure and improvement focused	(Leyer et al., 2017)

If an organisation has a more sophisticated HRIS capable of workflow, then other process measures identified in the literature such as cost and productivity could be used to assess the quality of processes within the organisation.

### 3.4 Reflections and link to study objectives

From the literature review of organisational success factors conducted in this chapter it was concluded that the identified factors could be used to provide an indication of organisational success and a list of possible measures for each could be provided. The chapter provides a positive contribution to the study and its objectives of identifying factors and their measures that could be used a means to assess organisational success by conceptualising the constructs of job satisfaction and organisational commitment, organisational learning and knowledge management and internal business process and their key components from a theoretical perspective.



### 3.5 Chapter summary

In this chapter, job satisfaction, organisational learning and knowledge management and internal business process as OFSs were reviewed and defined. The different influences of each of these factors was discussed. Several prominent theories and tools for each of the factors were then reviewed and explained. Reflections of the literature review conducted and the link to the study objectives was also discussed. Finally, a possible list of measures that could be used to assess the health of each of the factors was reviewed, as identified in the literature, and a final possible list was formulated believed to be related to technology within the organisation.

In chapter 4, organisational leadership is defined. The various components of organisational leadership are identified and discussed, as found in the literature. Organisational leadership's influence on organisational success is explained and existing types of organisational leadership reviewed and discussed.

## Chapter 4: Organisational Leadership

Leadership is a topic of ongoing research and has been identified as a key organisational success factor. The primary reasoning behind this is that as the world changes, organisations are increasingly relying on leaders to move them forward and remain relevant.

Contemporary organisations find themselves in a world that changes not only constantly and quickly but requires a new breed of leader. For these new leaders the old models of managing employees as being replaceable like equipment, and conducting business according to a set and unchanging model, are things of the past. New leaders need to consider a wide range of issues and the influence that they have on many aspects of an organisations functioning, such as its culture, processes, employees' behaviour and embodiment of the organisations' values (Choi et al., 2017; Dhammika et al., 2014; Ejere & Abasilim, 2013; Khan & Wan Ismail, 2017; Malik et al., 2017; Phong et al., 2018; Saravo et al., 2017; Sheshi & Kercini, 2017; Trmal et al., 2015; Vanebo et al., 2015).

The aim of this chapter is to provide a greater understanding of the concept of leadership and its key components. The components of focus will be on defining leadership and its core leadership influences. Different leadership types, such as transformational, transactional, ethical, as well as other types of leadership identified in the literature will then be discussed.

### 4.1 Defining leadership

Owing to leadership being a topic of intense research, the purpose of this section is to provide a definition of leadership that can be used throughout the study, and most importantly in the model created on organisational success factors and HRISs. To this end, the following definitions of leadership are provided as they were identified in the literature, with each offering a different perspective on the importance of effective leadership:

- According to De Jong and Hartog (2007), leadership can be defined as the process of shaping employees towards a desired outcome.
- Meng and Berger (2013) formulated a different definition of leadership in which they defined it as the capacity of individual practitioners to exert their influence in the organisation.
- Bass (1990) defined leadership as an interaction between two or more members of a group that often involves a structuring or restructuring of the situation and the perception and expectations of the members. Leadership occurs when one group member modifies the motivation or

competencies of others in the group. Any member of the group can exhibit some amount of leadership. Hence leadership is defined as an instrument of goal achievement.

- “A leader is one or more people who selects, equips, trains, and influences one or more follower(s) who have diverse gifts, abilities, and skills and focuses the follower(s) to the organisation’s mission and objectives causing the follower(s) to willingly and enthusiastically expend spiritual, emotional, and physical energy in a concerted coordinated effort to achieve the organisational mission and objectives” (Winston & Patterson, 2006, p. 7).
- According to Gandolfi and Stone (2016), leadership is an intentional means by which a leader influences a group of people in an organisation to a widely understood future state that is different from the present one. They further provide specific components of leadership as follows:
  - (1) There must be one or more leaders, (2) leadership must have followers, (3) it must be action oriented with a legitimate, (4) course of action, and there must be (5) goals and objectives.
- As suggested by extant literature, leadership reflects an interpersonal skill that is used to influence followers to strive for the common good in organisations (Barrow 1977; Parris & Peachey 2013; Plsek & Wilson 2001).
- Leadership has been described as the process of social influence in which one person can enlist the aid and support of others in the accomplishment of a common task (Chemers, 1997).

When reviewing the above definitions of leadership, it becomes evident that there are several different interpretations of this influential construct. Many of the above definitions share several similar elements, such as striving towards a common goal or desired outcome, interactions between the leader and their followers and a means of reskilling or upskilling followers.

In this study, the definition formulated by Gandolfi and Stone (2016) was chosen owing to the effective means it is deemed to articulate regarding what leadership entails. Additionally, it refers to influence that encapsulates communication at its core, which is critical for leaders in interactions with their followers.

## 4.2 Core leadership influences

To understand the impact of modern leaders on employees, teams and organisations, this section endeavours to provide a better understanding of the two elements impacted by leadership, relationships and decision making, as reviewed and identified in the literature and regarded as

important when understanding the influences leaders have (Choi et al., 2017; Lord, 1977; Min et al., 2016; Shabnam & Tung, 2013; Vanebo et al., 2015).

#### 4.2.1 Relationships

At the core of a review of leadership, a discussion on relationships would be essential. This is because to lead, an individual needs to interact with and influence others' behaviour and perceptions (Lord, 1977; Vanebo et al., 2015). It is through the construction and maintenance of relationships that a leader's followers will accomplish their goals and objectives.

In their study of values-based leadership closely correlated to transformational leadership, Vanebo et al. (2015) mentioned three critical skills for an effective leader, namely human, technical and conceptual skills, with human as one of the most crucial skills a leader could possess. This skill allows leaders to work in a team and build the necessary connections with their employees that allow for the achievement of goals and objectives.

In reviewing relationships, team effectiveness was identified as a critical aspect, as well as its relationship with organisational performance (Choi et al., 2017). Leadership was found to have a significant influence on team effectiveness and organisational performance (Choi et al., 2017). Through leadership styles such as shared leadership, teamwork is actively promoted and enhanced by the leader. The connection leaders have with their teams therefore allows them to effect meaningful and sustainable change in teams' behaviour and thereby impact the rest of the organisation.

Lord (1977) reviewed leadership decades ago by analysing the processes that leaders effect and enact. The results of Lord's (1977) study are contained in table 4.1.

**Table 4.1**

*Leadership Functions and Empirical studies*

Leadership functions	Experimental studies			Nonexperimental studies		
	Kirscht, Lohadi and Haire (1959)	Carter et al. (1951)	Borgotta and Bales (1956)	Kahn (1958)	Bowers and Seashore (1966)	Hemphill and Coons (1957)
Task-related Functions						
Developing orientation	Specifying problem	Diagnoses and interprets	Gives orientation			Objective attainment behavior
Facilitating information exchange	Soliciting information	Asks for information	Asks for opinions			

Facilitation evaluation, analysis and integration	Integrating information	Gets insight and analyses situation	Gives opinions			
Developing plans	Suggesting courses of action	Proposes courses of action	Give suggestions		Work facilitation	
Proposing solutions	Proposing solutions					
Initiating required behavior		Initiates required actions				
Coordinating behavior		Integrates group behavior			Work facilitation	
Removing barriers and providing resources				Enabling goal achievement	Work facilitation	
Attaining high task motivation				Modifying employee goals	Goal emphasis	
Fulfilling nontask needs of member				Direct need satisfaction	Support	
Reducing or preventing conflict	Securing consensus	Asks for expression of feelings	Asks for opinions			Group interaction facilitation
Developing positive emotional atmosphere		Asks for expression of feelings	Asks for opinions		Interaction facilitation	Group interaction facilitation

*Note.* Leadership Functions and Empirical studies. From Functional leadership behaviour: Measurement and relation to social power and leadership perceptions by Lord, 1977, *Administrative Science Quarterly*, 22, p. 4.

Lord (1977) identified several processes that were deemed to be the primary functions of leadership. Among the functions identified as the most important, in terms of relationships, were coordinating behaviour, reducing or preventing conflict and developing positive emotional atmosphere. All these functions seek to enhance teamwork and cooperation and thereby enhance the organisation's performance.

Although Lord's work was completed several decades ago, there are several elements that are still regarded as relevant and important for leaders of today. These elements all relate to the creation of a positive environment for followers and managing conflict, thereby ensuring that mutual goals and objectives are met. Of the different elements leadership influences identified since the studies conducted by Choi et al. (2017), Lord (1977), Min et al. (2016), Shabnam and Tung, (2013) and Vanebo et al. (2015), creativity and innovation are additions of the relationship element of

leadership, as identified by Min et al. (2016), that are deemed critical. Leaders who exhibited integrity and engaging behaviour with their followers were found to have the greatest influence on their followers' creativity (Min et al., 2016). This, in turn, allowed followers the freedom to come up with new ideas and new ways of doing things. Innovation in this regard has the potential to alter the way an organisation works, as well as to enhance the products and services it provides.

#### 4.2.2 Decision making

The ability of leaders to make decisions and empower their followers to do the same is a critical requirement for modern organisations and allows its workforce to adapt to changing circumstances and environments. Several elements of leadership have already been discussed, but in this section a leader's ability to make decisions is the area of focus (Choi et al., 2017; Shabnam & Tung, 2013)

Emotional intelligence (EI), analytical intelligence (IQ) and spiritual intelligence (SI) are all correlated with effective leadership and thus a leader's ability to make decisions (Shabnam & Tung, 2013).

According to these studies, the ability to weigh up information and choose the best course of action is a critical leadership ability and therefore requires a leader who incorporates several aspects of intelligence and not just traditional IQ. By applying several different intelligence elements, leaders are better able to lead their teams.

Through the application of leadership principles and methods leaders can also enhance the decision making of their team and promote its functioning. Leaders encourage knowledge sharing that enables team members to learn at an increased pace and apply their newly gained knowledge to the decisions they make. A leader's ability to share information was found to have enhanced group decision making and team performance (Choi et al., 2017).

### 4.3 Transformational leadership

Research on leadership has intensified over the last few decades with many scholars reviewing and analysing aspects of what was described by Burns (1978), Bass (1985), Dhammika et al. (2014) and Khan and Wan Ismail (2017) as transformational leadership. This type of leadership has been the subject of several hundred studies and reviews over the last few decades (Choi et al., 2017; Dhammika et al., 2014; Ejere & Abasilim, 2013; Khan & Wan Ismail, 2017; Malik et al., 2017; Phong et al., 2018; Saravo et al., 2017; Sheshi & Kercini, 2017; Trmal et al., 2015; Vanebo et al., 2015).

Transformational leadership refers to leaders with an appealing vision for their team who intellectually stimulate others in a way that is demanding, and are appreciative of the individual needs of the team members (Yukl, 2013). Transformational leadership deals with the following four primary elements: (1) idealised influence; (2) inspirational motivation; (3) intellectual stimulation; and (4) individual consideration.

#### 4.3.1 Idealised influence

One of the main elements of transformational leadership is idealised influence. According to the literature reviewed, idealised influence is subdivided into two distinct parts, namely the behavioural and the attribute components.

The attribute component deals with leaders who act as role models to their followers and are driven by consideration for the interests of their followers. The behavioural component relates to the charisma of leaders and their ability to instil in others a sense of purpose (Dhammika et al., 2014; Khan & Wan Ismail, 2017; Malik et al., 2017; Phong et al., 2018; Saravo et al., 2017; Trmal et al., 2015).

#### 4.3.2 Inspirational motivation

Another critical element of transformational leadership, as discussed in the literature, is that of inspirational motivation. This element deals with leaders' ability to provide an optimistic view of the future and the way to get there by setting and achieving goals and objectives. Its main component is communication as the tool leaders use to inspire their followers (Dhammika et al., 2014)

#### 4.3.3 Intellectual stimulation

Intellectual stimulation deals with the ability of leaders to challenge their followers to think creatively and resolve difficult problems. It is an aspect of transformational leadership that taps into the logical and problem-solving ways of thinking of followers. This element of transformational leadership also has a relationship with learning and can stimulate learning within the leader's team of followers (Dhammika et al., 2014).

#### 4.3.4 Individual consideration

The last element of transformational leadership is that of individual consideration, and as the name would imply, it deals with the leaders' behaviour that enhances their followers' satisfaction. This is achieved by leaders paying attention to their followers' needs, assisting them to develop and grow and recognising their contribution to organisational performance (Dhammika et al., 2014)

According to Malik et al. (2017), individual consideration is a central element, along with effective communication, in transformational leadership that leads to an increase in areas such as organisational commitment and job satisfaction.

#### 4.3.5 Transformational leadership's relationship with important constructs

Transformational leadership has been correlated to several organisational elements such as employee learning, knowledge sharing and innovation, employee commitment and job satisfaction, employee productivity, organisational culture and performance and team effectiveness, to name a few (Choi et al., 2017; Dhammika et al., 2014; Ejere & Abasilim, 2013; Khan & Wan Ismail, 2017; Malik et al., 2017; Phong et al., 2018; Saravo et al., 2017; Sheshi & Kercini, 2017; Trmal et al., 2015; Vanebo et al., 2015). These correlations have been researched in several studies and help to provide an understanding of the effect of transformational leadership on organisations.

According to Vanebo et al. (2015), values-based leadership is also correlated closely with transformational leadership. In their study focusing on the police in Norway, they identified transformational leadership as a key element in driving a values-based culture within an organisation. Below are some of the key relationships that transformational leadership has with constructs identified in the literature (Choi et al., 2017).

##### 4.3.5.1 Organisational performance

Several studies have reviewed the effect of leadership on organisational performance (Choi et al., 2017; Ejere & Abasilim, 2013; Sheshi & Kercini, 2017). This correlation has been found to be significant and has resulted in the enhancement of organisational performance when transformational leadership principles are applied by leaders in an organisation. Transformational



and transactional leadership were found to be essential to enhance organisational performance (Choi et al., 2017).

#### *4.3.5.2 Transactional leadership*

Transactional leadership is based on rewards provided for the completion of tasks. This, combined with transformational leadership, has been demonstrated to enhance the performance of the leaders' followers and thereby enhance the organisation's performance. Transactional leadership reinforces behaviours that leaders want their followers to exhibit, whereas transformational leadership instils purpose and a shared vision of the future, thereby motivating the leaders' followers to perform through more innovative ways of doing things and increased effort (Choi et al., 2017).

When these two leadership styles are utilised in combination, they enable leaders to reinforce desired behaviours, as well as to motivate their staff by instilling in them a vision of the future and ensuring that they feel valued (Choi et al., 2017).

#### *4.3.5.3 Organisational learning and knowledge sharing*

For most organisations, the ability to gain and disperse knowledge amongst their workforce is one of the ways they gain a competitive advantage over their rivals. According to Khan and Wan Ismail (2017), transformational leadership is a means whereby organisations can enhance organisational learning and knowledge sharing among their workforce. Through the application of the transformational leadership elements of idealised influence, inspirational motivation, intellectual stimulation and individual consideration, in their study, Khan and Wan Ismail (2017) were able to correlate transformational leadership with an increase in organisational learning and knowledge sharing of employees.

Phong et al. (2018) also studied the impact of transformational leadership on knowledge management within an organisation and found that the management of knowledge was correlated with knowledge sharing. They further discussed how knowledge sharing had a direct impact on long-term organisational performance and its competitiveness. The four elements of transformational leadership were found to have a positive impact on knowledge sharing when employees felt they could trust their leader.

#### 4.3.6 Critical evaluation of transformational leadership

It is postulated that transformational leadership is one of the best suited leadership styles to moving an organisation towards its goals. It is a leadership style in which leaders take a genuine interest in their followers, create a shared and common vision of the future and intellectually stimulate and meet the needs of their followers (Choi et al., 2017). This is in stark contrast to other leadership styles where the focus appears to be purely on results and using monetary means of motivation to get results, with little or no attention paid to the employees' unique needs.

In reviewing transformational leadership, it emerged that one of its shortcomings is that despite its increased focus on employees and assisting them to meet their own goals, the main aim is still to achieve organisational objectives first and employee objectives second. Hence everything that the transformational leader appears to do is therefore aimed at achieving organisational goals, but in a more inclusive and employee-focused way. The result, however, could be staff who feel that their leader is not prioritising their needs and requirements, but rather those of the organisation.

The aim of this section on leadership is to define this theory and explore its key components. A definition of transformational leadership was provided at the beginning of this section and the key components of transformational leadership were identified in the literature and discussed.

A review of the literature indicated that there is a paucity of information on possible measures that can be used to evaluate leadership without the use of designed questionnaires or surveys, of which there are several. Most of the possible indicators of effective leadership that have been identified revolve around two key components, namely the leaders' observable behaviours and the elements they influence within an organisation. Since an HRIS typically is not used to measure behaviours without the use of designed questionnaires, performance ratings or 360-degree assessments, the most viable option of measuring whether or not a leader is effective, is to measure other possible elements they influence. These possible elements have been identified in the literature as job satisfaction, organisational commitment, and organisational learning (Malik et al., 2017; Phong et al., 2018; Khan & Wan Ismail, 2017; Trmal et al., 2015):

#### 4.4 Transactional leadership

When leadership first became a topic of research, it was initially subdivided into two distinct leadership types. The first type of leadership is transformational and the second transactional (Bass,

1985; Burns, 1978; Choi et al., 2017). Transformational leadership was discussed earlier in this chapter, and transactional leadership is now explored to provide a better understanding of this vital leadership type.

Transactional leadership is identified by the nature of the relationship between leaders and their followers in that their followers behave in accordance with the leaders' instructions owing to their belief that they will receive some form of reward. Transactional leadership is therefore categorised by three main components, namely contingent rewards and active and passive management by exception (Dhammika et al., 2014; Ejere & Abasilim, 2013; Saravo et al., 2017; Sheshi & Kercini, 2017).

#### 4.4.1 Transactional leadership elements

Contingent reward focuses on the contractual relationship between leaders and their followers where the former offer physical and psychological rewards to the latter based on the completion of the contracted objectives (Dhammika et al., 2014; Ejere & Abasilim, 2013). Active and passive management by exception relates to a leader's method of dealing with the meeting of required standards. The former deals with an active role in ensuring the standards are met and checking on followers' performance. The latter is when leaders only intervene when errors occur or performance standard deviations are brought to their attention (Dhammika et al., 2014).

#### 4.4.2 Influences of transactional leadership

Saravo et al. (2017) reviewed the Full Range Leadership Model in their study in the medical profession in an intervention designed to enhance transformational and transactional leadership. Their findings were that both leadership types improved after the intervention had been rolled out. They further identified transactional leadership as having the most significant influence on organisational performance.

The reasoning for these findings was hypothesised as being specific to the medical industry where it was thought that this type of leadership might have the greatest influence. The influence that transactional leadership has on organisational performance, however, was found to have a negative correlation (Sheshi & Kercini, 2017). In their study on the influence on different leadership styles in

SMEs in Albania, they found that transformational leadership had a positive influence on organisational performance, whereas transactional leadership had a negative influence.

Adding another dimension to the influence transformational and transactional leadership may have on organisational performance, in their study, Ejere and Absailim (2013) identified a combination of transformational and transactional leadership as the best way to improve organisational performance. Overall, it would therefore appear that transactional leadership may have a positive influence on organisational performance in certain contexts and potentially in certain cultures where there is a greater focus on goal achievement and the rewards accompanying such achievements.

#### 4.4.3 Critical evaluation of transactional leadership

As part of the initial classification of leadership, transactional leadership is important when understanding leadership theory and practice. The possible effect of this leadership type on an organisation and followers has been shown in the studies discussed in this section and has provided clarity on how this leadership type is implemented for maximum effect for both leaders and their followers.

The primary benefit of transactional leadership is that it is highly task and goal driven, and when implemented correctly, can lead to the achievement of required objectives by leaders and their followers. This is done by providing rewards to followers for demonstrating a desired behaviour and in achieving the required objectives. Followers are therefore primarily motivated by the type of reward they can obtain based on their actions (Dhammika et al., 2014).

It is postulated that the shortcoming of this type of leadership is that monetary and other rewards supplied to produce required behaviours are not always sufficient to motivate followers and only allow for partial altering of behaviour on the surface. It is suggested that they do not therefore appear to allow for meaningful and sustainable change, and in instances where external factors or issues become increasingly influential, followers are likely to fall back on previous behaviours.

Transactional leadership is thus a type of leadership that can be effective, but it does have limitations. It is best implemented in conjunction with other types of leadership, such as transformational leadership that provides for an increased focus on the followers and their needs. According to Choi et al. (2017), when used in combination with other types of leadership, transactional leadership can be used to produce significant organisational results.

In reviewing the key components of transactional leadership in the literature, the following were identified (Dhammika et al., 2014): (1) contingent rewards; (2) active management by exception; and (3) passive management by exception.

## 4.5 Ethical leadership

As the significance of leadership and its effect on organisations, their employees and performance has become clearer over the last few decades, different types and schools of thought on leadership have emerged. Ethical leadership is one such type and has been studied with increasing intensity over the last few years owing to its importance in assisting organisations achieve their goals and objectives ethically (Kwak & Shim, 2017; Lee, 2016; Mozumder, 2018; Munro & Thanem, 2018; Whang et al., 2018). To this end, the definition identified and repeated in several different studies on ethical leadership is cited below:

Ethical leadership is “[t]he demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct to followers through two-way communication, reinforcement, and decision making” (Brown et al., 2005, p. 120).

When reviewing the above definition, behaviour can be identified as the most crucial concept. Based on this key concept, ethical leaders are those who not only promote and communicate the correct way to act and complete tasks, but also exhibit this behaviour themselves and thereby influence their followers’ behaviour.

Based on the review of the literature, several key elements of ethical leadership are discussed in more detail to ensure that a sound understanding of this concept is provided in relation to the overall study. The elements, benefits of ethical leadership, how ethical leaders promote ethical behaviours, and ethics from a follower’s perspective, were chosen on account of their prevalence and identified importance in the literature (Choi et al., 2015).

### 4.5.1 The benefits of ethical leadership

For many leadership researchers and theorists, the number of case studies available today has increased dramatically over the last few decades and has provided a better understanding of what bad and unethical leadership can do to an organisation (Mozumder, 2018). The results of such

leadership practices were witnessed when some of the largest organisations in the world collapsed, resulting in enormous financial and other associated losses for the involved stakeholders.

For most organisations in this ever-changing world of work, the benefits of instilling ethical leadership at all levels provide vital competitive advantages, enabling them to realise their goals (Lee, 2016; Mozumder, 2018).

A review of the literature on ethical leadership reported a significant amount of evidence on the potential benefits that can be gained by instilling ethical leadership within an organisation, such as improved organisational citizenship behaviour and corporate social responsibility, enhance employee well-being and commitment, and enhance organisational performance (Kwak & Shim, 2017).

#### 4.5.2 Improved organisational citizenship behaviour and corporate social responsibility

Two concepts that have received attention over the last few years are organisational citizenship behaviour and corporate social responsibility. Both are influenced by ethical leadership, and when promoted effectively in an organisation, may lead to a range of benefits (Choi et al., 2015; Mozumder, 2018).

Two definitions of organisational citizenship behaviour that were identified in the literature and a definition of corporate social responsibility are provided below.

- Organisational citizenship behaviour has been defined as the extra-role, discretionary behaviour that helps other members in the organisation to perform their jobs. OCB also includes supporting and being conscientiousness in the organisation (Borman & Motowidlo 1993).
- Organisational citizenship behaviour is defined as “individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organisation” (Organ 1988, p. 4).
- Corporate social responsibility is defined as the social responsibility of business, and encompasses the economic, legal, ethical, and discretionary [later referred to as philanthropic] expectations that society has of organisations at a given point in time (Fordham & Robinson, 2018).

Mozumder (2018) reviewed ethical leadership, trust and the influence of ethical leadership on employees, as well as the organisation. Trust was defined in the study as a “psychological state

comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another” (Rousseau et al., 1998, p. 395). The goal was then to design a model that incorporated trust at multiple managerial levels within the organisation and ethical leadership. His findings provided evidence of a relationship between trust and ethical leadership in relation to benefits to the organisation, such as organisational citizenship behaviour and enhanced organisational performance.

In their study on ethical leadership and corporate social responsibility, Choi et al. (2015) identified a positive relationship between ethical leadership and followers’ perception of corporate social responsibility and that it was mediated by the organisation’s work climate. The benefit of increased corporate social responsibility in an organisation has been correlated to enhanced organisational performance in several studies, as reported by Choi et al. (2015).

According to Brown et al. (2005), the organisation’s work climate was identified as a mediator in the study, with a positive climate being the direct output of ethical leadership. Hence when leaders in the organisation promoted an ethical leadership style, employees learned to behave not only in a manner that assisted in profit making and helped the organisation achieve its objectives, but they also completed their work ethically. Once the ethical climate has been established, it positively influences not only the employees within the organisation but other stakeholders as well, such as suppliers and customers (Choi et al., 2015).

The only limitation of Choi et al.’s (2015) study was that it was conducted in the finance sector only in Korea, thus limiting the generalisability of its findings.

#### 4.5.3 Additional benefits of ethical leadership

As discussed in the section dealing with OCB and CSR, there are several additional benefits that can be derived from the promotion and implementation of ethical leadership. These benefits include but are not limited to enhanced employee wellbeing, enhanced employee commitment and improved organisational performance (Lee, 2016; Mozumder, 2018).

In their study on corporate social responsibility, Choi et al. (2015) discussed the relationship between organisational performance and ethical leadership, with one having a direct influence on the other owing to the effect that ethical leadership has on followers’ behaviours and how these, in turn, impact how the organisation performs. As ethical leadership becomes instilled in an organisation, employees begin to model the behaviours exhibited by their leaders, with the primary

focus on completing tasks and assignments ethically to achieve the required result. This is a critical shift from the mind set of achieving organisational objectives within the parameters of the law as the law does not always take ethics or morality into account.

During the process of developing a multilevel model on ethical leadership and trust, the key concept identified was that of trust between leaders and their followers (Mozumder, 2018). The impact that followers' trust in their leaders had regarding elements, such as organisational commitment and organisational performance, was significant. When followers perceive their leaders to be ethical and to act with integrity, they are more likely to trust them, which, in turn, leads to greater organisational commitment, and better attitudes towards their jobs and job performance (Shin et al., 2015)

Lee (2016), in his study on followers taking charge because of ethical leadership, also identified trust as a critical element in followers exhibiting additional behaviours that had a positive influence. Positive behaviours are those behaviours that are demonstrated that are above and beyond what employees are normally required to do in their role and are therefore crucial to any organisation hoping to gain a competitive advantage over its competitors.

#### 4.5.4 How ethical leaders promote ethical behaviour

In a review of the literature, it became clear that there are several ways in which ethical leaders can promote ethical behaviours among their followers. First is the importance of middle management in promoting ethical leadership within the organisation. Second is social exchange theory and third is social learning theory. These different methods are discussed below to provide a better understanding of the concepts (Kwak & Shim, 2017).

In a review of the literature on ethical leadership within an organisation, one finds that the focus is mainly on the organisation's top leadership, as they are often identified in the literature as having the greatest influence on the organisation's climate and culture. According to Whang et al. (2018), top leaders in the organisation do not, however, have the greatest influence on instilling and promoting ethical leadership in an organisation. In their study on the trickle-down of ethical leadership within an organisation they discovered that while top leaders play a key role in equipping and supporting their middle managers in behaving ethically, they were not the ones who were able to instil ethical behaviours most effectively in the wider organisation. The management level attributed with the ability ethical leadership principles appeared to be middle management.



The reason for this finding of Whang et al. (2018), is the concept of social learning theory and how it is applied by middle managers. Social learning theory holds that an individual learns by observing others and the way they behave. It has two key components, namely efficacy expectation and outcome expectation (Whang et al., 2018).

Efficacy expectation is “the belief that an individual has the necessary resources to execute ethical behaviour” (Mitchell & Palmer, 2010, p. 92). Outcome expectation is the belief an individual who has that ethical or unethical behaviour will lead to either a positive or negative outcome (Ashkanasy et al., 2006, p. 450).

Hence middle managers in the organisation are the ones who can exert the greatest influence over the behaviour of their employees because of their direct interaction with them and the control they have over rewards and punishments. Whang et al. (2018) found that outcome expectation was the principal determinant of ethical leadership in an organisation and had the greatest influence on employees’ behaviour. This was due to the expected outcome employees perceive will come from their ethical behaviour.

Social exchange theory, as discussed by Mozumder (2018), involves the concept of reciprocity whereby employees feel obligated to return ethical behaviours when leaders behave ethically in their interactions with them. This theory is largely based on norms and the culture that leaders help formulate for their staff by establishing what the acceptable way of behaving and acting is. Employees who therefore witness positive ethical behaviour on the part of their leaders will start to behave the same because they feel obligated to exhibit the same behaviours.

#### 4.5.5 Ethics from a follower’s perspective

Most of the literature reviewed on the topic of ethical leadership has been written almost exclusively from the perspective of the managerial levels within an organisation and how they instil and enforce ethical leadership. For Munro and Thanem (2018), the focus of their study was different and reviewed ethical leadership from the perspective of the followers within an organisation.

The two most noteworthy findings in their study were that leaders do not automatically have the best behaviours and traits merely because they are in positions of authority, and that followers do not automatically lack certain traits and behaviours because they are not in positions of leadership. Hence the main benefit of their article was that an ethical leadership model or approach designed purely from a leader perspective is dangerous and does not consider all the factors that influence

ethical behaviours in an organisation (Munro & Thanem, 2018). Future initiatives and models designed for ethical leadership should therefore consider the perspective and input of followers in the organisation in contributing to and instilling ethical leadership principles and behaviours.

#### 4.5.6 Critical evaluation of ethical leadership

Ethical leadership is one of the most recent types of leadership to emerge globally and has demonstrated the significance and value that it can add to organisations where it has been implemented. It is a leadership types that focuses on behaving ethically that goes above legislative and statutory requirements. By leaders instilling ethical leadership principles in their organisations, they are demonstrating to followers that it is not only about achieving desired results but also how these results are achieved (Choi et al., 2015).

One of the only limitations identified in the literature on ethical leadership is that most of the studies that have been conducted focus only on the effect and influence that leaders who behave or do not behave ethically have on their followers and the organisation. There is not enough of a focus on the followers' influence on ethical leadership and the traits and characteristics they possess (Munro & Thanem, 2018).

Owing to its focus on behaviour and the way goals should be attained, ethical leadership in combination with transformational leadership was deemed best suited to this study in representing a modern and successful organisation. To this end, ethical leadership is defined in this section, and the key components of two-way communication, trust between followers and their leaders, demonstration of ethical behaviour and decision making, and work climate, were identified in the literature (Choi et al., 2015).

As with transformational and transactional leadership, discussed earlier in this chapter, ethical leadership is predominantly measured by the behaviours that leaders exhibit, the actions that they take and the elements within the organisations that are influenced by such behaviour and actions. Because behavioural components are not typically measured by a standard HRIS, it was postulated that the best approach to evaluate whether ethical leadership is within an organisation would be to review the elements it influences.

The constructs that ethical leadership influences were therefore the focus of this study, and they were identified in the literature review as organisational citizenship behaviour and corporate social responsibility (Choi et al., 2015; Mozumder, 2018).

## 4.6 Additional leadership types

Some of the main types of leadership have been discussed in this chapter, and this section now explores other leadership types and theories identified in the literature, namely spiritual, benevolent, servant, African, and authentic leadership.

### 4.6.1 Spiritual leadership

“Spiritual leadership finds its roots in the field of workplace spirituality, a construct that is characterized by meaningful and interesting work, a sense of connection and positive social relations, and the ability to live an integrated life of aligned individual and organisational values” (Hunsaker, 2017, p. 487).

Spiritual leadership as a concept has also been correlated to other better-known types of leadership such as transformational and servant leadership. Its primary focus, which is evident in the above definition, is to provide meaning and connections for employees with their work (Hunsaker, 2017).

In his study on the relationship between spiritual leadership, and organisational citizenship behaviour and the mediating effect of self-determination, Hunsaker found that self-determination had a significant correlation with organisational citizenship behaviour, and that this was influenced by spiritual leadership. Instilling spiritual leadership in an organisation therefore promoted components associated with the leadership type such as a greater sense of autonomy for employees over their work, which then influences the behaviours among employees such as organisational citizenship behaviour. Hence this influence on organisational citizenship behaviour, in turn, has a significant impact on organisational performance (Hunsaker, 2017).

### 4.6.2 Benevolent leadership

Benevolent leadership refers to leaders’ demonstration of individualised, holistic concern for subordinates’ personal or familial well-being (Cheng et al., 2004).

Lin et al. (2018) investigated the relationship between benevolent leadership and employee creativity and cited several studies that supported the influence that benevolent leadership had on employee behaviours such as organisational citizenship behaviour, organisational commitment and

job satisfaction. The findings of the study indicated that when followers perceive their leader to act in a way that genuinely benefits them, they then behave in more positive ways and this in turn has a positive effect on the organisation's performance.

Benevolent leadership in principle is therefore similar to the theory of social exchange discussed earlier, whereby followers reciprocate behaviours that they perceive their leaders are manifesting. In the case of benevolent leadership, however, the difference is that it appears to be less about obligation and more about the genuinely positive behaviour of the leader and the followers' desire to act in the same way.

Lin et al. (2018) identified one other critical finding in their study regarding benevolent leadership and the effect it has on followers in the form of the cultural concept of power distance. They found that the greater the power distance between leader and follower, the more positive the follower perceives the leaders' actions to be, and the smaller the power distance, the less positive the follower perceived the leaders' actions to be.

#### 4.6.3 Servant leadership

Servant leadership is a leadership type, which despite receiving increased focus in the past 15 years, was initially discussed by Greenleaf back in 1970 and was at the time largely ignored. This leadership type did not gain much traction in the academic or business community until decades later when it was reviewed in another study (Spears, 2004).

Two definitions of servant leadership are provided below because they provide a greater understanding of this leadership type.

- Servant leaders, at their core, are those individuals who develop and empower others to reach their highest potential (Sendjaya & Sarros, 2002).
- Servant leadership is the leadership that places subordinates' interests as the top priority, and the interests of the organisation as the next priority (Hazrati, 2012).

It is clear from the above definitions that the central component that differentiates servant from transformational leadership is the priority placed on followers' needs. Servant leaders see the needs of their followers as their highest priority, whereas transformational leaders regard the needs of the organisation as their top priority, and their followers second.

According to Gandolfi and Stone (2017), there are ten elements associated with servant leadership, namely listening, empathy, healing, awareness, persuasion, conceptualisation, foresight,

stewardship, commitment to the growth of people and building community. Begzadeh and Nedaei (2017) identified four elements associated with servant leadership, that is, serving, reliability, humility and kindness.

The overarching theme identified in both authors' set of servant leadership elements is that leaders who serve their followers, are empathetic and kind and have a commitment to enhancing their followers, as well as placing their followers' needs above their own. It is posited that this leadership type has an increasingly more relevant place in today's modern corporate world where scandals have challenged the existing leadership models.

When one reviews the literature on servant leadership, several benefits can be identified from the successful implementation of this type of leadership in organisations. These benefits are as follows: organisational trust, employee autonomy, workforce engagement and organisational performance (Begzadeh et al., 2017; Gandolfi & Stone, 2017).

#### 4.6.4 African Leadership

As the African continent continues to grow and evolve, its contribution to the existing body of academic knowledge and research becomes increasingly important. In his study on African Leadership, Metz (2018) promoted a greater understanding of this theoretically developing concept that provides an alternative view to the main body of literature that focuses on Western and Asian leadership models.

According to Metz (2018), a sense of community and friendship appear to be particularly significant in the African leadership model that is described. Further information indicates that in African leadership, individuals are leaders because of people, and through people they can achieve objectives and goals. A notable similarity is highlighted in this regard between African and servant leadership (Metz, 2018).

#### 4.6.5 Authentic leadership

The last type of leadership identified in the literature that will be discussed briefly in this section is authentic leadership. The aim here is to provide a better understanding of this important type of leadership by defining it, discussing some of its core elements and then highlighting some of its benefits.

Authentic leadership can be defined as a type of leadership “which focuses on leaders being guided by sound moral convictions and acting in accordance with deeply held values” (Avolio et al., 2009; Gardner et al., 2011).

An analysis of the above definition indicates that authentic leadership is similar in nature to ethical leadership, with both types focusing on the way in which leaders act and the principles that guide them.

In their study, Wei et al. (2018) identified a positive relationship between authentic leadership and several positive employee behaviours. One of those behaviours was the intention to leave, which decreases because of authentic leadership principles being applied in an organisation. The above authors also cited several other studies and authors in identifying the core elements of authentic leadership. The core elements identified are self-awareness, balanced processing, internalised moral perspective and relational transparency (Ilies et al., 2005).

The benefits of authentic leadership that have been identified in the literature are enhanced follower job performance, greater organisational commitment, work engagement, reduced turnover intention and increased trust in leadership (Wei et al., 2018). Hence if leaders strive to instil this type of leadership in their organisations, there can be tangible results that could then enhance the organisation’s overall performance (Ilies et al., 2005; Wei et al., 2018).

#### 4.7 Measures of leadership

In this chapter, several types of leadership were discussed and reviewed in order to gain an in-depth understanding of this vital construct and its relationship with other key organisational components. The different types of leadership were analysed and the key components of the major leadership theories identified. The possible list of key components of each leadership type identified in the literature is provided in table 4.2.

**Table 4.2**

*Possible Measures of Leadership*

Transformational leadership	Key components	Source
	Job satisfaction	(Khan & Wan Ismail, 2017; Malik et al., 2017; Trmal et al., 2015)

	Organisational commitment	(Malik et al., 2017)
	Organisational learning	(Khan et al., 2017)
<b>Ethical leadership</b>	Organisational citizenship behaviour	(Mozumder, 2018)
	Corporate social responsibility	(Choi et al., 2015)
<b>Authentic leadership</b>	Enhanced employee performance	(Wei et al., 2018)
	Organisational commitment	(Wei et al., 2018)
	Work engagement	(Wei et al., 2018)
	Reduced turnover	(Wei et al., 2018)
	Increased trust	(Wei et al., 2018)
<b>Overall leadership influence</b>	Culture	(Khan & Wan Ismail, 2017; Hartnell et al., 2016; Meng & Berger, 2013; Stacho et al., 2017; Törnblom, 2017).

A combination of transformational, authentic and ethical leadership, and their elements, was identified as the most suitable for the current study. The primary reason for selecting these leadership types above others discussed in this section was the statistically significant influences they have on a range of constructs, such as job satisfaction and organisational commitment, as well as their focus on the achievement of goals through the enhancement of followers.

#### 4.8 Reflections and link to study objectives

The chapter on leadership was meant to identify the most important leadership types and their possible measures from a review of the literature and their relationship with organisation success. Once the review had been completed, specific types of leadership and their possible measures

linked to organisational were identified. The chapter provides a positive contribution to the study and its objectives of identifying leadership factors and their measures that could be used a means to assess organisational success by conceptualising the construct of Leadership and its key components from a theoretical perspective.

#### 4.9 Chapter summary

In this chapter, leadership as an OFS was reviewed and defined. The different influences of leadership were discussed. Several prominent types of leadership and approaches were then reviewed and explained. Each of the major leadership types were analysed in terms of strengths and weaknesses, and its key components were identified. A possible list of measures of the different types of leadership identified in the literature was also formulated. Reflections of the literature review conducted and the link to the study objectives was also discussed.

Chapter 5 provides a definition of organisational culture, and its various components are discussed, as identified in the literature. Its influence on organisational success is also highlighted, and existing models of organisational culture are then reviewed and discussed.



## Chapter 5: Organisational Culture

The topic of organisational culture has increased in importance from a business and academic perspective over the last several decades owing to the greater understanding of its significance by most academics and leaders in organisations (Alvesson, 2011). Organisational culture is a frequently researched topic because of the major influences it has been found to have on constructs such as job satisfaction, organisational commitment, organisational performance, innovation and employee productivity (Belac et al., 2017; Hazavehei et al., 2019; Kujala et al., 2016; Pucetaite et al., 2016; Stacho et al., 2017; Su et al., 2012; Szymanska, 2016).

The aim of this chapter is to provide a greater understanding of organisational culture, focusing specifically on establishing a working definition, the different influences it has, the different types of organisational culture, as identified in the literature, the theoretical framework, and the key elements of the concept.

In summing up the importance of organisational culture, Drucker (1954) once said that culture eats strategy for breakfast. The main principle to be drawn from this famous quotation is that while a great deal of effort can be made in adjusting and tweaking various elements of the organisation, including its strategy, if the culture is not conducive to meeting the required objectives, then projects and initiatives implemented to meet those objectives are likely to fail.

### 5.1 Defining organisational culture

It is essential for any discussion involving organisational culture to define the concept so as to ensure a common understanding of the material to be discussed. To this end, several definitions and statements are provided below that were identified in the literature as being the most relevant to the current study:

- Organisational culture is composed of shared values and norms that inform employees about how they should perceive, think, feel and behave in relation to organisational problems (Ostroff et al., 2013; Schein, 2010).
- Culture is defined as a combination of formal structures, systems and organisational practices and informal, unspoken, taken-for-granted assumptions, norms and behavioural modes that may go unreflected in organisational life (Schein, 1990; Trevino et al., 1998).

- Hofstede et al. (1990, p. 286) defined organisational/corporate culture as “(1) holistic, (2) historically determined, (3) related to anthropological concepts, (4) socially constructed, (5) soft, and (6) difficult to change”.
- Organisational culture comprises the fundamental values, assumptions and beliefs held in common by members of an organisation (Gjuraj, 2013; Lund, 2003; Ravasi & Schultz, 2006)

When the above definitions are reviewed, the key components identified are elements shared within the organisation and specific ways of behaving. The general term of shared elements is used to describe all those identifiable norms, beliefs, objects and understandings that employees in an organisation’s culture share. Behaving, however, focuses on the observable behaviour of leaders and other employees in the organisation that sets an example for others in terms of what is acceptable and what is not. The behavioural component is deemed to be the more important of the two constructs as it establishes norms and what is acceptable.

The definition of organisational culture regarded as best encapsulating its key elements is that it is a shared set of norms, understandings, values and behaviours that direct and guide employees on what is acceptable behaviour, ways of thinking and communicating within the organisation.

## 5.2 Organisational cultural influences

For many organisations that are constantly trying to keep up with and stay ahead of a changing world, gaining a competitive advantage over their rivals may mean the difference between being successful or not existing at all. Organisations are therefore always looking at ways of improving the delivery of their services and products to customers, enhancing internal processes and formulating and implementing new and innovative strategies. Organisational culture is one such element where a meaningful change can have far-reaching consequences for the organisation. In this section the main influences of organisational culture are discussed, as identified in the literature.

### 5.2.1 Innovation and enhanced organisational performance

Innovation and its relationship with organisational learning and knowledge management were dealt with earlier in chapter 3, specifically in sections 3.3.2.2 and 3.3.3.2 a). Organisational performance was discussed in chapters 3 and 4. In this section, the ability of organisational culture to influence these two key constructs that are essential to any modern organisation, is explored.

### 5.2.1.1 Innovation

The ability to innovate and design new products and services or enhance existing ones, as well as refine processes within an organisation, is critical in an ever-changing business landscape. To enhance employees' ability to innovate and be creative, many organisations have designed strategies and initiatives to provide them with support and enhance their skills. Organisational culture and the type of culture that exists within an organisation has been identified as one of the most critical mechanisms to achieve this aim (Belac et al., 2017; Min et al., 2016; Pucetaite et al., 2016; Szymanska, 2016).

In their study on leadership and creative tendency, Min et al. (2016) correlated leadership with establishing the environment required to promote creativity among employees and had the greatest effect on an organisation's culture, which in turn, then influenced behaviours such as employees' autonomy and their creative tendencies.

Organisational culture has been identified as having an influence on employee behaviour, such as innovation, with a significant finding being the ability of culture to enhance the sharing of values among employees (Pucetaite et al., 2016). Values like those embodied by an organisation with an ethical culture, such as honesty, fairness, integrity, respect and equality, not only drive innovation within an organisation, but also assist employees to identify with the organisation, as their values and those of the organisation are aligned (Pucetaite et al., 2016).

Many studies have focused on the effect of culture on an organisation, with several reviewing the effect on innovation and creativity, and the specific culture that is best suited to promoting these behaviours. Two studies conducted by Belac et al. (2017) and Szymanska (2016), in the study on culture and SMEs, identified a culture that is correlated with innovation and creativity.

The four cultural types reviewed by Belac et al. (2017) stem from the Competing Values Framework (CVF) developed by Cameron and Quinn (2006), are clan, adhocracy, market and hierarchy. A clan culture fosters a friendly work environment, a sense of family and an emphasis on teamwork and cooperation. Adhocracy fosters an entrepreneurial spirit and a creative business environment, and is fast paced with risk taking. Market culture is characterised as being competitive and focused on completion of tasks. Hierarchy, as the name would suggest, relates to structures, rules and procedures.

An adhocracy culture was identified by Belac et al. (2017) as being the culture with the closest relationship to innovation and creativity, while Disselkamp (2005, p. 67) identified a culture built on specific pillars. The pillars were professionalism, commitment, creativity, entrepreneurship and

innovativeness, competitiveness, the ability to quickly learn and acquire new skills, a willingness to take risks and bear the responsibility, flexibility in thinking and action, ambition, enthusiasm, fighting spirit, initiative and success, and the ability to predict the future, as being the best suited to innovation.

A comparison of the culture pillars with the adhocracy culture reveals several similarities, the most important being risk taking, being fast paced, flexibility and the entrepreneurial spirit. It therefore appears that when these elements exist in an organisation's culture, there is a greater likelihood of innovation and creativity occurring as employees are given space and have a conducive environment.

#### *5.2.1.2 Organisational performance*

Enhancing organisational performance is a goal that nearly every organisation shares, and many of the strategies, initiatives and projects that are designed and rolled out are aimed at realising this goal. Hence for an organisation attempting to enhance the way it operates and thereby obtain a competitive advantage over its rivals, fixing or improving its culture to meet new requirements is essential (Arikan & Enginoglu, 2016; Belac et al., 2017; Hartnell et al., 2016; Kujala et al., 2016; Oosthuizen & Fontannaz, 2007; Pucetaite et al., 2016; Raynor & Ahmed, 2013; Stacho et al., 2017; Su et al., 2012).

Organisations throughout the world have different types of cultures that depend on a variety of factors and can result in vastly different set of norms, behaviours and standards, which in turn, affect organisational performance. The purpose of this section is to explain the correlation between culture and organisational performance.

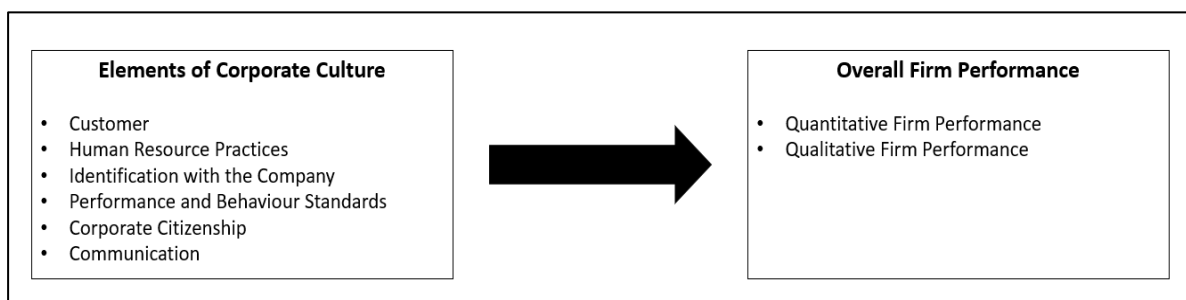
Hofstede (1980) is regarded by many as an expert on organisational culture and is one of the pioneers who has contributed much to the topic, identifying a set of criteria that could be used to classify an organisation's culture. In their study on the correlation between manufacturing strategy and culture in China, Su et al. (2012) utilised Hofstede's (1980) cultural elements to determine what the best culture would be to assist organisations employing efficiency and flexibility strategies to achieve their aims. Hofstede (1980) and Arikan and Enginoglu (2016) identified the following six elements of national culture: Power distance, individualism versus collectivism, masculine versus feminine, uncertainty avoidance, indulgence versus restraint and long- versus short-term orientation.

In their study, Su et al. (2012) utilised only three of the cultural elements identified by Hofstede, that is, power distance, individualism versus collectivism and uncertainty avoidance, as these had been researched in the manufacturing sector before. Organisations seeking greater flexibility, a culture characterised by collectivism, low power distance and high uncertainty avoidance were ideal for an organisation pursuing greater efficiency individualism, high power distance and low uncertainty avoidance (Su et al., 2012). The focus on the cultural elements identified assisted organisations to attain their goals and thus enhance their performance.

Arikan and Enginoglu (2016) built on Hofstede’s cultural elements and incorporated those of other authors such as Flamholtz and Kannan-Narasimhan (2005) and Alpay et al. (2008). The result was the development of a framework to study the relationship between the quantitative and qualitative performance of an organisation, as depicted in figure 5.1.

**Figure 5.1**

*Relationship between Corporate Culture and Overall Firm Performance*



*Note.* Relationship between Corporate Culture and Overall Firm Performance. From How elements of corporate culture affect overall firm performance, by Arikan & Enginoglu, 2016, *International Journal of Business Management and Economic Research*, 7(3), p. 683.

In their framework, Arikan and Enginoglu (2016) identified six elements of corporate culture, namely customer, human resource practices, identification with the company, performance and behaviour standards, corporate citizenship and communication. Their findings identified the critical importance of communication and its effect on organisational performance. Performance and behaviour standards were also found to be significant in relation to quantitative organisational performance. Belac et al. (2017) was also able to establish that when the various elements associated with the organisational culture are aligned with its strategy, then the organisation’s performance improves.

Hartnell et al. (2019) studied the influence of the clan types proposed in the CVF on organisational systems and its components. These components included leadership, strategy, structure, culture and high-performance work practices. The results concluded that the cultural types proposed by the CVF

had a direct influence on the other components of organisational systems and were able to distinctly influence organisational outcomes.

Ethical leadership, as discussed in the chapter on leadership, is becoming increasingly significant for organisations as they seek to formulate and instil an ethical culture that guides the way they work. An ethical culture has been shown to assist organisations in achieving their goals and objectives by creating a working environment and establishing work behaviours that promote productivity and therefore overall organisational performance (Kujala et al., 2016). According to them, trust is the key component in enhancing the way an organisation operates and performs. This key component stems from an ethical culture and the correct combination of trust and cognitive distrust that allows an environment to be created that supports organisational performance. Cognitive distrust allows employees in an organisation to voice their concerns, be more open with communication and express their fears (Kujala et al., 2016).

Alignment between an organisation's culture and its goals and objectives has been identified as crucial in the literature reviewed. Cultural elements such as employees' behaviour, and most importantly leaders' behaviours, the norms and performance standards established, are most often discussed (Stacho et al., 2017). Hartnell et al. (2016), in their study of similarity or dissimilarity of leadership and culture and the influence this has on organisational performance, found overwhelmingly that it is essential for a leader to provide the elements that are missing from an organisation's culture, for example, being a leader who focuses on relationships in a culture aimed at tasks. This is a major finding and centres on the principle that it is easier to change one's leadership style than to attempt to change an organisation's culture.

Adaptation for employees to the organisation's culture and its associated behaviours was also identified as being critical to ensure the achievement of goals and objectives (Stacho et al., 2017). The influence an employee's direct supervisor was found to have on the adaptation process was recognised as essential, and this needs to be done correctly to ensure that employees know what to do and how to help realise organisational goals and objectives (Stacho et al., 2017).

Not all the studies reviewed on the relationship between organisational culture and performance supported a positive relationship or the fact that culture had any influence on the performance of the organisation. In a study conducted on broadcasting companies in Indonesia on communication, culture and the relationship with employee motivation and organisational performance, the findings supported communication to enhance motivation and therefore organisational performance (So et al., 2018). The findings, however, did not support organisational culture as having an influence on motivation and organisational performance. This is a valuable study in that it indicates that where a

culture is not inhibiting or aligned with the organisation, it may therefore not have as much of an influence as it neither hinders nor helps its performance.

In summary, this section was able to establish a relationship between organisational culture, innovations and performance by ensuring alignment of cultural elements with the organisation's overall strategy and objectives. Establishing norms and performance standards, and instilling behaviours through sound leadership was identified as the best means to promote innovation and enable the organisation to achieve its goals.

### 5.2.2 Reward preferences

As organisations seek the means to attract and retain key staff in realising their goals and objectives, an effective and flexible rewards approach is crucial (Bussin et al., 2016). In their study, they identified the following five elements for occupational culture that were derived from the cultural dimensions identified by Hofstede (1980): (1) power relates to Hofstede's dimension of power distance; (2) risk considers the degree to which taking risks is accepted and encouraged among members of the occupational group; (3) time refers to the long-term focus of the occupational group; (4) gender relates to Hofstede's dimension of masculinity and femininity; and (5) team relates to Hofstede's dimension of individual versus collectivism.

A relationship was established in the study between occupational cultural dimensions and the following: gender, environmental preference, time and team and reward scale items, performance and recognition, career development work hours, family-related benefits, incentives, team pay and team equal.

The study's principal contribution was to highlight the importance of occupational culture as a subcultural element. For organisations this means not only focusing on overall culture but also addressing the culture of specific occupational groups and tailoring rewards structures accordingly.

### 5.2.3 Leadership

Of the several influences leaders may have in an organisation, their influence on organisational culture is by far the most important (Hartnell et al., 2016; Khan & Wan Ismail, 2017; Meng & Berger, 2013; Stacho et al., 2017; Törnblom, 2017). An organisation's culture is the common understanding

that employees share about how things are done, how people behave, what is right and wrong and the rules and norms that govern behaviour. Leaders significantly influence the elements for better or worse in an organisation.

The relationship between leadership and culture is well researched in the literature, with the former having a vital impact on the latter, more so than any other element. It is therefore essential in reviewing culture that leadership and its influence on an organisation are explored and understood (Hartnell et al., 2016). Mash et al. (2016) conducted research on how to change organisational culture, specifically in a South African context, and found that changing leadership style had the most significant effect on organisational culture. The relationship between organisational culture and leadership was further supported when reviewing the work of Khan and Wan Ismail (2017), which found that transformational leadership had a relationship with organisational culture.

### 5.3 Types of organisational culture models and their key elements

Over several decades, organisational culture has emerged as a critical area of study owing to its established importance in relation to how an organisation operates and achieves its goals. This section focuses on authors and their cultural types, as identified in the literature, namely Hofstede, Schein, Deal and Kennedy, Martins, and Cameron and Quinn.

#### 5.3.1 Hofstede

Hofstede (1980) and his model on national culture was explained earlier in this chapter. The aim here is to briefly discuss his national cultural elements in conjunction with other authors to establish a list of cultural types and their key elements.

Hofstede is still important to the field of organisational culture as his model and at least one of his elements is still being used as the basis for most studies on organisational culture (Bos et al., 2011). Hofstede (1980) divided organisational culture into the following factors: (1) power distance; (2) uncertainty avoidance; (3) individualism/collectivism; (4) masculinity/femininity; and (5) short-/long-term orientation. These factors help to categorise organisational cultures and provide a better understanding of how they function in different countries around the world.

In reviewing Hofstede's model, its contribution to our current understanding of organisational culture cannot be overestimated and continues to shape a large portion of the research into this



complex and dynamic construct. Its strengths are a means whereby culture can be classified using easily understood critical elements dealing with acceptable behaviours, goal focus, the organisation's structure and working as a team or individually. It is suggested that the weaknesses of Hofstede's model are that there is no focus on the contribution that employees make to an organisation's culture either through adhering to the norms established or by choosing to join an organisation because of the match between it and employees' values. The concept of ethics also does not feature in the model, and this has become critical to any modern organisation and the way it does business (Kwak & Shim, 2017). More recent research from a South African and international perspective has been conducted on ethics culture, and it offers several ways to measure it (Robbins et al., 2016).

### 5.3.2 Schein

Schein's (1990) model deals with three distinct elements of culture, namely artefacts, espoused values and basic underlying assumptions. Artefacts are what an individual sees and can feel inside an organisation, and include everything that someone is able to use their senses to identify. Espoused values are the foundations the organisation provides for behaviour as they drive these elements within their environment, and underlying assumptions are the everyday elements of the organisation that most people take for granted.

Schein (1990) is another author who has made a significant contribution to culture and the three distinct elements he classified culture with continue to inform research into this construct. The concept of shared values being the foundation of culture in an organisation is a major strength of this model, as it speaks to values that are communicated within the organisation and the values that employees themselves have that may thus help them identify with the overall organisation. The model covers a wide range of cultural elements and simply articulates how these can be categorised in an organisation. The weakness of the model is that there is no focus on ethics and how this can and should shape an organisation's culture. Recent research by Robbins et al. (2016) discusses ethical culture and provides several ways in which it can be measured.

### 5.3.3 Deal and Kennedy

Deal and Kennedy (1982) explored several traits that could be identified in an organisation's

cultures. Their focus was on the strength traits of an organisation's culture, and they subdivided organisational culture into the following six critical elements: (1) history is conceptualised as a shared narrative of the past; (2) as far as values and beliefs are concerned, cultural identity is formed around the shared beliefs of what is important the values that determine what the organisation stands for; (3) rituals and ceremonies are the things that employees do every day that bring them together; (4) corporate stories exemplify company values and capture the exploits of employees to personify these values in action. Stories allow employees to learn what is expected of them and better understand what the business stands for; (5) heroic figures are employees and managers whose status is elevated because they embody organisational values. These heroes serve as role models and their words and actions signal the ideal to aspire to; and (6) the cultural network is the informal network in an organisation where often the most important information is learnt.

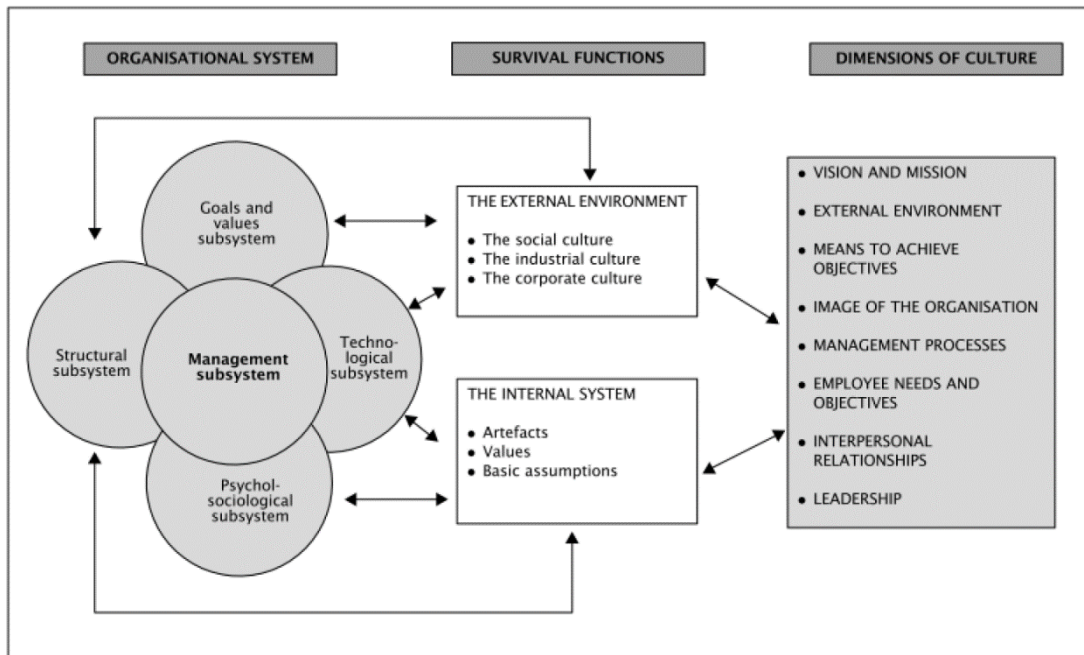
When analysing Deal and Kennedy's (1982) model, the key strengths that emerge are the importance of organisational history, the cultural network and heroic figures. These appear unique compared to other models of culture identified in the literature. Like the other models discussed, a weakness of this model is the lack of focus on ethics and how this informs the way in which an organisation functions, starting with ethical leadership and then resulting in ethical values and behaviours. Robbins et al. (2016) more recently conducted research that included ethical culture and that fact that it is an outcome of several factors that can be measured using several models they identified.

#### 5.3.4 Martins

Martins (2014) formulated a model of culture which, among several differences from other major models, included the influence of external factors. Figure 5.2 is a graphical depiction of Martins' model.

#### **Figure 5.2**

Martins' Model of Organisational Culture



*Note.* Martins' Model of Organisational Culture. From Macroeconomic processes and regional economies management by Martins, 2014, *Problems and perspectives in management*, 12(4), p. 244.

The model introduces several subsystems within an organisation that influence and are influenced by what is deemed “survival functions”, which are divided into the external environment and the internal system. These functions, in turn, influence and are influenced by the dimension identified of organisational culture.

The model’s major strengths are the focus on the influence of the external environment and the way in which the various elements identified influence each other. No element is therefore in isolation. A weakness of the model is the lack of ethical focus and how this, in turn, influences values and behaviour. Ethical culture, however, as discussed earlier in this section, was researched by Robbins et al. (2016), and offers models that can help to measure the construct with a focus on South Africa and other countries around the world.

### 5.3.5 Cameron and Quinn

Cameron and Quinn (2006), also discussed earlier in this chapter, are best known for their work on the competing values framework that derived four major types of organisational cultures, namely clan, adhocracy, market, and hierarchy.

When reviewing the cultural classifications identified by Cameron and Quinn, the first major strength is the generalisability of the classifications to cover most forms of organisational culture. The second is the extensive list of associated elements they identified for each of the cultural classifications. A weakness of the model is that it does not discuss ethics and the influence this has on culture. Another shortcoming is that the influence of the external environment on organisational culture is not discussed. More recent research by Robbins et al. (2016) provided models that can measure ethical culture as the outcome of several factors highlighting both South African and international research.

### 5.3.6 Summary of cultural models

When analysing the different models of organisational culture, the highlights are that there are several ways that culture can be explained and understood. In the above models, the elements of leadership, shared beliefs and values, standards of performance and behaviour, communication, external environmental factors, collaboration and teamwork, and organisational history were identified as being critical to organisational culture.

## 5.4 Measures of organisational culture

Organisational culture was reviewed and discussed in this chapter, as well as some of the constructs it influences. These constructs were, in turn, used to compile a possible list of measures that can be used to provide an indication of the health of the organisation using an organisation’s HRIS. A list of these possible measures, as identified in the literature, is provided in table 5.1.

**Table 5.1**

*Possible Measures of Organisational Culture*

	Key components	Source
Organisational culture	Job satisfaction	(El Din & El Ghetany, 2015; Malik et al., 2017; Trmal et al., 2015; Yap Peng Lok et al., 2019)
	Organisational commitment	(El Din & El Ghetany, 2015; Malik et al., 2017; Trmal et

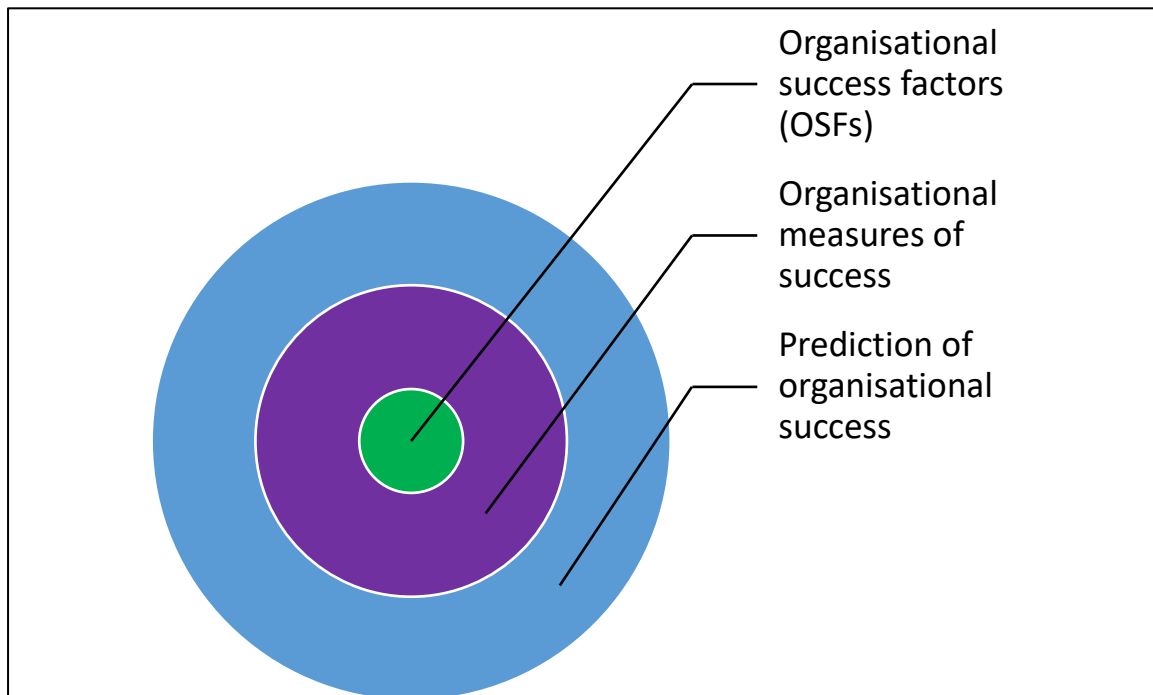
		al., 2015; Yap Peng Lok et al., 2019)
	Innovation	(Belac et al., 2017; Min et al., 2016; Pucetaite et al., 2016; Szymanska, 2016)
	Technological subsystems	(Martins, 2014; Kekwaletswe & Ncube, 2018)
	Rewards preferences	(Bussin et al., 2016)
	Competing values framework types	(Belac et al., 2017; Hartnell et al., 2019)
	Leadership	(Deloitte, 2018; Hartnell et al., 2016; Khan & Wan Ismail, 2017; Mash et al., 2016; Meng & Berger, 2013; Stacho et al., 2017; Törnblom, 2017).

The above measures, as with those identified under leadership, are not typically stored on an organisation's HRIS, except for the technological subsystems identified by Martins (2014) and Kekwaletswe and Ncube (2018). However, the main constructs identified that are influenced by an organisation's culture do have possible measures that can be used to provide an indication of their presence within an organisation, one example being job satisfaction. This is how culture is measured, that is, measuring the presence of the constructs it influences and determining an overall indication of the state of culture within the organisation.

## 5.5 Conceptual model

Based on the literature review conducted in chapters 2, 3, 4 and this chapter, a conceptual model was created that identified the key components. This model has been discussed in greater detail in this chapter. A high-level conceptual design of the model is provided in figure 5.3. The aim is to indicate how the model was designed to provide an indication of organisational success.

**Figure 5.3**  
*Conceptual Model*



## 5.6 Measures for organisational success factors

From the conceptual model developed, a list of possible measures of the OSFs was proposed, which the researcher deemed could be evaluated using data drawn from an HRIS. The list is contained in table 5.2.

**Table 5.2**

*Conceptual Model of Organisational Success Factors and their Possible Measures from an HRIS*

Organisational success factors	Measures	Sources
	Length of service	(Janićijević et al., 2018; Ok & Park, 2018; Riza et al., 2018)
	Voluntary turnover	(Abelha et al., 2018; Bakotić, 2016; Koh et al., 2017; Ok & Park, 2018; Yap Peng Lok et al., 2019)
	Age	(Janićijević et al., 2018; Riza et al., 2018; Sánchez-Sellero & Sánchez-

Job satisfaction and organisational commitment		Sellero, 2017; Tasios & Giannouli, 2017; Yap Peng Lok et al., 2019)
	Pay	(Janićijević et al., 2018; Končar & Marić, 2015; Mabaso & Dlamini, 2018; Riza et al., 2018; Sánchez-Sellero & Sánchez-Sellero, 2017; Schwendimann et al., 2016; Tasios & Giannouli, 2017)
	Absenteeism	(Abelha et al., 2018; Roberts & Savage, 1973; Schwendimann et al., 2016)
	Gender	(Abelha et al., 2018; Roberts & Savage, 1973; Sánchez-Sellero & Sánchez-Sellero, 2017; Yap Peng Lok et al., 2019)
Learning and knowledge management	Technology used to support knowledge management	(Cao et al., 2013; Choe, 2016; Dermol, 2013; Jaaron & Backhouse, 2017; Leufvén et al., 2015; Mac & Evangelista, 2017; Rašul et al., 2012; Tohidi et al., 2012)
	Elements for a good KM system	(Goodhue & Thompson, 1995)
	CPD activities	(Puteh, 2017)
Business process	CMM maturity levels criteria	(Kalinowski, 2016)
	Processes mapped	(Akpoviro et al., 2019)
	Process-oriented organisational structure and improvement focused	(Leyer et al., 2017)
	Job satisfaction and organisational commitment	(El Din & El Ghetany, 2015; Malik et al., 2017; Trmal et al., 2015; Yap Peng Lok et al., 2019)

Organisational culture	Innovation	(Belac et al., 2017; Min et al., 2016; Pucetaite et al., 2016; Szymanska, 2016)
	Technological subsystems	(Kekwaletswe & Ncube, 2018; Martins, 2014)
	Reward preferences	(Bussin et al., 2016)
	Competing values framework types	(Belac et al., 2017; Hartnell et al., 2019)
	Leadership	(Deloitte, 2018; Hartnell et al., 2016; Khan & Wan Ismail, 2017; Mash et al., 2016; Meng & Berger, 2013; Stacho et al., 2017; Törnblom, 2017).
Transformational leadership	Job satisfaction	(Khan & Wan Ismail, 2017; Malik et al., 2017; Trmal et al., 2015)
	Organisational commitment	(Malik et al., 2017)
	Organisational learning	(Khan & Wan Ismail, 2017)
Ethical leadership	Organisational citizenship behaviour	(Mozumder, 2018)
	Corporate social responsibility	(Choi et al., 2015)
Authentic leadership	Enhanced employee performance	(Wei et al., 2018)
	Organisational commitment	(Wei et al., 2018)
	Work engagement	(Wei et al., 2018)
	Reduced turnover	(Wei et al., 2018)
	Increased trust	(Wei et al., 2018)



Overall leadership influence	Culture	(Hartnell et al., 2016; Khan & Wan Ismail, 2017; Meng & Berger, 2013; Stacho et al., 2017; Törnblom, 2017).
HRIS	The organisation has an HRIS	(Berger, 2014)
	Usage of the HRIS	(Berger, 2014)
	Reduction in administration levels with an HRIS	(Ankrah & Sokro, 2012; Siengthai & Udomphol, 2016).
	Storing of information on the HRIS	(Qaisar et al., 2018)
	Reporting and analysis conducted using an HRIS	(Anitha & Aruna, 2013; Du Plessis & De Wet Fourie, 2016; Jones, 2016; Qaisar et al., 2018).

## 5.7 Reflections and link to study objectives

The literature review conducted in this chapter provided an overview of organisational culture, its existing models, and provide a list of organisational its possible measures. Based on the literature review it has been concluded the organisational culture is linked to organisational success and a list of possible measures could be identified. The chapter provides a positive contribution to the study and its objectives of identifying factors and their measures that could be used a means to assess organisational success by conceptualising the construct of organisational culture and its key components from a theoretical perspective.

## 5.8 Chapter summary

In this chapter, culture as an organisational success factor was reviewed and defined. The different influences that culture has were discussed. Several prominent types of culture models and tools and approaches were then reviewed and explained. An overall summary of the cultural models discussed was provided that highlighted the main elements extracted. A list of possible measures for organisational culture as derived from the literature was also proposed. The conceptual model was

then developed on the basis of the literature review of the organisational success factors and their possible measures. Reflections of the literature review conducted and the link to the study objectives was also discussed.

Chapter 6 explains the research method adopted for the study. This is then used as the basis for reporting and interpreting the results in chapter 7 for the qualitative phase and chapter 8 for the quantitative phase of the research.

## Chapter 6: Data Collection and Analysis Research: Empirical Study

In this chapter, the phases relating to data collection and analysis are introduced. The first is the qualitative study, and the second the quantitative study. The study aims, population and sample, the data collection methods and the methods employed to analyse the data are discussed.

### 6.1 Introduction

The research focused on the use of HRISs in providing an indication of organisational success based on the review of data extracted for the identified possible organisational success factors (OSFs) and their measures. These possible OSFs and their measures were discussed in detail in chapters 2, 3, 4 and 5, with the conceptual model that was designed also explained in chapter 5.

The study was conducted virtually in an organisation in the automotive and mining industries by interviewing subject matter experts in the Human Capital and Operational Excellence Departments on the conceptual model developed and using an online survey to empirically test the model that was developed with individuals in the same departments.

### 6.2 Aim of the study

The main aim of this research was divided into two distinct parts. The first was to develop a conceptual model of possible OSFs and their possible measures that could be extracted from an organisation's HRIS and review the model with subject matter experts in order to refine and enhance it. The second was to review and empirically test the model developed with subject matter experts and with the use of a survey and statistical analysis. A conceptual model was created from a review of the literature, refined with the qualitative analysis, and then reviewed and tested using a mixed-methods approach.

## 6.3 Mixed-methods research

A mixed-methods approach was selected because it was deemed to be best suited to the aim and objectives of the study. The reasoning behind the choice of this approach is discussed in this chapter before the results of the two data collection and analysis phases of the research are explained.

### 6.3.1 Defining mixed-methods research

Several definitions are provided below, based on a review of the literature on this type of research.

- Creswell and Plano Clark (2007) defined mixed-methods research as an approach to inquiry that combines or associates both qualitative and quantitative forms. It involves philosophical assumptions, the use of qualitative and quantitative approaches and the mixing of both approaches in a study.
- McKim (2017, p. 203) defined mixed-methods research as follows: It is “the integration of quantitative and qualitative research approaches in a single investigation in such a way that it provides the researcher with the opportunity to gain a deeper, broader understanding of the phenomenon than studies that do not utilize both a quantitative and qualitative approach”.
- Another definition of mixed methods research is “the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches for the broad purposes of breadth and depth of understanding and collaboration” (Johnson et al., 2007, p. 123)

A review of the above definitions indicates that they have one concept in common, specifically the use of both quantitative and qualitative forms of research and their elements to gain an in-depth understanding. This is a critical component of mixed-methods research and the benefits it adds to research. For the purposes of this study, Creswell and Plano Clark’s (2007) was adopted.

Three key components of the definition merit further discussion. These are use of both forms of research, the combination of both approaches and the mixing of both approaches in the research (Creswell, 2009; 2014; Hair et al., 2019).

The use of both forms of research, quantitative and qualitative, is the first element and includes conducting the research utilising both quantitative and qualitative research processes, methods and techniques to gather and analyse data (Creswell, 2009; 2014; Creswell & Plano Clark, 2011; Ivankova & Plano Clark, 2018; Tashakkori & Teddlie, 2010). A key component of the use of both forms of

research is the use of different data types collected. Mixed-methods research looks at both numerical and narrative data, whereas quantitative research usually involves the collection and analysis of numerical data, and qualitative research usually focuses on narrative data (Mukherejee & Kamarulzaman, 2016).

The combination of approaches in a single study is the second element. This element entails the use of both quantitative and qualitative research methods at specific stages of the study, with the timing of each phase dependent upon the overall objectives (Creswell, 2009; 2014; Tashakkori & Teddlie, 2010; Teddlie & Tashakorri, 2009)

The mixing of both approaches is the third element in Creswell and Plano Clark's (2007) definition. In this phase of mixed-methods research, the researcher mixes the results and findings from the quantitative and qualitative phases of the research into a coherent whole or two separate sets that maximises the strengths of the different types of research conducted and minimises their weaknesses (Cook et al., 2019; Creswell, 2009; 2014; Creswell & Plano Clark, 2011; Fetters & Freshwater, 2015; Ivankova & Plano Clark, 2018; Onwuegbuzie & Teddlie, 2003; Tashakkori & Teddlie, 2010).

In mixed-methods research, there are several options in terms of the worldview that can be used. The pragmatic approach was the paradigm chosen for this study and is a specific worldview that concentrates on the effects of actions and related situations, with the focus on finding a solution to a problem and what can be used in that pursuit thereof. The principles underlying pragmatism are as follows: (1) Pragmatism is not committed to any one research philosophy or system and therefore uses elements from both qualitative and quantitative research; (2) The researcher has freedom of choice in terms of techniques and methods and procedures; (3) Pragmatists do not see the world as an absolute unity; (4) Truth is what works at the time; (5) The pragmatist researchers look to the what and how to research, based on the intended consequences – where they want to go with it; (6) Pragmatists agree that research always occurs in social, historical, political and other contexts; and (7) Pragmatists believe in an external world independent of the mind as well as that lodged in the mind (Creswell, 2009; Venkatesh et al., 2013).

Based on the overall definition and underlying principles of pragmatism, it was believed to be the best suited paradigm for the study. This is primarily due to the nature of the study conducted whereby a combination of qualitative and quantitative elements, techniques, methods and procedures was needed to create the model, as well as freedom to use what was deemed necessary to complete the study.

### 6.3.2 Rationale for employing mixed methods

In the current study, mixed-methods research was deemed the best way to refine and then test the model created. In this section, the logic and rationale for using this type of research are discussed in greater detail.

Before any specific design for mixed methods is chosen, Creswell (2009; 2014) and Creswell and Plano Clark (2011) proposed four key elements that need to be taken into consideration, namely timing, weighting, mixing and theorising. Timing relates to when the data is collected and classified as being either concurrent or sequential, which depends on the aims of the research and what the researcher is trying to achieve. Weighting refers to the priority given to the data collected during each phase, and this may be equal or unequal. Mixing of the data describes the process whereby data gathered from each phase of the research is mixed at a chosen point in the research and is described under the three categories, namely connected, integrating and embedding. Connected involves the data being linked by data analysis in the first phase and data collection in the second phase. Integrating refers to the process whereby the qualitative and quantitative databases are merged. Embedding entails a researcher collecting data (e.g. qualitative) during a specific phase, and then utilising another source of data to provide support. Theorising is the last element to be considered when deciding on a mixed-methods design and looks at the larger theoretical framework that could be guiding the research (Creswell, 2009; Creswell & Plano Clark, 2011)

In mixed-methods research, Creswell and Plano Clark (2011) described two broad categories in which research falls specifically, namely typology and dynamic. Typology deals with the selection of the specific design for the research and the questions asked, whereas dynamic focuses on the design process and the multiple components of the research design from typology (Creswell & Plano Clark, 2011).

Mixed methods have five broad purposes that have been categorised and need to be considered by the researcher before adopting this type of design. These are triangulation, embedded, sequential, initiation and expansion (Baran, 2016; Creswell, 2009; 2014; Creswell & Plano Clark, 2011; Gray, 2009). Triangulation involves the convergence, correspondence and corroboration of results from different research types. Embedded focuses on the elaboration or enhancement of one method's results with the results from a different method. Sequential uses the results from one method to inform another method. Initiation's primary focus is on seeking paradoxes or contradictions. Expansion looks at extending the inquiry using different methods with different elements (Baran, 2016).

The mixed-methods approach as a research design is becoming increasingly popular because of its perceived benefits to the overall research and the researcher (Collins et al., 2006; Creswell, 2009; 2014; Creswell & Plano Clark, 2011; Fetters & Freshwater, 2015; Onwuegbuzie, 2017) The different benefits associated with mixed-methods research are discussed in greater detail below.

According to Fetters and Freshwater (2015), a formula was proposed of  $1 + 1 = 3$  to describe the benefits of conducting mixed-methods research with a quantitative and qualitative phase. The formula was designed to indicate that the sum of mixed-methods research is greater than the individual parts. This approach to the benefit of this type of research, however, was challenged by Onwuegbuzie (2017), who argued that the formula  $1 + 1 = 1$  was a better indication of the mixed methods-research process whereby the integration of quantitative and qualitative data resulted in a new whole.

Mixed-methods research affords the researcher the opportunity to make use of different research types and their elements. Advantages or benefits proposed by Teddlie and Tashakkori (2003, 2009) for this type of research are its ability to address questions of an exploratory and confirmatory nature at the same time. The second is its ability to provide stronger conclusions or inferences than using one method. The final benefit is the ability to provide a greater arrangement of divergent or complementary views (Teddlie & Tashakkori, 2003; 2009).

Other reasons for utilising the mixed-methods design proposed by Collins et al. (2006) are participant enrichment, instrument fidelity, treatment integrity and significance enhancement. Participant enrichment looks at improving the sample for research. Instrument fidelity utilises the mixed-methods research approach to review how appropriate an instrument is with a pilot study, the main aim being to enhance it or determine how suitable it is. Treatment integrity involves utilising mixed methods to determine the accuracy of treatments or interventions. Significance enhancement focuses on making use of both statistical analysis and story-related data that improves our understanding of the research or how we interpret it (Collins et al., 2006).

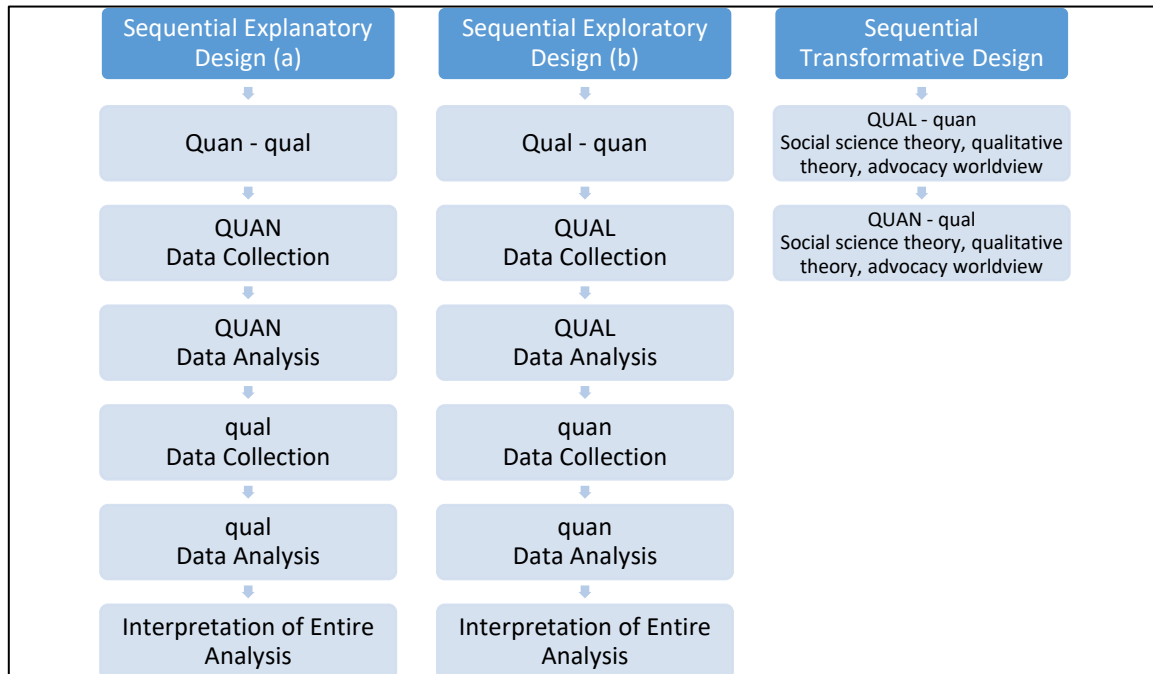
### 6.3.3 Mixed-methods design

Several mixed-methods designs have been discussed and proposed in the literature (Cook et al., 2019; Creswell, 2009; 2014; Creswell & Clark, 2007; Mukherejee & Kamarulzaman, 2016; Tashakkori & Teddlie, 2010; Teddlie & Tashakorri, 2009; Venkatesh et al., 2013). According to Creswell (2009), there are two major types of mixed-method designs, namely sequential and concurrent, whereas Creswell and Clark (2007) proposed four categories, specifically triangulation, embedded,

explanatory and exploratory. For the purposes of this research, the categories as proposed by Creswell (2009; 2014), in figures 6.1 and 6.2, and by Venkatesh et al. (2013), were used.

**Figure 6.1**

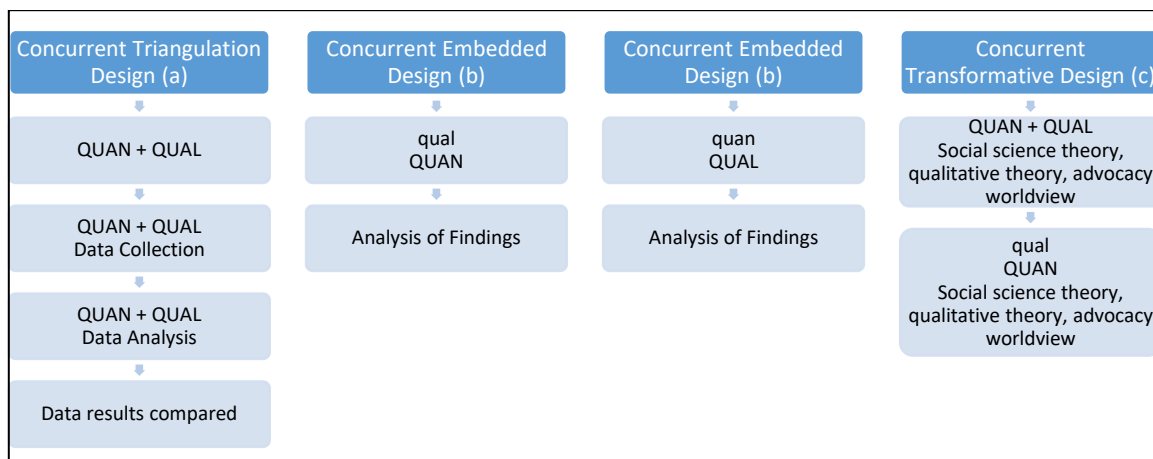
*Sequential Designs*



*Note.* The Different Types of Sequential Designs for Mixed-methods Research. From *Research design qualitative quantitative and mixed methods* (3<sup>rd</sup> ed.) (p. 209), by Creswell, 2009, Sage.

**Figure 6.2**

*Concurrent Designs*



*Note.* The Different Types of Concurrent Designs for Mixed-methods Research. From *Research design qualitative quantitative and mixed methods* (3<sup>rd</sup> ed.) (p. 210), by Creswell, 2009, Sage.



The two broad categories proposed by Creswell (2009; 2014; Saunders et al., 2007) are further subdivided into specific designs, namely sequential explanatory, sequential exploratory, sequential transformative, concurrent triangulation, concurrent embedded and concurrent transformative.

Sequential explanatory is a design that focuses on the collection and analysis of quantitative data first, followed by the qualitative data collection and analysis. The second qualitative phase of the research builds on the first quantitative phase with the weight being focused on the quantitative phase that informs the qualitative data collection (Baran, 2016; Creswell, 2009; 2014; Creswell & Clark, 2007; Tashakkori & Teddlie, 2010; Teddlie & Tashakorri, 2009).

Sequential exploratory has the reverse focus of the sequential explanatory design with the weighting being on the qualitative phase of data collection and analysis. In this strategy the qualitative data are collected and analysed first, followed by a quantitative phase that is informed by and builds on the qualitative phase (Baran, 2016).

Sequential transformative is a strategy that involves two distinct phases of the research with a theoretical lens. The researcher can decide which phase to start with before moving on to the second phase. The researcher can allocate the weighting equally between the different phases of the research or to a specific phase, as with other types of sequential mixed-methods research. The lens is the critical element that differentiates this strategy from others (Baran, 2016).

In concurrent triangulation, the researcher collects data for both the qualitative and quantitative phases of the research at the same time. Once collected, the two sets of data are then compared to determine if there are any similarities, differences or overlaps. The weighting of the phases in this type of mixed-methods research is often equal, but preference may be given to one phase over another. The data in the study was mixed and is discussed in the findings (Creswell, 2009; 2014; Creswell & Clark, 2007; Tashakkori & Teddlie, 2010; Teddlie & Tashakorri, 2009)

Concurrent embedded involves the collection of data for both quantitative and qualitative data in one phase at the same time. In this design, a primary method is used to drive the study with a secondary set of data providing support. The secondary method used in this design is then embedded in the first or primary method and may address different research aims or gather different information. The data is also not necessarily mixed but may be left alone to provide a different perspective (Creswell, 2009; Tashakkori & Teddlie, 2010; Teddlie & Tashakorri, 2009).

Concurrent transformative is similar in nature to the sequential transformative design in that it uses a specific theoretical perspective for the research. Data in this design is also collected concurrently. This design may have elements of both concurrent embedded and triangulation in answering the research questions. Data are merged using one of several different methods in the concurrent

methods suite, as chosen by the researcher (Creswell, 2009; 2014; Tashakkori & Teddlie, 2010; Teddlie & Tashakorri, 2009).

A sequential exploratory mixed-methods strategy was adopted in this study whereby qualitative data was collected in the form of semi-structured interviews from participants and then analysed. This was followed by the quantitative data collection and analysis phase of the research.

## 6.4 The conceptual model

The conceptual model that formed the basis of the qualitative phase of the research was discussed in chapter 5. A model and a table of the details were discussed, and then used for the qualitative phase of the research in which participants were asked for their overall views and suggestions for improvements they felt needed to be made to the model. The model was created on the basis of a literature review on OSFs and potential measures of these factors that could be used to identify their presence within an organisation.

## 6.5 The qualitative study

The qualitative phase of the study was conducted after the conceptual model had been designed and the aim was to establish the need to use HRIS data, and from there to refine and enhance the conceptual model.

### 6.5.1 Aims of the qualitative study

The specific empirical aims for the qualitative study were as follows:

Research aim 1: To determine the need to use HRIS data

Research aim 2: To refine a theoretical model of measures based on organisational success factors derived from human resource information systems to be used in organisational development initiatives

### 6.5.2 Research method

The research method utilised is the way in which information is collected, analysed and understood, as discussed in chapter 1 (Creswell, 2009; 2014; Terre-Blanche et al., 2006). These methods vary, depending on the nature of the research being conducted, as well as the data that needs to be collected and analysed. In terms of the mixed-methods strategy adopted in this study, there were several ways in which data could be collected and analysed (Creswell, 2009; 2014; Creswell & Clark, 2007; Tashakkori & Teddlie, 2010; Teddlie & Tashakorri, 2009). These included open- and closed-ended questions, questionnaires for data collection and statistical and text analysis for the data analysis aspect of the study.

The aim of the qualitative research method was to refine the conceptual model developed on the basis of a review of the literature and update it with the participants' practical experience and knowledge. Once updated, the quantitative phase of the research could commence and the model could be statistically tested.

The phenomenological method was used for the qualitative phase of the research.

Phenomenological research involves capturing and analysing meaningful statements from participants regarding a specific phenomenon and generating a description of the phenomenon (Babbie, 1990; Baran, 2016; Cassell & Bishop, 2019; Creswell, 2009; 2014; Tran 2016).

A phenomenological method was believed to be the best choice for the qualitative phase of the study as the expertise of the participants was needed to analyse the conceptual model created from the literature and provide meaningful feedback that could refine and improve it. This also seemed to be a standard approach when reviewing the work of other students who had similar research aims.

### 6.5.3 Sampling

The selected sampling method used was purposeful sampling (Creswell, 2009; 2014; Teddlie & Tashakorri, 2009). It involves the selection of participants from the population based on specific criteria defined by the researcher. The reason this method was chosen was to ensure that those who formed part of the sample for the second phase of the research were subject matter experts and could enhance the conceptual model developed on the basis of the literature.

The sample ( $n = 8$ ) for the qualitative research consisted of subject matter experts in the Human Capital and Business Excellence Departments at the organisation where the research was conducted.

The reason for selecting a sample of eight was the researcher's contention that saturation point had been reached at interview 7. An additional interview was then conducted to confirm whether this was in fact the case. Once the last interview had been conducted, the responses were briefly analysed and it was determined in consultation with the researcher's supervisor that sufficient data had been collected for the qualitative phase of the research.

#### 6.5.4 Data collection method

A critical step in the research process is the collection of data, and in the qualitative research, several methods for collecting data have been proposed (Creswell, 2009; 2014; Flick, 2018; Gill et al., 2008). Approaches used by researchers for qualitative data collection can be classified into three main types, namely verbal, ethnographic and material approaches (Flick, 2018). According to Creswell (2009), there are four main types of qualitative data collection, namely observations, interviews, documents and audio-visual materials. Interviews are further subdivided into three classifications, specifically structured, unstructured and semi-structured (Gill et al., 2008).

When deciding on a data collection method, the advantages and disadvantages thereof need to be considered. It is critical to understand these before any specific data collection method is selected.

The advantages, according to Creswell (2009; 2014; Gill et al., 2008), of interviews, are that they are useful when the participants cannot be directly observed, the participants can provide historical information, and the researcher has control over the line of questioning. This suited the topic of study as participants were scattered over a large geographic area and the researcher was able to ask specific questions to get their input and refine the conceptual model.

As with any means of data collection, specifically for interviews, there are several challenges that need to be overcome by the researcher that may have an influence on each phase of the data collection and analysis process. The following are some of the specific challenges identified in the interview form of data collection process that need to be considered and overcome (Creswell et al., 2009): They provide indirect information filtered through the views of the interviewees, they provide information in a designed place rather than the natural field setting, the researcher's presence may bias responses, and not all people are equally articulate and perceptive. These challenges were addressed in the study with the detail being provided in section 6.5.7.

Based on a review of the overall advantages and disadvantages of the different methods of collecting qualitative data, a phenomenological interview collection method was selected using

semi-structured interviews (Flick, 2018). A semi-structured interview is one in which a list of questions is compiled to help the researcher explore key topics, while also allowing for additional questions to be asked for clarification and/or to explore the responses provided by the participants (Flick, 2018; Gill et al., 2008). Semi-structured interviews were therefore chosen as the best approach to obtain findings for the study, as they provided the mechanism to pose questions to participants that allowed them the freedom to provide answers based on their experience and knowledge.

Examples of questions that formed part of the semi-structured interviews are as follows:

- What organisational development approaches do you follow when developing interventions at the individual, team and organisational levels to assist your or your client's organisations?
- What sources of data and information do you use to assist you? (Interviews, workshops, policies, etc.)
- Do you make use of HRIS data?
- Is there a bigger need to make use of HRIS data in assisting to design interventions at the individual, team and organisational levels?
- What is your general view of the possible list of organisational success factors identified from the literature based on your experience?
- Can the factors in the model be predicted using data extracted from an organisation's HRIS or similar system?

The data was collected virtually using Zoom and recorded on the Cloud to ensure that it could be accessed at a later stage. Only the researcher was able to access the recordings because a username and password was required. Notes were also made of additional insights gained from the interviews and to ensure that the importance of some of the points specifically made was written down. Participants were advised at the beginning of the interviews that notes would be taken and the interview would be recorded, and they all confirmed that they were comfortable with this. No participants indicated their discomfort with the interview being recorded. The researcher managed consent and confidentiality as follows:

- A consent form was sent to all the participants for their review and signature as part of the participation in the research. These were signed and then returned to the researcher by those participants who agreed to participate in the research. The forms were stored on a laptop requiring a username and password for access, which only the researcher had.
- The questions asked and information requested from the participants based on the interview guide created were not confidential or personal information, such as their ID number.

- Participants' names were not used in the research, and they were each assigned letters for use in further analysis.
- Interview recordings were made using the virtual meeting tool, Zoom, and were securely stored on the researcher's laptop, which requires a username and password only known to the researcher.

### 6.5.5 Data analysis

The next section describes in detail the framework used to analyse the qualitative data and the steps followed in this process.

#### 6.5.5.1 Theoretical framework

(Creswell, 2009, p. 184) formulated the following definition of data analysis:

It is an ongoing process involving continual reflection about the data, asking analytical questions, and writing memos throughout the study. I say that qualitative data analysis is conducted concurrently with gathering data, making interpretations, and writing reports. While interviews are going on, for example, the researcher may be analysing an interview collected earlier, writing memos that may ultimately be included as a narrative in the final report, and organizing the structure of the final report.

The definition of data analysis provided by Creswell (2009) was used for the study as it was believed it was best suited for the research to be conducted. This was due to the concurrent nature of the qualitative phase of the research of analysing data while interviews were ongoing and then gradually forming interpretations and identifying trends in the data being analysed.

Several frameworks for qualitative data analysis can be used, with four main types being identified, each with its own foci, strengths and limitations (Babbie, 1990; Tashakkori & Teddlie, 2010). The first type is Grounded theory that has specific, systematic and logical steps that involve selecting multiple categories in the form of open coding. From these, one of the categories is then selected and positioned within the theoretical model designed. This is referred to as axial coding. A story is then extracted from the connection between the categories which is referred to as selective coding. Case study and ethnographic research is the second type and involves ensuring that there is a detailed

description of the individuals or participants involved in the research. This is then analysed for overall themes and/or issues that can be identified.

The third type is phenomenological research that involves capturing and analysing meaningful statements of participants about a specific phenomenon and generating a description thereof.

Narrative is the fourth and the research focuses on retelling participants' stories using tools such as the plot, setting of the events, activities involved and the result.

Based on the frameworks identified in the literature, phenomenological research was deemed best suited to the qualitative phase of the research and thus selected. This was due primarily to the requirement for the qualitative phase of the research of obtaining the inputs of participants of the phenomenon of creating a model using data drawn from an HRIS to provide an indication of organisational success based on their experience, knowledge and skills.

#### *6.5.5.2 Data analysis process*

Once data has been gathered, the next step in the research process is to analyse it to achieve the aims of the research and derive meaning from the data collected based on the type of framework being used. This section explains the detailed process followed to analyse the data once it had been collected.

Data analysis forms a critical step in the research process where information can be sorted and meaning derived. The qualitative data analysis process recommended by Creswell (2009) is depicted in figure 6.3

#### **Figure 6.3**

##### *Data Analysis in Qualitative Research*



*Note.* Steps in the Data Analysis Process in Qualitative Research. From *Research design qualitative quantitative and mixed methods* (3<sup>rd</sup> ed.) (p. 185), by Creswell, 2009, Sage.

### **Phase 1: Organising and preparing data for analysis**

The first step in the data analysis process is to ensure that the raw data that has been collected is organised and prepared for data analysis. If data was collected by means of interviews, then it may need to be transcribed, notes taken during the interviews reviewed and finalised, and data arranged in different categories if additional sources of information were used (Creswell, 2009; Teddlie & Tashakorri, 2009). This was used for the study to organise and prepare the data for analysis by reviewing and electronically transcribing notes taken during the interviews into an excel template.



## **Phase 2: Reading through all the data**

Once data has been prepared and arranged into different types or categories, it is critical to read through it to gain an overall understanding of the information. This process may involve the recording of notes in the actual transcripts, in addition to field notes taken, and any general ideas (Creswell et al., 2009). This occurred for the study as the researcher read through all the notes taken during the interviews that had been transcribed into an excel template to gain an overall understanding of the information.

## **Phase 3: Coding the data (hand or computer)**

The next step in the qualitative process is to code the data either using software designed for the purpose or doing it by hand. Coding involves the creation of smaller more manageable pieces or chunks of data based on the information reviewed and giving each a descriptor. Researchers are encouraged to generate a variety of different codes and descriptions to capture unique observations in the data, as well as answer their research questions (Belotto, 2018; Cassell & Bishop, 2019).

Structural coding is one of the particularly useful ways in which data can be coded where specific pieces of information are coded in such a way that they can answer the research questions. This specific method of coding allows the number of codes to be greatly reduced and thereby enhances the researcher's ability to make meaning of them (Belotto, 2018). This approach was used during the second phase of the current research to assist in the generation of a limited number of codes that helped to answer the research questions.

## **Phase 4: Themes/descriptions**

Once codes for the data have been generated, the next step in the process is to create descriptions (Belotto, 2018). A description is defined as "a detailed rendering of information about people, places, or events in a setting" (Creswell, 2009 p. 189). The objective of researchers is then to create between five and seven overall themes from the codes developed and present these in their findings as headings, supported by information gathered during the data-gathering process (Belotto, 2018, Creswell, 2009). It is a critical step in the data analysis process.

### **Phase 5: Interrelating theme/descriptions**

Once themes have been developed, the researcher's next step is to start connecting them into a cohesive narrative depending on the strategy being used. The use of figures, tables and other visual aids is often seen in this phase of the data analysis because it assists the researcher with the discussion (Cassell & Bishop, 2019; Creswell, 2009).

### **Phase 6: Interpreting the meaning of themes/descriptions**

The final step in the qualitative data analysis process is for the researcher to interpret the themes or descriptions created. This requires the researcher to reflect on what has specifically been learned from the process, and it can assume many forms depending on the type of qualitative research conducted and the aims of the research. One method of interpretation is to compare what has been found in the literature to what was determined in the research process and either confirm or reject what was found in the literature (Belotto, 2018; Creswell, 2009; 2014). This was used for the study by reviewing the themes created from the data analysis process against what had been found in the literature.

#### 6.5.6 Reporting

The findings of the qualitative research are presented in chapter 7 using the theme and subtheme headings created during the data analysis phase in order to provide an overall discussion of what came to light during this phase of the research. Owing to the large number of themes and subthemes created, only those subthemes considered particularly noteworthy by the researcher are discussed, either because of their uniqueness or contribution to the research aims of the study. The findings of the qualitative phase of the research were used to enhance the conceptual model designed on the basis of the literature review, which generated a list of possible indicators of organisational success and a list of their possible measures.

### 6.5.7 Strategies employed to ensure quality data

A vital aspect of any research is to ensure the quality of data gathered and analysed. In qualitative research, one of the main issues highlighted is the difficulty in establishing reliability and validity of the information – hence the need for the researcher to take steps to ensure the quality of the data (Belotto, 2018; Creswell, 2009; 2014; Lincoln & Guba, 1985; 2000; Tran, 2016; Wahyuni, 2012). The two terms used in qualitative research that are similar to reliability in quantitative research are consistency and dependability (Lincoln & Guba, 1985; Wahyuni, 2012). According to Lincoln and Guba (2000) and Wahyuni (2012), there are several ways in which data quality can be ensured in qualitative research, namely credibility, transferability, dependability and confirmability. Each of these elements is discussed in greater detail below.

#### 6.5.7.1 Credibility

The first element to ensure qualitative data quality is credibility. Credibility in qualitative research is correlated to internal validity in quantitative research and refers to the comparability between the realities that were observed among the respondents and the realities that exist in their minds (Lincoln & Guba, 2000; Tran, 2016). To achieve the requirements to meet credibility, the researcher took the following steps: First in the interviews conducted during the data collection phase of the qualitative phase of the research, the participants' answers were repeated to them for clarification, and summary statements were used in several instances using phrases, such as "if I understood you correctly you are saying ..." and "do you mean ...", as well as "if I am understanding you correctly ...". Second member checking was completed by submitting requests to the participants for a session in which feedback could be given, and their input obtained on the process followed, as well as any potential changes or enhancements they felt were required, could be discussed. Three of the original participants responded and sessions were held with them. During the session, there was a discussion on the feedback provided on the data analysis process followed, which included showing the participants the notes taken, the way in which data had been broken down and analysed, the final themes and subthemes that had been generated, the insights that were deemed to have been gained from the process, and the eventual refinements and enhancements that were made to the initial conceptual model. All of them agreed that the process made sense and was an accurate reflection of their views and the overall findings, as well as the changes and refinements made to the conceptual model.

Finally referential adequacy was ensured by sending a meeting invite to the participants to confirm the time and date, recording qualitative interviews and storing them on the Cloud and making notes during the interviews.

#### *6.5.7.2 Transferability*

Transferability can be defined as “the ability to apply the results of research in one context to another similar context. Also, it refers to the extent to which a study invites readers to make connections between elements of the study and their own experiences” (Stevenson, 2016, p. 147). Overall transferability involves whether the findings can be applied in other contexts or with other respondents, and according to Wahyuni (2012), this resembles external validity in quantitative research. The researcher made all possible attempts to collect sufficiently detailed descriptions of data, also referred to as “thick descriptions” (Creswell, 2009). As indicated earlier in the chapter, purposive sampling was used in this study. This, according to Lincoln and Guba (1985; 2000; Wahyuni, 2012) enhances trustworthiness and transferability.

To further ensure transferability of the results to other situations and settings, the researcher provided context to the participants and explained how they had been selected for the research before the interviews were conducted and during the interviews themselves. Details on the number of participants in the study, their demographic details and the methods used for data collection and analysis were also included in the study to ensure overall transferability of results.

#### *6.5.7.3 Dependability*

Dependability is associated with reliability in quantitative research (Lincoln & Guba, 1985; Wahyuni, 2012). According to Lincoln and Guba (1985) and Wahyuni (2012), there can be no validity without reliability (and thus no credibility without dependability). A demonstration of the former is sufficient to prove dependability. To ensure dependability of the results of the study, details of the research context and the methods used were provided, as well as an overall assessment of the process used to analyse the information

#### 6.5.7.4 Confirmability

Confirmability is the degree to which the findings are the product of the focus of the inquiry and not of the biases of the researcher (Lincoln & Guba, 2000; Wahyuni, 2012). According to Lincoln and Guba (1985) and Wahyuni (2012), a confirmability audit trail should be established to enable the auditor to determine if the conclusions, interpretations and recommendations can be traced back to their sources and if they are supported by the inquiry. To improve confirmability, the researcher kept research notes, reflection notes and all the raw data.

To ensure confirmability of the results, data was checked and rechecked and then documented. Responses provided that did not support the overall research aims were recorded. The data was also evaluated by a colleague who utilised qualitative data in the course of her employment.

### 6.6 Model refinement

The conceptual model that was developed as part of the literature review phase has been reviewed and summarised in section 5.6 to provide a possible list of OSFs, as well as a possible list of their measures that could be used to indicate the presence of the factors identified using an HRIS.

Once the qualitative phase of the research had been completed and input had been gathered from participants and experts, the conceptual model was refined and new OSFs and measures were added to existing factors and existing ones were changed and/or modified based on the inputs received. A significant input to the model's refinement was the process of creating the survey to be used to statistically test the model. This process led to further refinement of the model to ensure that the variables to be measured were clearly explained and differentiated.

### 6.7 The quantitative study

The main aims of this phase of the research, the sample that responded to the questionnaire from the population, the instrument created, data collection and the analysis of the data are described in this section of the chapter.

### 6.7.1 Aims of the quantitative study

The specific and most important empirical aims for the quantitative phase of the study were formulated as follows:

Research aim 1: To develop a valid and reliable questionnaire to measure the need for the use of HRIS data and organisational success factors

Research aim 2: To measure the constructs of HRIS, organisational culture, leadership, internal organisational processes and other constructs extracted from models on organisational performance and determine their key components

Research aim 3: To determine and test the empirical relationship between the construct of HRIS and measures based on organisational success factors

Research aim 4: To assess whether biographical variables play a moderating role in the use of HRIS

Research aim 5: To develop and test an empirical model for HRIS and measures by means of structural equation modelling

Research aim 6: To make recommendations for the discipline of industrial and organisational psychology and human resource management on HRISs and measures based on organisational success factors for future research.

### 6.7.2 Research method and design

A survey method was chosen for this phase of the research. Survey design provides a quantitative or numerical description of the trends, attitudes or opinions of a population by studying a sample of that population. From the sample results, the researcher generalises or makes claims about the population (Babbie, 1990; Mohajan, 2020; Pecáková, 2016).

A survey is undoubtedly the best method for collecting data for a population that is too large to test directly (Babbie, 2001; Mohajan, 2020). The main purpose of a survey is to learn more about a population by surveying only a sample of that population and then translating their responses into various types of data such as frequency distributions, percentages and correlations analysis, to name a few (Mohajan, 2020; Pecáková, 2016). Two types of surveys are commonly used for research purposes, namely cross-sectional and longitudinal (Babbie, 1990; Mohajan, 2020). In a cross-sectional survey, data is collected once at a specific point in time, whereas longitudinal surveys

involve data collected over a period of time (Creswell, 2009; 2014; Mohajan, 2020). A cross-sectional survey design was selected for the purposes of the research.

The advantages of a survey are that it is inexpensive, can be conducted quickly and many outcomes and risk factors can be assessed (Levin, 2006; Setia, 2016). These key benefits were considered in selecting an online survey approach to collecting the data and assisted the researcher to garner a significant number of responses from a small population.

For the quantitative study, a survey with directional statements was used. The researcher designed this survey because when conducting the literature review on the topic of the research, he was unable to find a suitable instrument for this phase of the research. The survey that was designed had a dual purpose. The first was to establish whether the participants agreed with the list of measures and OSFs, and the second was to gather data to assist in determining the relationships behind the various survey items in order to ascertain if any constructs could be generated to assist with further statistical analysis and the creation of a model.

### 6.7.3 Population and sample

A population for research purposes can be defined as “the theoretically specified aggregation of study elements” (Babbie, 1990, p. 193). Although formulated several decades ago, this definition is deemed still relevant for research that is conducted today.

The organisation in which the data was collected is JSE listed, with operations in different geographic locations on different continents. The context of the organisation that was used for the research could cause the metrics identified in the HRIS to vary, affecting the generalisability of the study. The purposive random sample technique was used on a convenience sample, from a total population of 204, owing to the nature and aims of the research, to target practitioners in the Human Capital and Operational Excellence Departments on the African continent and afford each of them an equal chance to participate in the research.

#### 6.7.3.1 Population and sample considerations

The sample for the research was chosen specifically to test and refine the conceptual model created on the basis of the literature review. The group that was identified in the Human Capital and

Operational Excellence Departments were educated, with significant experience in their fields and/or with HRISs, and who were able to provide feedback based on their own experiences, knowledge and understanding in their careers, and not just their experience in the organisation. The final sample utilised for the statistical analysis of the model reviewed during the quantitative phase of the research was 118. The sample might appear small, but it was considered adequate due to the small population of practitioners available to the researcher within the organisation on the African continent and who met the requirements needed to participate in the research.

In deciding which population to use and the sample that the researcher might eventually have been able to obtain, several possible courses of action were considered. Ultimately it was decided to focus on a smaller population and therefore obtain a smaller sample to maximise the contribution they could make to reviewing and refining the model that had been developed. The intention was to utilise a more specific and focused approach to improve the quality of the responses instead of opening the survey up to many possible participants who could not contribute to the review of the model and its refinement.

Another possible course of action considered was to extract data from an HRIS/HCM to test the OSFs and their possible measures identified directly with data, but this method was not chosen due to the following:

- The researcher was unable to find an existing model on the use of HRISs to extract data and provide an indication of the state of OSFs that could be used as a foundation, tested and then refined. The researcher therefore felt that a model created from the literature should be reviewed by SMEs in the field first to determine its validity and reliability, as well as to refine and improve it. The refinements and enhancements that emerged from the second phase of the study alone made notable differences when empirically testing the model. Additional enhancements were made, based on the statistical analysis completed during phase 3 of the research, which further improved the model and the logic of how it could be used practically in an organisation.
- The Protection of Personal Information Act (POPI) and access to information restrictions on drawing data directly from an organisation's HRIS/HCM system posed a significant challenge to testing the model with actual data and had a significant influence on the method ultimately chosen to review the model.
- The practicality of drawing the data from an HRIS/HCM system was also a factor that determined the current approach adopted. The time required to draw data from different systems, in different formats, with different naming conventions, recording mechanisms and



then review and collate the data was deemed too significant and beyond the scope of the current research.

### 6.7.3.2 Case screening

Case screening was conducted to enhance the validity of the sample and quality of the responses by removing nonresponsive, incomplete and partially complete cases from the original number of responses. This reduced the sample from 152 initial responses to the survey to 118, which was then used for the statistical analysis on the model created. The process followed and the data used is discussed in this section. The population targeted was 204 with 152 participants logging on to the survey, which equals a 72.5% hit rate.

#### a) Missing value analysis (scale item level)

The number of cases observed with missing values was identified, and the results are shown in table 6.1.

**Table 6.1**

#### *Case Analysis Results*

	<b>n</b>
Incomplete	25
Partial	8
Complete	119
<b>Total</b>	<b>152</b>

119 out of 152 = (78.2% completion rate)

119 of 204 = (58.3% completion rate from the population)

#### b) Unengaged responses (construct level)

Cases were inspected with SD = 0 as the indicator for unengaged responses. The number of cases identified and excluded equalled 1. Valid data for the sample was identified as n = 118 and indicates that 99.15% of the sample was valid. The second part of the survey measured specific elements of an

HRIS. The sample utilised for this section for the statistical analysis was n= 105 after the unresponsive cases had been removed.

#### 6.7.4 The measuring instrument

For the purposes of the research, a survey was developed by the researcher that was not based on any existing surveys or instruments.

##### *6.7.4.1 Rationale for and background on the instrument*

The survey was created on the basis of the possible OSFs, and their possible measures identified in the literature, which was then reviewed during the qualitative phase of the research. It contained directional items on the measures and OSFs themselves. The reasoning behind not using an existing instrument was that the model that had been created was not based on any existing models. Hence, in the researcher's opinion the development of a new instrument was necessary that could be used to test the model designed.

##### *6.7.4.2 Objective of utilising the instrument*

The survey was implemented to gather the perspectives of practitioners in the Human Capital and Operational Excellence Departments of the organisation on a list of possible OSFs and their possible measures, the ability of an HRIS to provide data that could be used to predict them and the need to use HRIS data. The results helped with the development of a model, which it was anticipated, would assist IOPs and OD practitioners in the development of initiatives and interventions to assist organisations. Additionally, the data gathered on the use of HRIS data might support the need for greater use of this information in the field of IOP.

##### *6.7.4.3 The content of the questionnaire*

The survey that was implemented contained three distinct sections. The first section contained the introduction to the research, which explained who the researcher was, what the research was

about, why participants had been selected, storage of responses and confidentiality. The second section requested the participants to answer demographic questions on their age, educational level, country of residence, race and gender. The third section contained instructions on responding to the items with a Likert rating scale of 1 to 5 and the definition of terms that had been provided to assist in responding to the items.

The survey consisted of five pages and 24 questions. Questions 6 to 17 dealt with specific OSFs and their measures, whereas questions 18 to 24 asked respondents for feedback on specific points of interest for the research. Many questions were constructed in a matrix style with the rating scale above to make it easier for the respondents to answer. No comments section was included owing to the nature of the statements to be rated. The survey and the items developed are contained in Annexure B.

### **Section A: Introduction and context**

Section A of the survey included the online consent form for the participants. It included an overall introduction to the researcher, the research being conducted, the purpose of the survey, how records would be kept, who had approved the research, how the researcher and supervisor could be contacted during office hours, and that by proceeding with the survey, the participants were consenting to participate in the research and acknowledged that their information would be confidential.

### **Section B: Demographic data**

Once the overall context for the research had been given, section B of the survey focused on collecting demographic details of the participants for the purposes of the research and any potential statistical analysis. These included their age, race, gender, highest qualification, and country of residence.

It is important to note that although participants were asked to provide details on five demographic-related questions in the survey, only age and education were the focus of the third phase of the research for completion of the statistical analysis. The reason for the use of only these two demographic fields was that the focus of the research was primarily on the development of a model and not on the potential differences between groups. Any potential differences identified between

the groups were therefore of no significance for to the model the researcher was trying to develop since no model could be found on the topic to use and refine. Age and education, however, were chosen because they were deemed able to provide useful information on any potential differences between the groups especially in relation to item 15.6, “Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation”.

**Section C: Statements with a definition of terms and questions**

Section C of the survey included the overall instructions on how to complete the survey. In the first section of the survey on the model, statements were grouped together in relation to the OSF that was being reviewed to gain information on the model that had been developed. The second section of the survey focused on ranking the OSFs and obtaining the participants’ views on different aspects of an HRIS.

The items in the first section were arranged in matrix format to facilitate rating. Participants were asked to tick the appropriate rating on the following scale for the items displayed in table 6.2 (Vagias, 2006):

**Table 6.2**

*Scale used in the Survey*

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

Additionally, a definition of terms was provided before each grouping of items, to ensure that the participants understood the terms being used and could therefore provide an informed rating of the items. The second section of the survey included a ranking question and several questions on HRISs. Instructions on how to answer this section were also provided. There were 59 items in the first section of the survey and 11 in the second, with a total of 70 items. As mentioned earlier, the researcher was unable to find an existing survey on the use of HRISs to provide an indication of organisational success, OSFs and their possible measures – hence the creation of a new survey based on the literature review completed in phase 1 of the research. The validity and reliability of the survey and how it was established are described in the next section.

### 6.7.5 Validity and reliability

Validity in quantitative research refers to “the legitimacy of the findings (i.e., how accurately the findings represent the truth in the objective world.)” (Venkatesh et al., 2013, p. 32). This is a critical element in the research that needs to be addressed, and for this purpose, a new survey was designed to measure participants’ views on the OSFs and their possible measures, as well as the usage of HRIS data. There are three major types of validity that one needs to ensure are met in quantitative research, namely measurement, design and inferential validity (Teddlie & Tashakkori, 2003). Measurement validity can be associated with content and construct validity, design validity can be linked to internal and external validity and inferential validity is the statistical conclusion validity (Cortina, 2020). Content and construct validity were identified as the main types of validity to be established as they would then confirm the measurement validity.

Content validity is “the extent to which a scale’s items, in the aggregate, constitute a representative sample of the topic’s content domain” (Okoro et al., 2019, p. 34). For the survey, content validity was established by conducting a pilot study whereby individual sessions were held with three participants from phase 2 of the study, to review the survey and its structure, readability, statements and content. The interviews conducted for the pilot study proved beneficial in refining the survey to ensure it was ready for distribution to the research population and to maximise the response rate.

The changes introduced included rephrasing of items, changes to the layout and an addition of the definition of key terms in the sections where they were used to enhance the participants’ understanding of the key concepts not just at the beginning of the survey, as had initially been the case. The survey was also reviewed by the researcher’s supervisor and the statistician who would be performing the statistical analysis. Improvements and enhancements were then made to enhance the readability, ease of use and the look of the survey, and to confirm that the statements reflected what was being researched.

Construct validity for research is defined as “whether a scale measured a construct or dimension that it was purported to measure” (Barry et al., 2011, p. 99). The initial intention for the research was to utilise exploratory factor analysis (EFA), specifically principal component analysis (PCA) to determine the validity of any constructs and their possible measures. Once the data gathering for phase 3 of the research had been completed, in accordance with the population and sample requirements specified in section 6.7.3, however, it became apparent that this approach would not work because of the limited sample size available to the researcher (n = 118). Another reason was

that the constructs and their indicators had been created on the basis of the literature review conducted during phase 1 of the research and the results of the correlation analysis conducted using Kendall's tau\_b, as presented in section 8.7. The results of the literature review and correlation analysis provided a list of proposed constructs and their possible measures. Another consideration for the use of reliability analysis as an alternative approach was that the instrument used by the researcher had to be created and was not based on an existing instrument.

Based on these considerations, reliability analysis was used as an alternative supportive means to statistically review each of the proposed constructs and their possible measures to determine if they were statistically significant and could be included in the model created and subjected to PLS-SEM, which was the primary analysis completed to evaluate the model. Reliability analysis relates to how the internal consistency of the items in the study and their measurement of the same construct are determined (Field, 2005; Pallant, 2016). The results of this analysis are presented in section 8.3.1. This was done by providing a Cronbach alpha and IIC value for each of the constructs with their proposed measures.

As a complementary approach, EFA, specifically PCA, was conducted, despite the sample and other limitations, to determine what the results of this analysis would be and if there were any viable alternatives to the constructs and possible measures proposed on the basis of the literature review and analysed using the reliability analysis. Factor analysis is designed to take a large set of variables and help to identify ways of reducing it into smaller factors (Field, 2005). The results of this analysis are presented and discussed in section 8.3.1.1.

Once the constructs and their proposed measures were deemed to be statistically significant, they were incorporated into the model that was subjected to the PLS-SEM statistical analysis. The validity of the constructs was determined using several outputs from the PLS-SEM analysis, specifically, the internal consistency reliability of the model, the internal indicator loadings of the indicators on their assigned construct and convergent and discriminant validity. Convergent validity is defined as "the extent to which a measure correlates positively with alternative measures of the same construct" (Hair et al., 2017, p. 137). Discriminant validity reviews to what extent the constructs are different from other constructs (Hair et al., 2017). Both evaluation criteria are discussed again in section 8.3.1. The results for the convergent and discriminant validity are discussed in detail in sections 8.8.1.2 and 8.8.1.3.

### 6.7.6 Composite reliability

Overall reliability relates to the quality of the measurement and focuses on whether it yields the same results when repeated (Straub et al., 2004). A scale would be considered reliable if the results were the same consistently. The reliability of the constructs in terms of their internal consistency was established using the composite reliability values obtained from the PLS-SEM analysis.

### 6.7.7 Data collection method

The method utilised to collect data for this phase of the research was an online survey administered through the tool, Survey Monkey.

### 6.7.8 Data analysis and statistical methods

The results of the survey were statistically analysed using quantitative techniques and tools. This was completed utilising the statistical software SPSS 27 (Statistics Package for Social Scientists). Several statistical techniques and methods were adopted to analyse and refine the data obtained from the survey distributed. The different statistics that were used are discussed in this section.

#### 6.7.8.1 *Descriptive statistics*

One of the first statistical analysis methods conducted by a researcher is that of descriptive statistics. According to Pallant (2016), these statistics have the following three primary uses: (1) they describe the characteristics of the sample in the method section of the research; (2) they check the variables for any violation of the assumptions underlying the statistical techniques used to address the research questions; and (3) they address specific research questions.

#### a) Mean

One of the simplest yet most effective statistical measures that can be obtained from the data analysed is the mean. The mean is a “hypothetical value that can be calculated for any data set; it doesn’t have to be a value that is actually observed in the data set” (Field, 2005, p. 4). It is a model that helps to summarise the data that has been analysed (Field, 2005; Ho, 2006; Pallant, 2016).

The mean was calculated for each of the items in section 1 of the survey, which focused on the HRIS model used to provide an indication of OSFs within an organisation, and which included the proposed measures of the OSFs and OSFs themselves. A mean was also calculated for item 19) in part 2 of the survey that focused specifically on HRIS data usage. The mean for item 19) was then calculated for the independent variables analysis for age and education to determine if there were any differences between these groups.

#### b) Standard deviation

Put simply, a standard deviation is the way in which a mean represents the data that has been analysed. A large standard deviation indicates that the actual data is a significant distance from the mean identified, while a low standard deviation indicates an extremely limited distance between the actual data and the mean (Field, 2005). Items in the model where a significant standard deviation of (> 1) was identified, are discussed in detail in chapter 8.

#### c) Frequencies

This type of statistical analysis indicates how frequently an observation occurs within the data (Field, 2005). The frequency distribution of the data analysed is discussed in chapter 8 in the form of tables that provide details on the demographics of the sample, as well as the level of agreement among the participants on the items that formed part of the survey. The level of agreement was calculated using the “agree” and “strongly agree” ratings from the survey, which then constituted the agreement percentage. The cut-off level for the agreement percentage used for most of the items was 50%. This was agreed in consultation with the statistician who assisted with the statistical analysis. The reasoning for the decision was that any agreement level of 50% and above indicated that respondents had selected a rating higher than that of 3 – “neither agree nor disagree” for an



item, and this therefore indicated some level of agreement with the item in the survey. Because the survey was designed to solicit the participants' input on the items and was exploratory in nature, 50% agreement was deemed sufficient to proceed with further statistical analysis.

#### *6.7.8.2 Inferential statistics*

Once the data from the population has been described using descriptive statistics, the next step in the quantitative data analysis process is to use inferential statistics to test the hypotheses of the research being conducted (Ho, 2006).

##### *a) One-sample t-test*

There are a variety of t-tests available to researchers using statistical software packages, such as SPSS, which can be run on the data being analysed. For the purposes of this research, the one-sample t-test was chosen. This type of t-test determines whether the observed mean is different from a set mean (Field, 2005). The one-sample t-test was used to determine whether items being reviewed in both sections of the survey were statistically significantly higher than the test value of 3, specifically the survey rating "neither agree nor disagree". To interpret the results, the following items were used: Firstly, the mean was used to establish if the ratings provided by the participants were above the test value of 3. Secondly, the significance levels of  $p < 0.05$  were used to identify items where the population means were statistically significantly different. Thirdly, the t values were reviewed to determine which items had a positive t value, which indicated that the mean difference was positive (Pallant, 2016). Fourthly, the effect size of the items was used, and any item with an effect size of 0.2 and above for the point estimate was identified as statistically significant (Cohen, 1988; Goodhue et al., 2011).

##### *b) One-way between-groups ANOVA with post hoc tests*

As a means of identifying differences between groups with more than two categories, the one-way between-groups ANOVA with post hoc tests was used. This statistical method is applied when there is one independent variable with different levels and one dependent continuous variable (Field, 2005). The groups that the researcher focused on specifically were age and education to determine

if there were any significant differences on the items being measured, specifically item 15.6 on the use of data extracted from an HRIS to provide an indication of the presence of OSFs in an organisation. The significance levels of the various items were evaluated using Levene's test of homogeneity of variances, and items with a significance level of  $p < 0.05$  were identified as being statistically significant.

### c) Correlation analysis

Correlation analysis is a statistical method used by researchers to describe the direction and strength of the association between two variables (Field, 2005). For the purposes of this research, the nonparametric Kendall's tau\_b statistical method was chosen for analysis of the data owing to the size of the sample and the violation of the parametric assumptions. Kendall's tau\_b correlation analysis was used to determine the strength and direction of the relationship between the measures correlated to specific OSFs and between the OSFs themselves, and is considered to be more accurate than Pearson's correlation for generalising results to a larger population (Field, 2005). It was also utilised to determine the relationship between the OSFs and the item on the usage of HRIS data. In accordance with the guidance provided by Field (2005), the strength of the association was quantified between items based on the correlation coefficients as a weak association = 0.07, a medium association = 0.21, and a strong association = 0.35 and above.

The approach adopted in interpreting the results was to review the correlation between each of the possible measures proposed as they related to OSFs, in terms of what had been identified in the literature. The second was to determine the relationship between the OSFs themselves. The third was to determine the correlation between the OSFs and item 19) in the survey on "Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation" to determine if there was any relationship. Each of these elements of the analysis are discussed in detail in section 8.7.1 in chapter 8.

For the purposes of this research, a cut-off value of 0.21 between the items was used because this was deemed to offer a significant correlation between the items. When following the guidance provided by Field (2005), this is classified as a medium association. The application of the cut-off value used was that any item that had initially been identified in the literature as being a possible indicator for a specific OSF was removed from further statistical analysis because the participants did not provide sufficient support for it. This resulted in the removal of several initial indicators that were not used in further statistical analysis.

#### d) Exploratory factor analysis (EFA)

EFA helps researchers to identify the structure of a particular problem and to conduct an analysis of that phenomenon (Pett et al., 2003). This was initially meant to be how the validity of the constructs was to be established, but owing to the way the constructs were formulated and the limitations with the sample collected, it was conducted as a complementary analysis to attempt to find potential alternatives to the constructs created and tested with the reliability analysis. It was not, however, utilised for the purposes of the model development or to establish the validity of the constructs created and their possible measures.

#### e) Reliability analysis

Since EFA was not a viable means, by which the constructs could be statistically tested, the model that was created was subjected to reliability analysis that was used as an alternative means to analyse the proposed constructs. The purpose of reliability analysis is to ensure that items that make up the scale consistently reflect the construct they are measuring (Pallant, 2016). For the research conducted, this was used as the supporting means of establishing whether the measures included as items in the survey reflected the OSF they were correlated to, which was identified in the literature review, and if these items and the item on the OSF itself could then be reviewed as a construct. The reliability analysis results were interpreted using the guidelines provided by Pallant (2016) with Cronbach alpha values of 0.7 and above being considered acceptable and the inter-item correlation (IIC) of 0.3 and above being deemed acceptable. However, owing to the exploratory nature of the research, the creation of a new instrument to measure the proposed model, Cronbach alpha values approaching or equal to 0.6 or above and IIC values approaching or equal to 0.3 or above were considered acceptable for the purposes of the research, and therefore any constructs that met these requirements were utilised for further statistical analysis with their indicators (Pallant, 2016).

#### f) Structural equation modelling (SEM)

SEM “enables researchers to incorporate unobservable variables measured indirectly by indicator variables” (Hair et al., 2017, p. 31). For SEM, there are two primary types that can be used by researchers. The first is covariance-based SEM, and the second partial least squares SEM (Hair et al.,

2012; Hair et al., 2017; Willaby et al., 2015). CB-SEM and PLS-SEM have different primary foci. CB-SEM is confirmatory in nature, whereas PLS-SEM is primarily used for prediction purposes (Hair et al., 2012; Hair et al., 2017).

PLS-SEM and traditional CB-SEM share a common history and are often regarded as competing methods of analysis (Hair et al., 2011; Willaby et al., 2015). This, however, is not the case with both methods having different strengths and weaknesses. Researchers need to carefully consider which method is most appropriate for what they are trying to achieve. A software package was developed to assist with running the analysis for PLS-SEM. This software package is SmartPLS (Ringle et al., 2015). PLS, as described by Willaby et al. (2014, p. 73), is “a data analysis technique for testing theoretical relations among a system of variables, closely related to Structural Equation Modelling (SEM)”. PLS is considered a suitable alternative to the more traditional CB-SEM which is more often used in psychological research (Willaby et al., 2014). It can handle incredibly complex models with many indicators and latent variables that traditional CB-SEM is not suited for (Hair et al., 2017).

- Preliminary considerations

When this research was initially planned, CB-SEM was deemed the best approach to develop the model, which was the main aim of the study. However, owing to the sampling approach used to select only SMEs that could provide quality input and feedback on the model, this resulted in the generation of a small sample ( $n = 118$ ). Because of the sample constraints, traditional EFA could not be used to assess the validity of the constructs that had been proposed, based on the literature review completed during phase 1 of the research and the input obtained during phase 2 of the research. Reliability analysis was therefore used to statistically test the constructs, with EFA being used a complementary approach to determine whether there were any viable alternative constructs and measures to consider other than those already tested. Two criteria from the evaluation of the measurement model, specifically convergent and discriminant validity, were used to assess the validity of the constructs. This is explained further in section 8.8.1 in chapter 8.

In addition to the limitations the researcher encountered was also the nature of the model itself that the researcher wished to develop and its purpose of providing predictive power outside of the sample. The intention was to utilise specific constructs with their indicators, which it was believed could be assessed based on data drawn from an HRIS or related system that could then, in turn, be used to provide an indication of other constructs and their indicators. With these considerations in mind, an alternative to CB-SEM was sought that could help to achieve the research aims, and PLS-

SEM was therefore evaluated as a suitable alternative based on the considerations discussed in this section.

Before selecting PLS-SEM as the type of SEM for further statistical analysis, it is essential that considerations are made, as per those discussed by Hair et al. (2017) in table 6.3 to help researchers decide which type of SEM to use.

**Table 6.3**

*Issues Relevant for the Application of the PLS-SEM*

Data Characteristics	
Sample size	<ul style="list-style-type: none"> <li>No identification issues with small sample sizes</li> <li>Generally achieves high levels of statistical power with small samples</li> <li>Larger sample sizes increase the precision (i.e., consistently) of PLS-SEM estimations</li> </ul>
Distribution	<ul style="list-style-type: none"> <li>No distributional assumptions; PLS-SEM is a nonparametric method</li> </ul>
Missing values	<ul style="list-style-type: none"> <li>Highly robust as long as missing values are below reasonable level</li> </ul>
Scale of measurements	<ul style="list-style-type: none"> <li>Works with metric data, quasi-metric (ordinal) scaled data, and binary coded variables (with certain restrictions)</li> <li>Some limitations when using categorical data to measure endogenous latent variables</li> </ul>
Model Characteristics	
Number of items in each construct measurement model	<ul style="list-style-type: none"> <li>Handles constructs measured with single- and multi-item measures</li> </ul>
Relationships between constructs and their indicators	<ul style="list-style-type: none"> <li>Easily incorporates reflective and formative measurement models</li> </ul>
Model complexity	<ul style="list-style-type: none"> <li>Handles complex models with many structural model relations</li> </ul>
Model setup	<ul style="list-style-type: none"> <li>No causal loops (no circular relationships) are allowed in the structural model</li> </ul>
PLS-SEM Algorithm Properties	
Objective	<ul style="list-style-type: none"> <li>Minimizes the amount of unexplained variance (i.e., maximizes the R squared values)</li> </ul>
Efficiency	<ul style="list-style-type: none"> <li>Converges after a few iterations (even in situations with complex models and/or large sets of data) to the optimum solution; efficient algorithm</li> </ul>
Nature of the constructs	<ul style="list-style-type: none"> <li>Views as proxies of the latent concept under investigation, represented by composite variables</li> </ul>
Construct scores	<ul style="list-style-type: none"> <li>Estimated as linear combinations of their indicators</li> <li>Are determinate</li> <li>Used for predictive purposes</li> <li>Can be used as input for subsequent analyses</li> <li>Not affected by data inadequacies</li> </ul>
Parameter estimates	<ul style="list-style-type: none"> <li>Structural model relationships are generally underestimated and measurement model</li> </ul>

	<p>relationships are generally overestimated when estimating data from common factor models</p> <ul style="list-style-type: none"> <li>• Consistency at large</li> <li>• High levels of statistical power</li> </ul>
Model Evaluation Issues	
Evaluation of the overall model	<ul style="list-style-type: none"> <li>• No established goodness-of-fit criterion</li> </ul>
Evaluation of the measurement models	<ul style="list-style-type: none"> <li>• Reflective measurements models: reliability and validity assessments by multiple criteria</li> <li>• Formative measurements models: validity assessment, significance and relevance of indicator weights, indicator collinearity</li> </ul>
Evaluation of the structural model	<ul style="list-style-type: none"> <li>• Collinearity among sets of constructs, significance of path coefficients, criteria to assess the model's predictive capabilities</li> </ul>
Additional analyses	<ul style="list-style-type: none"> <li>• Impact-performance matrix analysis</li> <li>• Mediating effects</li> <li>• Hierarchical components models</li> <li>• Multi-group analysis</li> <li>• Uncovering and treating unobserved heterogeneity</li> <li>• Measurement model invariance</li> <li>• Moderating effects</li> </ul>

*Note.* Issues Relevant for the Application of the PLS-SEM. From *A primer on partial least squares structural equation modeling (PLS-SEM)* (2<sup>nd</sup> ed. (p. 43), by Hair et al., 2017, Sage.

For the purposes of this section on PLS-SEM, considerations proposed by Hair et al. (2017) are used for selecting PLS-SEM that are classified into four categories based on the initial considerations proposed by Hair et al. (2011), as indicated in table 6.3. The first is the data, the second the model properties, the third the PLS-SEM algorithm, and the fourth the model evaluation issues. Each of these is discussed in the sections below.

According to Hair et al. (2017), based on the overall four categories, there are several reasons why the researcher should ultimately choose PLS-SEM. The reasons are as follows: The goal of the research is identifying key, important or driver constructs. Formatively measured constructs form a part of the overall structural model designed. There is a significant amount of complexity in the structural model, that is, it contains many constructs and indicators. The sample size is considered small and/or the data are non-normally distributed. There is an intention to use latent variable scores in subsequent analyses.

- Data characteristics

According to Hair et al. (2017), the first category to consider when choosing PLS-SEM is data characteristics. This broad category is divided into four additional subcategories, namely sample size, distribution of the data, missing values and scale of measurement.

One of the main advantages of PLS-SEM identified in the literature is its ability to handle small sample sizes. It has been used primarily by researchers who have not been able to obtain the minimum sample required for CB-SEM, and there are also other model-related complexities (Hair et al., 2011; Hair et al. 2012; Hair et al., 2017; Willaby et al., 2015).

The most cited rule for establishing the required sample size for PLS-SEM is the 10 times rule (Barclay et al., 1995; Hair et al., 2017). In this rule, the guideline is that the sample size required for the use of PLS-SEM should be the greater of 10 times the largest number of formative indicators used to measure a single construct, or 10 times the largest number of structural paths directed at a particular construct in the structural model. Hair et al. (2017), however, also provided guidance that in addition to the 10 times rule, the required sample size for PLS-SEM should be based on the requirements for regression. In terms of these requirements, specific sample sizes are indicated, depending on the nature of the research. The sizes are provided in table 6.4, as per Cohen’s (1992) and Goodhue et al’s. (2011) proposed guidelines.

**Table 6.4**

*Sample Guidance Based on Number of Independent Variables*

Maximum Number of Arrows Pointing at a Construct (Number of Independent Variables)	Significance Level											
	10%				5%				1%			
	Minimum R squared				Minimum R squared				Minimum R squared			
	0.1	0.25	0.5	0.75	0.1	0.25	0.5	0.75	0.1	0.25	0.5	0.75
2	72	26	11	7	90	33	14	8	130	47	19	10
3	83	30	13	8	103	37	16	9	145	53	22	12
4	92	34	15	9	113	41	18	11	158	58	24	14
5	99	37	17	10	122	45	20	12	169	62	26	15
6	106	40	18	12	130	48	21	13	179	66	28	16
7	112	42	20	13	137	51	23	14	188	69	30	18
8	118	45	21	14	144	54	24	15	196	73	32	19
9	124	47	22	15	150	56	26	16	204	76	34	20
10	129	49	24	16	156	59	27	18	212	79	35	21

*Note.* Sample Guidance Based on Number of Independent Variables. From A power primer, by Cohen, 1992, *Psychological Bulletin*, 112, pp. 155–159.

Using the guidance provided by Cohen (1992) and Goodhue et al. (2011), the researcher can establish what the specific sample size requirements are for the number of independent variables in the model with different significance levels and minimum R squared. Based on the above guidance, it was determined that the sample size ( $n = 118$ ) obtained for the research would be sufficient for the purposes of conducting PLS-SEM analysis, specifically at the 10% and even the 5% significance levels. The determination of the sample being sufficient for PLS-SEM was completed by determining the number of independent variables in the model using the highest number of arrows pointing at an endogenous construct. The result was the identification of three independent variables. In line with Hair et al.'s (2017) guidance that the 5% significance level is the benchmark for PLS-SEM analysis and that of Cohen for this significance level and R squared value of 0.1, it was determined that a minimum sample of 103 would be required. As the researcher had a sample of 118, this was deemed to meet the requirements.

In their article, Goodhue et al. (2012) cautioned researchers that it is necessary to ensure an adequate sample size when using PLS-SEM. They go on to indicate that several research studies they had reviewed referred only to the "10 times rule" to provide an explanation of their sample sizes without any other consideration. They added that PLS-SEM is also impacted by sample size, and the greater the sample size, the better the results of the analysis will be. It is therefore necessary to ensure that the sample size matches the analysis to be completed using PLS-SEM. This was applied in the current research by utilising the 10-time rule identified in the literature in addition to the guidance provided by Cohen (1992), who provides details of the required sample size needed for significant statistical analysis. Using Cohen's (1992) guidance, the number of independent variables was utilised in addition to the significance levels and the R squared values at each significance level to determine the required sample needed. The details are provided in table 6.4 above. Using the information, the researcher determined that with three independent variables in the model created, the sample of 118 was sufficient for the PLS-SEM analysis at the 5% significance level for an R squared value of 0.1.

For distribution requirements, PLS-SEM has no assumptions and can handle non-normal data. Another consideration is missing values, and these can be dealt with robustly if they are below a certain level. For the scale of measurement, PLS-SEM works with many forms of data and only has some limitations for categorical data used to measure endogenous latent variables (Hair et al., 2017; Henseler et al., 2016; Risher & Hair Jr, 2017; Willaby et al., 2015). This was applied to the research because the data collected was identified as non-normal, the sample utilised only had complete responses and hence no missing data, and the scale used was a Likert type, which meant that the data was suitable for PLS-SEM analysis.



- Model characteristics

The next category to be considered, according to Hair et al. (2017), is the characteristics of the model, and it can be subdivided into four additional subcategories. The first is the number of items in each construct measurement model, the second the relationships between constructs and their indicators, the third model complexity and the fourth, the model set-up. This was applied to the research in a review of the reflective model designed, and the researcher determined that, in line with the guidance provided by Hair et al. (2017), the model was suitable for PLS-SEM analysis.

For the number of items PLS-SEM can handle, constructs are measured using multiple items and a single item. Reflective and formative measurement models can both be accommodated. A model that is complex and has many structural relationships can be managed, but not ones with causal loops – that is, no circular relationships can be accommodated in the structural model. This was applied to the research by reviewing the number of items for each construct and determining that they were suitable for PLS-SEM analysis. Since there were constructs with multiple and single items, the model designed was determined to be reflective and could therefore be analysed using PLS-SEM. Owing to the fact that the model also had several relationships specified with no causal loops, PLS-SEM could be utilised.

- PLS-SEM algorithm

According to Hair et al. (2017, p. 43), the PLS-SEM algorithm has the following properties: (1) it minimises the amount of unexplained variance; (2) it converges after a few iterations to the optimum solution and is an efficient algorithm; (3) the constructs are viewed as proxies of the latent concept under investigation, represented by the composite variables; (4) construct scores are estimated as linear combinations of their indicators, are determinate, used for predictive purposes, can be used as input for subsequent analysis and are not affected by data inadequacies; and (5) parameter estimates of the structural model relationships are generally underestimated and measurement model relationships generally overestimated when estimating data from common factor models, consistency at large and high levels of statistical power.

The above key elements of the algorithm are critical for consideration before researchers decide to use PLS-SEM for their analysis.

- Model evaluation issues

Standard CB-SEM has a significant reliance on goodness-of-fit, whereas there are no standard goodness-of-fit criteria when using PLS-SEM. However, measures have been proposed such as the SRMR to provide an indication of the model fit, but its use should be considered with extreme caution (Hair et al., 2019). This is an area that still requires additional research and validation and should therefore not be the primary focus of the model, but rather its predictive power (Hair et al., 2017).

- Overall model assessments

There are two distinct stages when assessing models using PLS-SEM. The first involves the measurement model and the second an assessment of the structural model (Hair et al., 2017; Hair et al., 2019; Hensler et al., 2016; Risher & Hair Jr, 2017). The items to be assessed and the criteria to be used as proposed by Hensler et al. (2016) are depicted in table 6.5.

**Table 6.5**

*Overall Model Criteria to Use for Evaluation*

Assessment	Criterion
<b>Overall model</b>	
Test of model fit (estimated model)	SRMR < 95% bootstrap quantile (HI95 of SRMR) duls < 95% bootstrap quantile (HI95 of duls) dg < 95% bootstrap quantile (HI95 of dg)
Approximate model fit (estimated model)	SRMR < 0.08
<b>Measurement Model</b>	
Confirmatory composite and/or factor analysis (saturated model)	SRMR < 95% bootstrap quantile (HI95 of SRMR) duls < 95% bootstrap quantile (HI95 of duls) dg < 95% bootstrap quantile (HI95 of dg)
Approximate model fit (saturated model)	SRMR < 0.08
Internal consistency reliability	Dijkstra Henseler's pa > 0.7 Dillion Goldstein's pc > 0.7 Cronbach's alpha > 0.7
Convergent validity	AVE > 05
Discriminant validity	HTMT significantly smaller than 1 Fornell-Larcker criterion Loadings exceed cross-loadings
<b>Structural model</b>	
Endogenous constructs	R squared, adjusted R squared
Direct effects	Path coefficient (absolute size, sign) Significance (p-value, confidence interval) Effect size
Indirect effects	Coefficient (absolute size, sign) Significance (p-value, confidence interval)
Total effects	Coefficient (absolute size, sign) Significance (p-value, confidence interval)

*Note.* Overall Model Criteria to Use for Measurement and Structural Model Evaluation. From Using PLS path modelling in new technology research: updated guidelines, by Henseler et al., 2016, *Industrial Management and Data Systems* 116(1), p. 11. (10.1108/IMDS-09-2015-0382)

Based on the guidance provided in table 6.5 as proposed by Henseler et al. (2016) and by Hair et al. (2017), several of the criteria were used in the assessment of the overall model fit, the measurement and structural models. The SRMR value, specifically the saturated value, was used in the evaluation of the model fit, but was not the primary criterion used to assess its suitability for the purposes of the research. The primary criteria used for analysis and assessment of the measurement and structural models were as follows:

### **Measurement model**

The measurement model was assessed using internal consistency, convergent validity, and discriminant validity. Internal consistency reliability was assessed using the composite reliability values. The benchmark values proposed by Hair et al. (2017) were used for the assessment, specifically any value within the range 0.6 to 0.95.

Convergent validity was assessed using the indicator loadings and average variance explained (AVE) values. The benchmarks proposed by Hair et al. (2019) were used, namely 0.5 and higher for the AVE and the indicator loadings on their construct being 0.708 or higher. Discriminant validity was assessed using the HTMT values. The benchmark proposed by Hair et al. (2017), Hair et al. (2019) and Henseler et al. (2016) was applied, namely 0.9 for constructs that are conceptually similar and 0.85 for constructs that are conceptually distinct.

### **Structural model**

The structural model was assessed using several criteria and sets of results and values. Each of these assessment criteria has been discussed in more detail in this section.

Collinearity was the first criteria to be assessed for the structural model, and the VIF values for the constructs were used. The benchmark proposed by Hair et al. (2011) was used, namely any value above 3 indicating a critical level of collinearity and hence there being an issue with the construct. Direct effects were assessed using the path coefficients, significance values and t values. The benchmark values proposed by Hair et al. (2017) were applied for path coefficients when interpreting the effect size values closer to 1 indicating stronger relationships, significance levels were assessed at  $p < 0.05$ , and t values of 1.96 and above were used at the 5% significance level.

Endogenous variables were reviewed using the coefficient of determination R squared values. The benchmark proposed by Henseler et al. (2016) of values closer to 1 indicating higher levels of predictive accuracy for the constructs was used to evaluate the results. The total effects of the constructs were assessed with the path coefficient values to determine effect sizes between the constructs and the benchmark proposed by Cohen (1988) – that is, 0.1, 0.3 and 0.5 were used for evaluation indicating a small, medium and large effect. The f squared values were also used to assess the removal of the exogenous constructs on the endogenous constructs, with the benchmark proposed by Cohen (1992) of 0.02, 0.15 and 0.35 being used to assess small, medium, and large effects.

The predictive relevance of the model was assessed using the Q squared results, and the benchmark proposed by Hair et al. (2017) of a value exceeding 0 indicating predictive relevance was used to evaluate the output

The focus for the overall assessment of the model based on the criteria discussed above was the model's predictive capabilities. The other criteria used for assessment of the models discussed

above are explained in greater detail in the sections below dealing with the steps involved in reviewing the measurement and structural models.

Once the criteria for assessing the overall, measurement and structural models had been identified, the type of measurement model needed to be chosen for the research. This is discussed in detail in the next section.

- Measurement model assessment

Depending on the type of model selected, PLS-SEM has different means for assessing the measurement model. There are two types of measurement models in PLS-SEM. The first is a reflective model and the second a formative measurement model. A reflective measurement model measures the effects of underlying constructs with all the indicator items of a construct being caused by that construct – hence the need for the indicators to be highly correlated with one another. The indicators should also be interchangeable with any one item being left out, which then does not change the meaning of the construct it was meant to provide an indication of. By contrast, a formative measurement model is based on a causal relationship between the indicators and the construct with the indicators not being interchangeable (Hair et al., 2017).

To assist researchers in deciding which type of model is best for their research, Hair et al. (2017) provided guidelines on several criteria that can be used to assist decision making, as indicated in table 6.6. Once the criteria had been reviewed and considered against the research objectives, the following decisions were made: Casual priority between the indicator and the construct was decided as being from the construct to the indicators because the indicators identified in the literature were impacted by the underlying construct – for example, organisational commitment would result in lower absenteeism. The constructs in the model were identified as traits explaining the indicators. The indicators represented the consequences of the construct. If the assessment of the trait were to change, then all the items would change in a similar manner. The items were identified as mutually interchangeable as they were identified in the literature and phase 2 of the research as possible indicators of the constructs. Hence there could be other indicators.

**Table 6.6**

Criteria to Choose the Measurement Model Type

Criterion	Decision	Reference
Causal priority between the indicator and the construct	<ul style="list-style-type: none"> <li>• From the construct to the indicators: reflective</li> </ul>	Diamantopoulos and Winklhofer (2001)

	<ul style="list-style-type: none"> <li>From the indicators to the construct: formative</li> </ul>	
Is the construct a trait explaining the indicators or rather a combination of the indicators?	<ul style="list-style-type: none"> <li>If trait: reflective</li> <li>If combination: formative</li> </ul>	Fornell and Bookstein (1982)
Do the indicators represent consequences or causes of the construct?	<ul style="list-style-type: none"> <li>If consequences: reflective</li> <li>If causes: formative</li> </ul>	Rossiter (2002)
Is it necessarily true that if the assessment of the trait changes, all the items will change in a similar manner (assuming they are equally coded)?	<ul style="list-style-type: none"> <li>If yes: reflective</li> <li>If not: formative</li> </ul>	Chin (1998)
Are the items mutually interchangeable?	<ul style="list-style-type: none"> <li>If yes: reflective</li> <li>If no: formative</li> </ul>	Jarvis, MacKenzie, and Podsakoff (2003)

*Note.* Criteria to Assist the Researcher in Choosing the Correct Measurement Model Type. From *A primer on partial least squares structural equation modelling (PLS-SEM)* (2<sup>nd</sup> ed.) (p. 76), by Hair et al., 2017, Sage.

Using the criteria proposed by Hair et al. (2017) in table 6.6, in conjunction with the research aims of the study, a reflective measurement model was chosen. Once the type of measurement model had been decided on, the criteria with which to evaluate it needed to be confirmed. The main criteria to assess the reflective measurement and structural models were initially explained when discussing the overall model assessment earlier in this chapter, and are covered in greater detail in the sections to follow.

- Reflective measurement model assessment

The first stage of the PLS-SEM assessment involves an analysis of the measurement model. This is typically divided into four distinct steps. The first is a review of the indicator loadings as part of convergent validity, the second a review of internal consistency reliability, the third an assessment of the convergent validity and the fourth a review of discriminant validity (Hair et al., 2017; Hair et al., 2019; Hensler et al., 2016; Risher & Hair Jr, 2017; Wong, 2013).

Wong (2013) provides an overview of what needs to be checked specifically from a reliability and validity perspective when conducting PLS-SEM for measurement models, as depicted in table 6.7.

**Table 6.7**

*Reliability and Validity Criteria from SmartPLS*

What to check?	What to look for in SmartPLS	Where is it in the report?	Is it OK?
<b>Reliability</b>			
Indicator Reliability	*Outer loadings* numbers	PLS – Calculation Results – Outer loadings	Square each of the outer loadings to find the indicator reliability value  0.70 or higher is preferred. If it is exploratory research 0.4 or higher is acceptable (Hulland, 1999)
Internal Consistency Reliability	“Reliability” numbers	PLS – Quality Criteria – Overview	Composite reliability should be 0.7 or higher. If it is exploratory research 0.6 or higher is acceptable (Bagozzi and Yi, 1988)
<b>Validity</b>			
Convergent Validity	“AVE” numbers	PLS – Quality Criteria – Overview	It should be 0.5 or higher (Bagozzi and Yi, 1988)
Discriminant Validity	“AVE” numbers and Latent Variable Correlations	PLS – Quality Criteria – Overview (for the AVE number as shown above)  PSL – Quality Criteria – Latent Variable Correlations	Fornell and Larcker (1981) suggest that the “square root” of AVE of each latent variable should be the greater than the correlations among the latent variables

*Note.* Reliability and Validity Criteria to be used to Assess the Models with SmartPLS. From Partial least squares structural equation modeling (PLS-SEM), by Wong, 2013, *Marketing Bulletin*, p. 21.

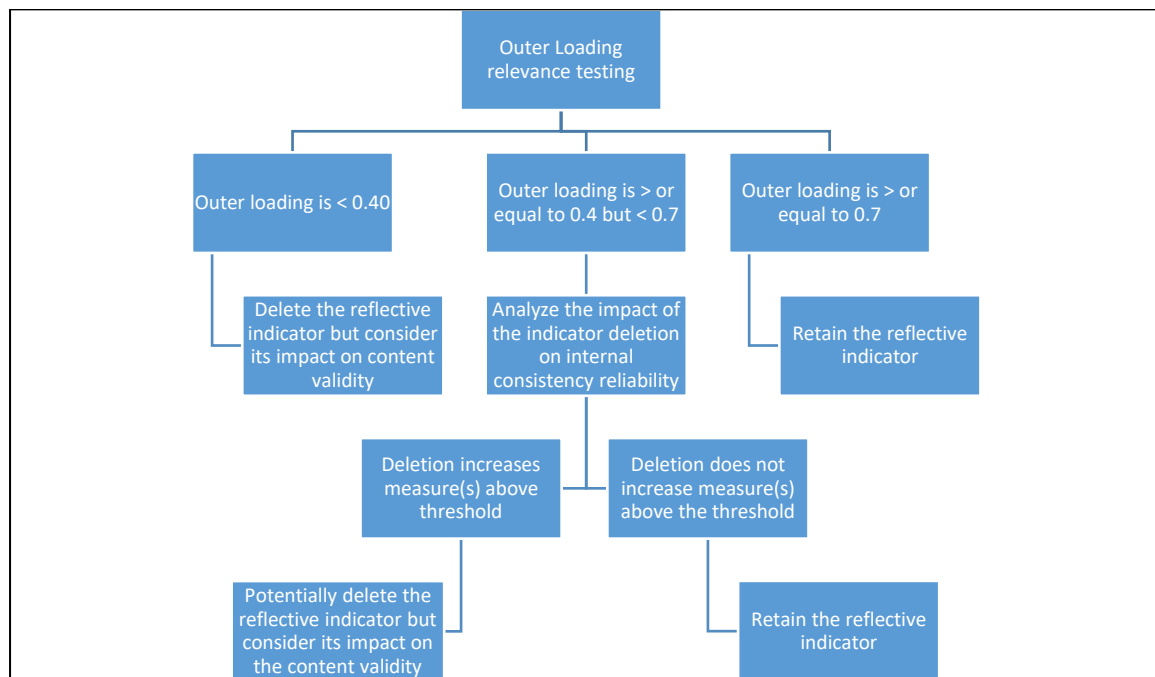
Indicator loadings are the first item to be reviewed when assessing the reflective measurement model (Hair et al., 2019). The guideline provided is that the outer loadings calculated should be 0.708 or higher for a construct to explain 50% or more of an indicator’s variance. This would therefore provide an acceptable indication of the item’s reliability (Hair et al., 2017; Hair et al., 2019; Risher & Hair Jr, 2017). However, Hair et al. (2017) and Wong (2013) suggested that if the outer loading of an item is between 0.4 and 0.7, careful consideration should be given before it is removed in terms of whether or it will increase the internal consistency reliability, and what the impact will be on the construct’s content validity. If an item is below 0.4, then deletion is recommended, but the impact on content validity must again be considered. This was applied to the current research as the indicator loadings for each construct were reviewed to determine if the proposed constructs explained 50% of the variance for the proposed indicators and were equal to or above the 0.708 benchmark value proposed by Hair et al. (2019). This was the first of two evaluation criteria used to

assess the measurement model's convergent validity. The results of the indicator loadings are explained in detail in section 8.8.1.1 in chapter 8.

This was applied in the current research, as several indicators initially proposed for constructs in the model had to be removed owing to the fact that the indicator loading values were less than 0.4. These were removed to enhance the AVE and composite reliability values of the constructs, as per Hair et al.'s (2017) guidance. This is explained in detail in section 8.9 in chapter 8. Other indicators above 0.4 but below the 0.708 threshold were also identified during the PLS-SEM analysis. However, these indicators were retained owing to the composite reliability values of the constructs being above the benchmark values of 0.7 required and the strong theoretical foundation for the indicators. This is explained in greater detail in section 8.8.1.1 in chapter 8. The summary of the decision-making process for item loadings and the considerations that were made is provided in figure 6.4.

**Figure 6.4**

*Outer Loading Relevance Testing*



*Note.* Outer Loading Relevance Testing. From *A primer on partial least squares structural equation modeling (PLS-SEM)* (p. 138), by Hair et al., 2017, Sage.

The next step in the assessment of the measurement model is the analysis of internal consistency reliability. This step looks specifically at the composite reliability of the constructs with values of between 0.6 and 0.7 being acceptable for exploratory research. However, in situations where research is more advanced, values of between 0.7 and 0.9 are acceptable. Values of 0.95 and above



are considered an issue and reduce construct validity (Hair et al., 2017; Hair et al., 2019; Risher & Hair Jr, 2017; Wong, 2013).

The third step in the measurement model assessment is to review the convergent validity of the model. This has been defined as “the extent to which a measure correlates positively with alternative measures of the same construct” (Hair et al., 2017, p. 137). The two main components of convergent validity, according to Risher and Hair Jr (2017), are item loadings and average variance extracted (AVE). Item loadings were discussed as the first step in the measurement model assessment, and the AVE is now discussed with a value of 0.5 or higher being proposed as acceptable (Hair et al., 2017; Hair et al., 2019; Henseler et al., 2016; Wong, 2013). Sahmer et al. (2006), however, proposed a more liberal view of the cut-off for AVE where they advised, firstly, that evidence could be found for unidimensionality as long as the factor was able to explain more variance than the second factor extracted from the same indicators, and secondly, that each pair of factors used for theoretically different constructs should also be statistically significant. If a construct has only one item, then AVE is not an appropriate measure as the value would be 1.0 (Hair et al., 2017). This was applied to the current research because each of the constructs was then reviewed against the proposed AVE benchmark value of 0.5 recommended by Hair et al. (2017). The AVE was the second of two evaluation criteria used to assess convergent validity to determine if there were any issues in the measurement model. The results for the AVE are discussed in detail in section 8.8.1.2 in chapter 8.

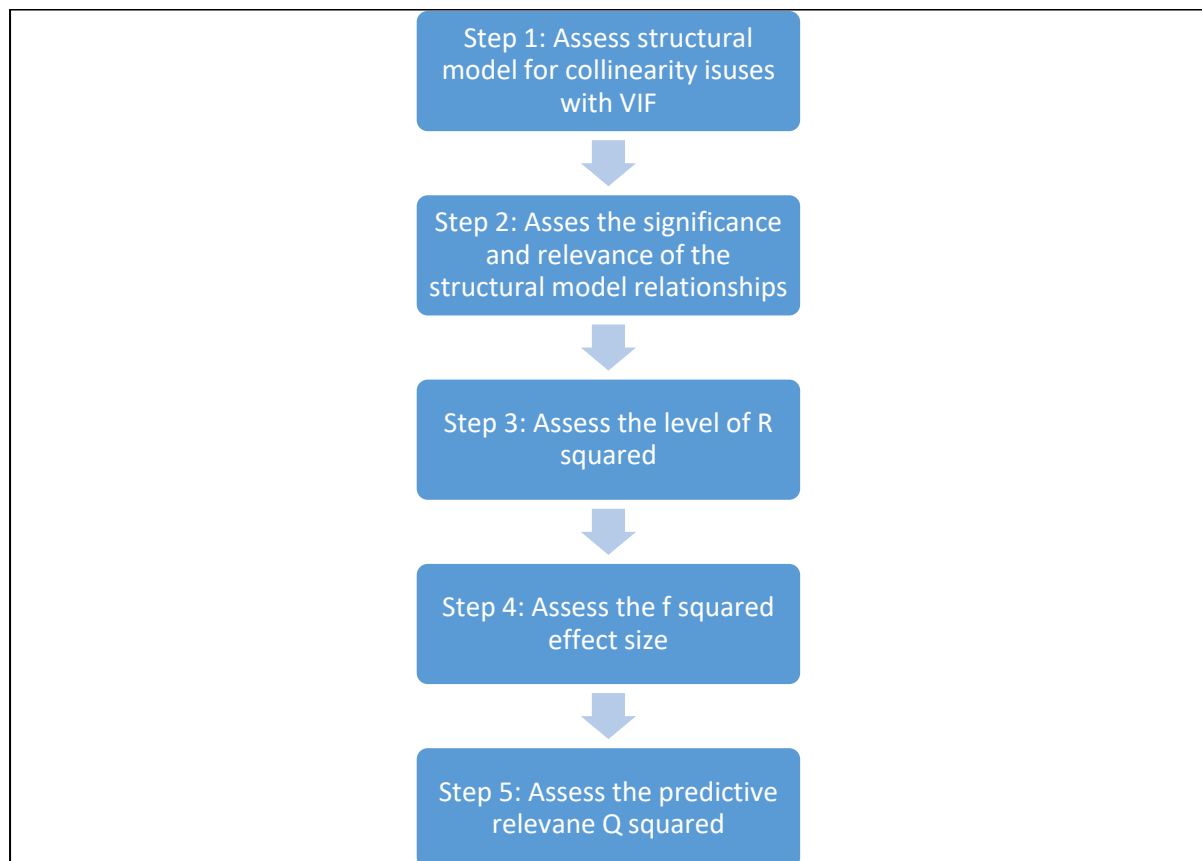
The final step in the measurement model assessment process is discriminant validity. This step reviews to what extent the constructs are different from other constructs (Hair et al., 2017). There are typically three measures for discriminant validity, namely the Fornell-Larker criterion, cross-loadings and the heterotrait-monotrait ratio (HTMT) (Risher & Hair Jr, 2017). In recent years, the Fornell-Larker criterion and cross-loadings have been found to be unsuitable for discriminant validity assessment, with the HTMT being identified as being more suited to establishing discriminant validity (Hair et al., 2017). HTMT values of significantly less than 1 were proposed by Henseler et al. (2016) as acceptable. Bootstrapping analysis is also conducted to assess the HTMT at the 95% confidence interval, to assess values less than 1.0 or against other thresholds of 0.85 for exploratory or 0.9 for conceptually similar constructs, depending on the context of the study (Hair et al., 2019). This was applied to the current research as each construct was evaluated against the benchmark values proposed using the HTMT and bootstrapping results at the 95% confidence intervals to determine if there were any issues with discriminant validity. The results of this analysis are discussed in detail in section 8.8.1.3 in chapter 8.

- Structural model assessment

Once the analysis of the measurement model has been completed and the necessary requirements have been met, the structural model needs to be assessed. This model was assessed in five steps as proposed by Hair et al. (2017), and illustrated in figure 6.5.

**Figure 6.5**

*Structural Model Evaluation Steps*



*Note.* Steps Proposed to Evaluate the Structural Model with PLS-SEM. From *A primer on partial least squares structural equation modeling (PLS-SEM)* (p. 200), by Hair et al., 2017, Sage.

The first step described in assessing the structural model is to review the variance inflation factor (VIF) for any issues of collinearity. To assess the results provided, it is recommended that ideal VIF values should be close to or lower than 3 to provide evidence that collinearity is not a problem between the constructs (Hair et al., 2011; Hair et al., 2017; Hair et al., 2019; Wong, 2013).

The next step in the structural model assessment is the review of the model path coefficients (b). These values are assessed on the basis of the distance they are from 0, with the further away they are, the stronger the relationship, and the closer they are, the weaker the relationship (Hair et al., 2017; Henseler et al., 2016). Path coefficients are further analysed using the bootstrapping analysis

available with SmartPLS, which focuses on generating results of t-values at different levels of two-tailed significance levels (0.01, 0.05 and 0.1), with the t-values being used to indicate the significance of the relationships being equal to and above 2.57, 1.96 and 1.65 respectively. For studies that have a specific interest in identifying the sum of the direct and indirect effects that driver constructs in a model have on other constructs, the total effect output provided in SmartPLS is particularly useful for review and interpretation (Hair et al., 2017). The total effects output and the identification of the driver constructs for the model created and the total effects they have, are explained in detail in the results discussion in section 8.8.2.2 in chapter 8.

One of the main criteria used to evaluate the structural model is the R squared values which indicate the degree to which the endogenous construct's variance is explained by the exogenous constructs and represents the in-sample predictive power (Henseler et al., 2016; Hair et al., 2017). Values range from 0 to 1, with the greater the value, the more of the endogenous construct it explains. Guidelines provide by Hair et al. (2019) are that values of 0.25, 0.5 and 0.75 can be considered weak, moderate and substantial. The adjusted R squared value can be used to avoid bias associated with complex models (Hair et al., 2017).

Once the coefficient of determination has been reviewed, the F squared value can then be used to evaluate the impact of removing a specific exogenous construct from the model and how much it contributes to the endogenous construct (Hair et al., 2017; Wong, 2013). F squared effect sizes of 0.02, 0.15 and 0.35 can be described as weak, moderate and substantial, with effect sizes below 0.02 being described as having no effect (Cohen, 1988; Goodhue et al., 2011).

The next step in the evaluation of the structural model is blindfolding and the use of the predictive relevance Q squared, which is used to provide an indication of the model's out-of-sample predictive power (Hair et al., 2019). Values larger than 0 for the endogenous constructs indicate the model's predictive relevance for these constructs. According to Hair et al. (2017), there are two approaches that can be used to calculate the Q squared value, namely cross-validated redundancy and cross-validated communality, with the former being identified as most suitable for the purpose of PLS-SEM. This approach was chosen for the calculation in this study and is discussed in detail in chapter 8.

Another means to evaluate the structural model, in addition to the steps proposed by Hair et al. (2017), is the use of the SRMR value calculated in version 3 and above of SmartPLS. According to Hu and Bentler (1999) and Wong (2013), an SRMR value of 0.08 and 0.09 was acceptable in rejecting misspecified models. They also suggested that values of less than 0.1 or 0.08 for a more conservative view were acceptable. As discussed earlier in this section, extreme caution should be exercised

when reviewing the SRMR value for model fit owing to the limited amount of research currently available (Hair et al., 2017). It was decided to present the results of the SRMR output for the overall model fit in order to provide a complete view of the different criteria used for model evaluation as identified in the literature, and discussed in section 8.8.2.6 in chapter 8. The SRMR, however, was not the primary means for assessment of the model, with the focus being on the results that provide an indication of its predictive power and the identification of driver constructs.

## 6.8 Research hypotheses

A critical aspect of the research conducted in achieving the aims specified was to formulate and test hypotheses. The hypotheses formulated for the study, the research objectives and the statistical methods applied are set out in table 6.8.

**Table 6.8**

*Research Objectives, Research Hypotheses and the Statistical Methods Applied*

Research objectives	Research hypotheses	Statistical methods applied
To develop a valid and reliable questionnaire to measure the need for the use of HRIS data and organisational success factors	<b>Hypothesis 01:</b> A statistically significant questionnaire to measure the need for the use of HRIS data and measure the measures of organisational success factors and the factors themselves can be developed.	Measurement validity of the instrument used for the research was established as follows: <ul style="list-style-type: none"> <li>• Content validity was confirmed               <ul style="list-style-type: none"> <li>• Construct validity was confirmed</li> </ul> </li> <li>• Face validity was confirmed</li> </ul> A reliability analysis supported by PLS-SEM criteria for reliability and validity was also used.
	<b>Hypothesis a1:</b> A statistically significant questionnaire to measure the need for the use of HRIS data and measure the measures of organisational success factors and the factors themselves cannot be developed.	
To measure the constructs of HRIS, organisational culture, leadership, internal organisational processes and other constructs extracted from models on organisational performance and determine their key components	<b>Hypothesis 02:</b> The constructs of HRIS, leadership, organisational culture, internal organisational processes and other constructs extracted from organisational performance models can be determined, and their key components can be measured.	PLS-SEM analysis outputs specifically, internal indicator loadings of the indicators on their assigned construct, internal consistency reliability, convergent and discriminant validity, item cross-loadings and composite reliability were used as the primary analysis to evaluate the model supported by reliability analysis.
	<b>Hypothesis a2:</b> The constructs of HRIS, leadership, organisational culture, internal organisational processes and other constructs extracted from organisational performance models cannot be	

	determined, and their key components cannot be measured.	
To determine and test the empirical relationship between the construct HRIS and measures based on organisational success factors.	<b>Hypothesis 03:</b> The empirical relationship between the construct HRIS and measures based on organisational success factors can be determined and tested through statistical analysis.	<ul style="list-style-type: none"> <li>• Agreement level and mean for item 15.6, "Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation"</li> <li>• Path coefficients between the constructs</li> <li>• Bootstrapping confidence intervals for path coefficients between the constructs</li> <li>• Total effects of the driver constructs</li> </ul>
	<b>Hypothesis a3:</b> The empirical relationship between the construct HRIS and measures based on organisational success factors cannot be determined and tested through statistical analysis.	
To assess whether biographical variables play a moderating role in the use of HRIS.	<b>Hypothesis 04:</b> There will be a significant difference between the biographical variables in moderating the use of HRIS to derive metrics and the measurement of organisational success factors.	One-way ANOVA between groups with post hoc tests
	<b>Hypothesis a4:</b> There will be no significant difference between the biographical variables in moderating the use of HRIS to derive metrics and the measurement of organisational success factors.	
To develop and test an empirical model for HRIS and measures by means of structural equation modelling.	<b>Hypothesis 05:</b> An empirical model for HRIS and measures can be created and tested using structural equation modelling on organisational success factors.	PLS-SEM measurement and structural model results
	<b>Hypothesis a5:</b> An empirical model for HRIS and measures cannot be created and tested using structural equation modelling on organisational success factors.	

## 6.9 Chapter summary

This chapter covered the research methodology followed for this study. The first section focused on the aim of the study, mixed methods as the method chosen for the research, the rationale for using it, the different types that can be used and the type selected for the study. The second section dealt with the qualitative research phase of the research and the third focused on the quantitative phase of the research. The chapter concluded with the research hypotheses formulated for the research, along with the initial empirical aims and how they would be tested statistically.

Chapter 7 deals with the qualitative data analysis where the results and findings are presented, as well as the refinement of the conceptual model from the second phase of the research. The chapter concludes with a discussion of the overall themes and subthemes deemed significant by the researcher.

## Chapter 7: Reporting and Interpretation of Qualitative Results

This chapter deals with the findings of the second phase of the research, specifically the qualitative study. The research participants, the data collection and analysis strategy are discussed. At the end of the chapter the themes and most notable subthemes identified in the data analysis are presented and explained.

### 7.1 Introduction

A key aim of the research was the establishment of a model of organisational success factors (OSFs) correlated to organisational success that could be drawn using data from an organisation's HRIS. The aims of the qualitative phase of the research were as follows:

- To determine their use of HRIS data
- To determine their view of the conceptual model with the possible list of OSFs and their measures created
- To determine if there were any additions to, removals from and/or enhancements to the OSFs and their measures

Based on a review of the literature, the research was conducted once the conceptual model had been designed. The phenomenological research method was utilised with multiple participants (n = 8). The qualitative phase of the research contributed to these objectives by questioning participants in order to gain a better understanding of the general need to use HRIS data and how they used it, and to obtain their perspective on the conceptual model created on the basis of the literature, as well as any improvements and enhancements that could be made.

This phase of the research additionally allowed for a greater understanding of specifically selected participants' insights, experiences and knowledge on the focus of the overall research. This enhanced the conceptual model created and provided a better understanding of the data used by the participants in their interventions, as well as some of the challenges they experienced with the HRIS data used. The refinements made to the conceptual model based on the results are discussed later in this chapter in section 7.6.1.

Data was gathered using semi-structured interviews comprising mainly open-ended questions, except in instances where a "yes" or "no" answer was required. There are several advantages to

utilising semi-structured interviews. They are useful when participants in the study cannot be directly observed. Historical information can be obtained from the participants and the researcher is able to control the questions asked (Creswell, 2009; Teddlie & Tashakorri, 2009).

A questionnaire was created specifically using a funnel approach whereby broader questions were asked at the beginning of the interview, with the questions then becoming gradually more specific to solicit answers to the research questions. The following questions were asked:

### Section 1

- 1.) What organisational development approaches do you follow when developing interventions at the individual, team and organisational levels to assist your or your client's organisations?
  - a. Which approaches do you use more regularly?
    - i. Why do you prefer these approaches?
    - ii. What are their advantages over other approaches?
  - b. What other approaches have you used in the past but have not used regularly?
    - i. Why do you not use them more often/regularly?
    - ii. Any limitations in these approaches?
- 2.) What sources of data and information do you use to assist you? (Interviews, workshops, policies, etc.)
  - a. Do you use structured vs less structured data? (I.e. obtrusive = interviews, workshops, etc. vs unobtrusive = review of policies, strategies, documents, archives, historical data, transactional data extracted from databases, etc.)
- 3.) What sources of data and information do you find to be most useful?
  - a. How accessible have this data and information been?
  - b. What structure have the data and information used been in? (structured = reports, lists, etc. vs unstructured = databases)
- 4.) What characteristics make these sources the most useful?
- 5.) What has been your exposure to HRISs in your or your client's organisations?
- 6.) How would you describe your understanding of an HRIS?
- 7.) Do you make use of HRIS data?
  - a. If so, what information do you use?
  - b. Why do you use it?
  - c. How would you describe the quality of the information?
  - d. Are there any ethical considerations that need to be taken into account when using the information?



- 8.) Is there a bigger need to make use of HRIS data in assisting to design interventions at the individual, team and organisational levels?
  - a. If so, where do you think HRIS data could add the greatest value?

## Section 2

### Questions:

- 1.) What is your general view of the possible list of organisational success factors identified from the literature, based on your experience?
  - a. What is your general view on the link between the possible list of OSFs and organisational success?
- 2.) Are there any changes, additions or removals you believe are required, based on your experience?
- 3.) Can the factors in the model be predicted using data extracted from an organisation's HRIS or similar system?
- 4.) Is there any additional information stored on an organisation's HRIS that could be used for this process that has not been included in the model?

The semi-structured interview method does have limitations, such as indirect information being provided from the view of participants. Information is provided in a designated place rather than in the natural setting. The researcher's presence may bias responses and not all people are able to explain their thoughts as well or are as perceptive (Creswell, 2009; 2014).

To mitigate the limitations, the researcher did the following:

- Asked open-ended questions and allowed participants to go into as much detail as they felt was relevant in answering.
- Constantly reiterated during the interviews to the participants that he was not trying to guide the answers and would ask to follow-up questions only to gather more detail or for clarification purposes.
- Used statements such as "if I understand you correctly ..." and "if I heard you properly then you meant ...". These allowed the participants to clarify or correct any misunderstandings on the part of the researcher and therefore improve the quality of the data collected.
- Prepared for the interviews beforehand by going through the questions to be asked and ensuring the same main elements were explained to participants.
- Scheduled interviews when it was convenient for the participants either during or after work.
- Attempted to curb interviewer bias by explaining the reasoning for the interview and assuring the participants that there was no right or wrong answer and that they should only focus on

providing what they felt was the answer to the question. The familiarity that the researcher had with the participants assisted in this regard to ensure that there was trust and confidentiality. Additionally, by working with the participants, the researcher was able to interpret answers and language used specific to the organisation's practices and methods that would not have been known to an outsider.

The participants were interviewed for approximately one hour via Zoom, and each interview was recorded on the application and written notes taken. The recordings were stored on the researcher's Zoom Cloud account that was username and password protected. At the beginning of each interview, the context and background to the research was given, as well as the rationale for requesting the participants' participation. Confidentiality, it was advised, would be ensured in terms of no recording or use of personal information in the research itself. Participants were also encouraged to engage with the researcher if they had any follow-up questions or concerns. At the end of the interviews, the participants were thanked for expressing their views.

## 7.2 Description of participants

The participants in the qualitative study were selected using the purposeful sampling – Criterion – I method, and were a combination of employees in the Human Capital and the Operational Excellence Departments in the organisation (n = 8). The diversity of the participant group was notable, owing to their differences in background, age, experience, management level and education. Unique views were also gained during the interviews that contributed to the overall research and the refinement of the conceptual model. The participants all had tertiary level education with two having diplomas, two degrees, one an honours degree, two a master's degree and one a PhD. Participants had a range of one year eight months' experience to 19 years' experience with the organisation. Two of the participants in the study were executives, four senior managers and two worked at a middle management level. The sample comprised five participants from a division of the organisation based in Pretoria and the other three were from a division based in Isando.

## 7.3 Strategies to enhance the quality of the research

Owing to the subjective nature of qualitative data and its analysis, questions are frequently posed about the validity of the information and its reliability (Cassell & Bishop, 2019; Creswell, 2009; 2014).

Approaches, methods and techniques were formulated to address the concerns of the qualitative analysis process.

The four main components of enhancing the validity and reliability of qualitative data analysis are credibility, transferability, dependability and confirmability. Each of these components and how they were applied in the qualitative analysis phase of the research are discussed below.

### 7.3.1 Credibility

Credibility refers to the comparability between the realities that were observed among the respondents and the realities that exist in the minds of those respondents. Methods to enhance credibility that were used in this study included: Prolonged engagement that entails staying in the research field until the data saturation point has been reached. Peer debriefing meaning that the findings should be discussed with relevant peers who do not find themselves directly involved in the field of study. Referential adequacy relates to the possibility of the researcher being able to prove the existence of the “raw data” that was collected. Examples include audio and video tapes. Member checks during the study involved the researcher returning to the participants to ensure that the data that was collected and the interpretation were correct (Cassell & Bishop, 2019; Lincoln & Guba, 2000).

### 7.3.2 Transferability

Transferability refers to whether the findings can be applied in other contexts or with other respondents. The researcher made all possible attempts to collect sufficiently detailed descriptions of data, also referred to as “thick descriptions”. The researcher indicated that purposive sampling would be used in this study. This, according to Lincoln and Guba (1985) and Cassell and Bishop (2019), enhances trustworthiness. To support thick descriptions, detailed notes were taken during the interviews and the transcripts of the interviews were stored for reference if needed.

### 7.3.3 Dependability

According to Lincoln and Guba (1985) and Cassell and Bishop (2019), there can be no validity without reliability (and thus no credibility without dependability). A demonstration of the former is sufficient to prove dependability.

### 7.3.4 Confirmability

Confirmability relates to the degree to which the findings are the product of the focus of the inquiry and not of the researcher's biases. According to Lincoln and Guba (1985) and Cassell and Bishop (2019), a confirmability audit trail should be left to enable the auditor to determine if the conclusions, interpretations and recommendations can be traced back to their sources, and if they are, supported by the inquiry. To improve confirmability, the researcher kept research notes, reflection notes and all raw data.

### 7.3.5 Role of the researcher

The researcher in qualitative research acts as the primary instrument to review, analyse and interpret information. In this instance, the researcher was responsible for the collection, collation, analysis and interpretation of the data. To minimise any potential bias, the researcher utilised reflective statements and disclaimers to ensure the participants' meanings were understood and that they could provide any answer they felt relevant to the question. The interviews were also conducted via Zoom without cameras on. This meant that the participants and the researcher were not in the same room and could not see one another. This further minimised any potential bias and pressure that participants may have experienced.

## 7.4 Reflective statement on the data analysis process

The data was analysed using thematic content analysis. The process followed was that proposed by Creswell (2009; 2014) and Tashakkori and Teddlie (2010) and is described in detail in the sections below.

### Phase 1: Organising and preparing data for analysis

This step is aimed at ensuring the data are ready for further analysis and may involve the conversion of data from one source to another, such as typing up of fieldnotes into Microsoft Word (Creswell, 2009; Tashakkori & Teddlie, 2010).

Zoom was used for the interviews and has the functionality of being able to provide a transcript of the interview conducted in a text document. The recorded interviews in text were then converted into Microsoft Word for further use and to provide evidence of each interview, where required. The names of the participants were removed from the Microsoft Word versions and replaced with Participant A to Participant H, based on the order in which they were interviewed.

The notes taken during the interviews were typed into Microsoft Word to allow for review and analysis.

### Phase 2: Reading through all the data

The notes taken during the interviews were read to ensure the researcher understood the comments and answers provided. The understanding gained from the answers provided by the participants when read in conjunction with the questions asked proved invaluable in analysing the qualitative data.

### Phase 3: Coding the data

A theoretical approach was used by the researcher in the creation of the initial coding framework using the questions asked during the interviews and the information gathered. The results are contained in table 7.1.

**Table 7.1**

*Initial Coding Framework*

Theme code	Theme description	Subcategories description	Subcategories coding
<b>Section 1</b>			
S1Q011	Organisational development approaches	1.) Multipronged approach	S1Q0111
		2.) Approach determined by goal or context	S1Q0112

		3.) Consultative approach	S1Q0113
		4.) Scientific or data-driven approach	S1Q0114
		5.) Centre-led approach	S1Q0115
S1Q012	Regular approach used	1.) Multipronged approach	S1Q0121
		2.) Approach determined by goal or context	S1Q0122
		3.) Consultative approach	S1Q0123
		4.) Scientific or data-driven approach	S1Q0124
		5.) Centre-led approach	S1Q0125
S1Q013	Regular approach preference	1.) Buy-in	S1Q0131
		2.) Collaboration	S1Q0132
		3.) Holistic view	S1Q0133
		4.) Objective	S1Q0134
S1Q014	Regular approach advantages	1.) Buy-in	S1Q0141
		2.) Collaboration	S1Q0142
		3.) Holistic view	S1Q0143
		4.) Objective focus based on data	S1Q0144
		5.) Diverse information	S1Q0145
S1Q015	Nonregular approach	1.) Research based	S1Q0151
		2.) Team building	S1Q0152
		3.) Prescriptive and top down	S1Q0153
		4.) Opinion-based approach	S1Q0154
S1Q016	Nonregular approach reasons	1.) Use experience	S1Q0161
		2.) No team in place to drive	S1Q0162
		3.) They fail or get less value	S1Q0163
		4.) Lack of buy-in	S1Q0164
		5.) No pressures to use them	S1Q0165
S1Q017	Nonregular approach limitations	1.) Practical application is limited	S1Q0171
		2.) No limitations	S1Q0172
		3.) No buy-in and ownership	S1Q0173
		4.) Availability of participants	S1Q0174
S1Q021	Sources of data	1.) Research material	S1Q0211
		2.) People engagement data	S1Q0212
		3.) System information	S1Q0213
		4.) Hard and soft data	S1Q0214
S1Q022	Obtrusive and unobtrusive data	1.) Both	S1Q0221
		2.) Mainly obtrusive	S1Q0222
		3.) Unobtrusive	S1Q0223
S1Q031	Data sources most useful	1.) Data analytics is a weak area	S1Q0311
		2.) People data	S1Q0312
		3.) System information	S1Q0313
		4.) Research, literature and additional sources	S1Q0314
		5.) Depends on context	S1Q0315
S1Q032	Data sources' accessibility	1.) Not easily accessible	S1Q0321

		2.) Accessible	S1Q0322
		3.) Some data is accessible and other not	S1Q0323
S1Q033	Data sources' format	1.) Structured (reports, publications, lists, presentations)	S1Q0331
		2.) Unstructured (data dumps & social media)	S1Q0332
		3.) Both	S1Q0333
S1Q041	Data characteristics	1.) Summaries in research material	S1Q0411
		2.) It can be analysed	S1Q0412
		3.) Accurate and reputable	S1Q0413
S1Q051	HRIS exposure	1.) Significant exposure	S1Q0511
		2.) Some exposure	S1Q0512
		3.) Not significant exposure	S1Q0513
S1Q061	HRIS understanding	1.) Basic	S1Q0611
		2.) Intermediate	S1Q0612
		3.) Advanced	S1Q0613
S1Q071	HRIS data use	1.) Yes	S1Q0711
		2.) No	S1Q0712
S1Q072	Specific HRIS data used	1.) Demographic and employee associated information	S1Q0721
		2.) Performance and talent data	S1Q0722
		3.) Payroll data	S1Q0723
		4.) Position information	S1Q0724
S1Q073	Reasons for HRIS use	1.) Provides trends, pictures and assists with statistical analysis	S1Q0731
		2.) Inform decisions	S1Q0732
S1Q074	HRIS data quality	1.) Not good or limited	S1Q0741
		2.) Good	S1Q0742
S1Q075	Ethical considerations with HRIS data	1.) Yes	S1Q0751
S1Q081	Bigger need to use HRIS data	1.) Yes	S1Q0811
S1Q082	Greatest value of HRIS data	1.) Slice and dice information	S1Q0821
		2.) Inform decision making and provide insights	S1Q0822
		3.) Team composition for events	S1Q0823
		4.) Career development	S1Q0824
		5.) Compliance and financial benefits	S1Q0825
<b>Section 2</b>			
S2Q011	View of OSFs	1.) Good and reasonably accurate	S2Q0111
		2.) Only shows HC elements	S2Q0112
S2Q012	View of OSFs and organisational success	1.) There is a link	S2Q0121
		2.) Some are direct and others indirect	S2Q0122
S2Q021	Model modifications	1.) Trust and engagement	S2Q0211
		2.) Job content and related factors	S2Q0212

		3.) Defined purpose under transformational leadership	S2Q0213
		4.) Change capability	S2Q0214
		5.) None	SQ20215
S2Q031	OSFs and prediction using HRISs	1.) Yes	S2Q0311
		2.) Some “yes” and others “no”	S2Q0312
		3.) Cannot answer	S2Q0313
S2Q041	Additional HRIS data that can be used	1.) Short- and long-term incentives	S2Q0411
		2.) Onboarding and recruitment data	S2Q0412
		3.) Overtime and leave	S2Q0413
		4.) Learning and knowledge management	S2Q0414
		5.) Nothing specific or a combination of data	S2Q0415

The coding framework was created by using a combination of alpha and numerical information. The first letter and number indicated the section of the questionnaire. The next letter and numbers indicated the question number in the section, and the final two numbers indicated the number of the question in the sequence of questions and the subcategory for the overall question. This is illustrated in table 7.2.

**Table 7.2**

*Coding Creation Breakdown*

Section number	Question number	Subquestion number	Subcategory number
S2	Q04	1	5

The primary source of data used for the coding was the notes taken during the interviews by the researcher. The main reason for this was the specific nature of the questions posed and the tendency of most participants to answer the question and then provide an explanation of the answer given. Additionally, the focus of the qualitative interviews conducted was to gather broad information on the feasibility of utilising HRIS data and then to focus on specific questions about the conceptual model developed on the basis of the literature review.

The researcher compiled an Excel document containing the initial coding framework and a table created for the captured notes taken from each interview, with columns for each participant to assist with the analysis. A separate table was also created to record the participants’ demographic details captured at the beginning of each interview.



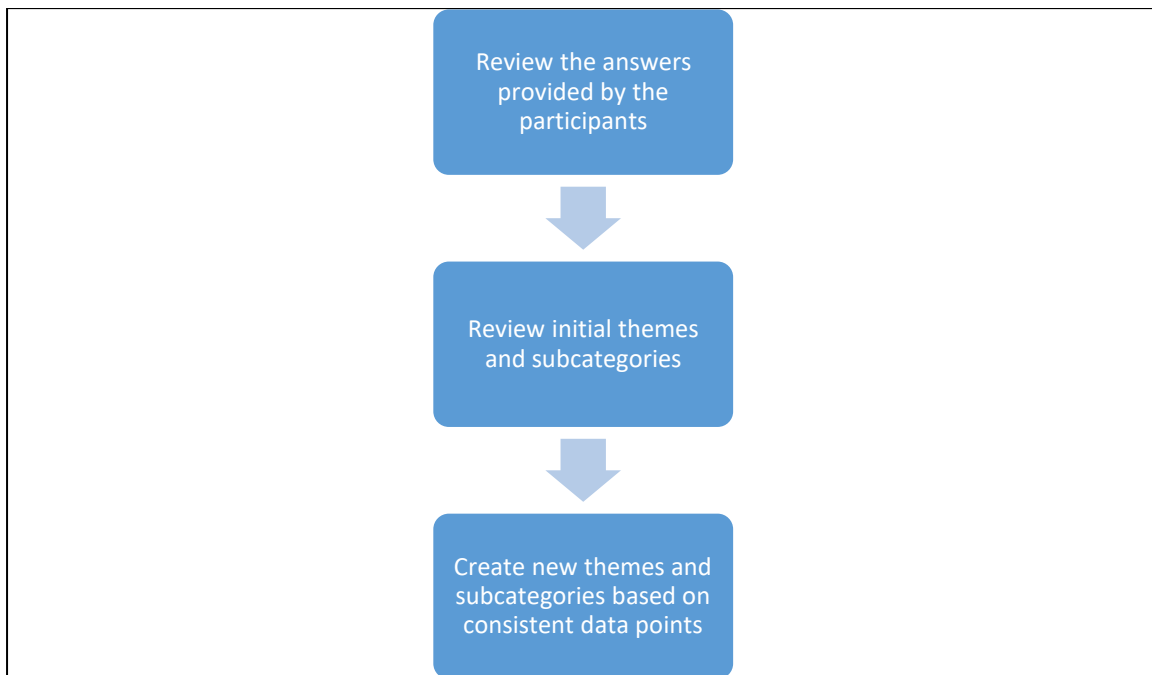
To assist with the data analysis, subcategories were highlighted in different colours, with the corresponding answers provided by participants being highlighted in the same colour as the subcategory. This led to the identification of dominant subcategories in the overall themes. As the researcher went through the data, changes were made to subcategories based on a new understanding of the information provided by each participant in answering the questions.

#### **Phase 4: Themes/descriptions**

For this phase of the qualitative data analysis process, overall themes were identified and created using the questions posed as the primary basis, which were then supported by the participants' answers. As the researcher went through the data, changes were made to subcategories based on a new understanding gained of the information provided by each participant. The process of consolidating the initial themes and creating new ones and subcategories is indicated in figure 7.1.

**Figure 7.1**

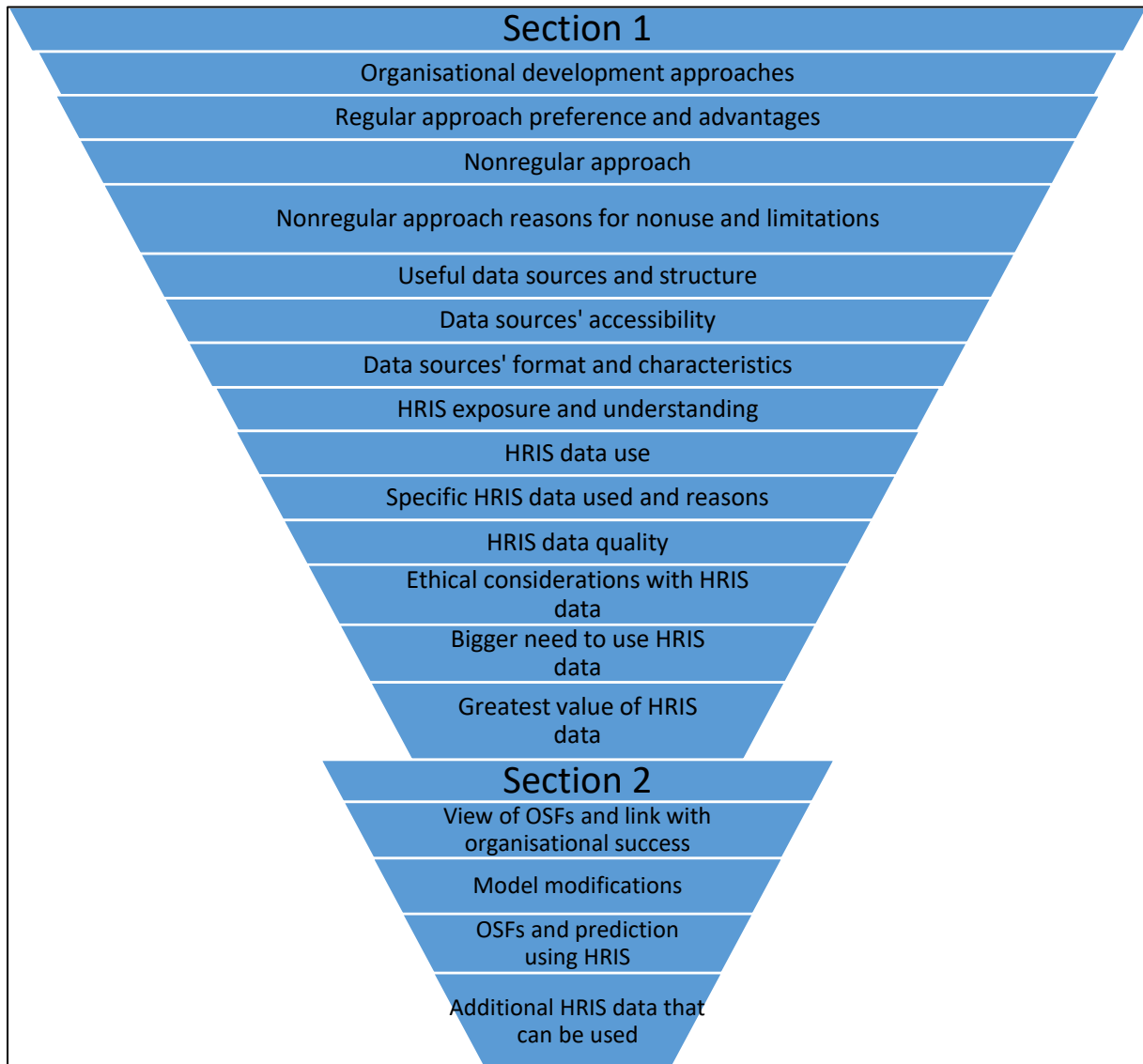
*Theme Creation Process*



Owing to the nature of the qualitative phase of the research and the primary aims of ascertaining the need to use HRIS data and to review and refine the conceptual model created, the list of initial themes contained in table 7.1 above was largely retained. The reason for this was the distinct focus of many of the questions posed, and the researcher's belief that combining them into larger and

more general themes would result in a loss of the important information participants had provided in answering the questions. The results of the thematic creation process provided in figure 7.2 identify the themes in sections 1 and 2 of the questionnaire.

**Figure 7.2**  
*Theme Map*



**Phase 5: Interrelating theme/descriptions**

Phase 5 looks at reviewing the themes and presenting them in the qualitative phase of the research (Creswell et al., 2009). To achieve the aim, a frequency analysis and subsequent discussion on the meaningful data and trends were conducted.

At this stage of the research, the researcher had a table of overall themes, subcategories and several dozen codes. The aim was now to analyse the themes and subcategories in the data captured from the interviews.

To assist with the data analysis, the Excel document created, as discussed earlier in this chapter, was used in the identification of subcategories in the data that had been described by different participants. The “% of participant responses overall data” was calculated by dividing the number of mentions per subcategory from the column titled “N of participants who mentioned it” by the total responses overall. The data analysis process was then assisted by conditional formatting, where any value exceeding 25% of the data in a theme and any value equal to or exceeding 1.39% of the total data gathered was highlighted in green. These two specific data values were chosen by the researcher as they represented a subcategory being mentioned at least three times in the theme overall, and it was believed would assist in answering the research questions. The results of the process are indicated in table 7.3.

**Table 7.3**

*Theme Creation and Frequency Analysis*

Theme code and description	Subcategories description	Subcategories coding	N of participants who mentioned it	% of participant responses overall data	% in theme
S1Q011 – Organisational development approaches	1.) Multipronged approach	S1Q0111	2	0.93%	12.5%
	2.) Approach determined by goal or context	S1Q0112	3	1.39%	18.75%
	3.) Consultative approach	S1Q0113	5	2.31%	31.25%
	4.) Scientific or data-driven approach	S1Q0114	4	1.85%	25%
	5.) Centre-led approach	S1Q0115	2	0.93%	12.5%
			<b>16</b>	<b>7.41%</b>	<b>100%</b>
S1Q013 – Regular approach preference and advantages	1.) Buy-in	S1Q0131	6	2.78%	37.5%
	2.) Collaboration	S1Q0132	4	1.85%	25%
	3.) Holistic view	S1Q0133	3	1.39%	18.75%
	4.) Objective	S1Q0134	2	0.93%	12.5%
	5.) Diverse information	S1Q0145	1	0.46%	6.25%
			<b>16</b>	<b>7.41%</b>	<b>100%</b>
S1Q015 – Nonregular approach	1.) Research based	S1Q0151	1	0.46%	12.5%
	2.) Team building	S1Q0152	1	0.46%	12.5%
	3.) Prescriptive and top down	S1Q0153	5	2.31%	62.5%
	4.) Opinion-based approach	S1Q0154	1	0.46%	12.5%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
	1.) Use experience	S1Q0161	1	0.46%	6.25%

S1Q016 – Nonregular approach reasons for non-use and limitations	2.) No team in place to drive or availability of participants	S1Q0162	2	0.93%	12.5%
	3.) They fail or implementation is limited	S1Q0163	3	1.39%	18.75%
	4.) Lack of buy-in	S1Q0164	8	3.70%	50%
	5.) No pressures to use them	S1Q0165	1	0.46%	6.25%
	2.) No limitations	S1Q0172	1	0.46%	6.25%
			<b>16</b>	<b>7.41%</b>	<b>100%</b>
S1Q021 – Useful data sources and structure	1.) Research material and other sources	S1Q0211	5	2.31%	20.83%
	2.) People engagement data	S1Q0212	6	2.78%	25%
	3.) System information	S1Q0213	2	0.93%	8.33%
	4.) Hard and soft data	S1Q0214	9	4.17%	37.5%
	1.) Data analytics is a weak area	S1Q0311	1	0.46%	4.17%
	5.) Depends on context	S1Q0315	1	0.46%	4.17%
			<b>24</b>	<b>11.11%</b>	<b>100%</b>
S1Q032 – Data sources accessibility	1.) Not easily accessible	S1Q0321	4	1.85%	50%
	2.) Accessible	S1Q0322	2	0.93%	25%
	3.) Some data is accessible and other data not	S1Q0323	2	0.93%	25%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
S1Q033 – Data sources' format and characteristics	1.) Structured (reports, publications, lists, presentations)	S1Q0331	3	1.39%	18.75%
	2.) Unstructured (data dumps & social media)	S1Q0332	1	0.46%	6.25%
	3.) Both (unstructured and structured)	S1Q0333	4	1.85%	25%
	1.) Summaries in research material	S1Q0411	1	0.46%	6.25%
	2.) It can be analysed	S1Q0412	3	1.39%	18.75%
	3.) Accurate and reputable	S1Q0413	4	1.85%	25%
			<b>16</b>	<b>7.41%</b>	<b>100</b>
S1Q051 – HRIS exposure and understanding	1.) Significant exposure	S1Q0511	3	1.39%	18.75%
	2.) Some exposure	S1Q0512	3	1.39%	18.75%
	3.) Not significant exposure	S1Q0513	2	0.93%	12.50%
	1.) Basic	S1Q0611	3	1.39%	18.75%
	2.) Intermediate	S1Q0612	5	2.31%	31.25%
			<b>16</b>	<b>7.41%</b>	<b>100</b>
S1Q071 – HRIS data use	1.) Yes	S1Q0711	8	3.70%	100%
	2.) No	S1Q0712	0	0.00%	0.00%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
S1Q072 – Specific HRIS data used and reasons	1.) Demographic and employee-associated information	S1Q0721	4	1.85%	25%
	2.) Performance and talent data	S1Q0722	2	0.93%	12.5%
	3.) Payroll data	S1Q0723	1	0.46%	6.25%

	4.) Position information	S1Q0724	1	0.46%	6.25%
	1.) Provides trends, pictures and assists with statistical analysis	S1Q0731	5	2.31%	31.25%
	2.) Inform decisions	S1Q0732	3	1.39%	18.75%
			<b>16</b>	<b>7.41%</b>	<b>100%</b>
S1Q074 – HRIS data quality	1.) Not good or limited	S1Q0741	3	1.85%	50%
	2.) Good	S1Q0742	5	1.85%	50%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
S1Q075 - Ethical considerations with HRIS data	1.) Yes	S1Q0751	8	3.70%	100%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
S1Q081 – Bigger need to use HRIS data	1.) Yes	S1Q0811	8	3.70%	100%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
S1Q082 – Greatest value of HRIS data	1.) Slice and dice information	S1Q0821	1	0.46%	12.5%
	2.) Inform decision making and provide insights	S1Q0822	4	1.85%	50%
	3.) Team composition for events	S1Q0823	1	0.46%	12.5%
	4.) Career development	S1Q0824	1	0.46%	12.5%
	5.) Compliance and financial benefits	S1Q0825	1	0.46%	12.5%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
S2Q011 – View of OSFs and link with organisational success	1.) Good link and reasonably accurate	S2Q0111	14	6.48%	87.5%
	2.) Only shows HC elements	S2Q0112	1	0.46%	6.25%
	2.) Some are direct and others indirect	S2Q0122	1	0.46%	6.25%
			<b>16</b>	<b>7.41%</b>	<b>100%</b>
S2Q021 – Model modifications	1.) Trust and engagement	S2Q0211	3	1.39%	37.5%
	2.) Job content and related factors	S2Q0212	2	0.93%	25%
	3.) Defined purpose under transformational leadership	S2Q0213	1	0.46%	12.5%
	4.) Change capability	S2Q0214	1	0.46%	12.5%
	5.) None	SQ20215	1	0.46%	12.5%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
S2Q031 – OSFs and prediction using HRIS	1.) Yes	S2Q0311	5	2.31%	62.5%
	2.) Some “yes” and others “no”	S2Q0312	2	0.93%	25%
	3.) Cannot answer	S2Q0313	1	0.46%	12.5%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
S2Q041 – Additional HRIS data that can be used	1.) Short- and long-term incentives	S2Q0411	1	0.46%	12.5%
	2.) Onboarding and recruitment data	S2Q0412	1	0.46%	12.5%
	3.) Overtime and leave	S2Q0413	1	0.46%	12.5%

	4.) Learning and knowledge management	S2Q0414	2	0.93%	25%
	5.) Nothing specific or a combination of data	S2Q0415	3	1.39%	37.5%
			<b>8</b>	<b>3.70%</b>	<b>100%</b>
		<b>Total</b>	<b>216</b>	<b>100%</b>	

The data highlighted was meant only to provide information on specific data points and their prevalence in the themes and overall data. It was also used to assist with the overall qualitative data analysis, create the story from the data gathered and enhance readability. The final themes and subthemes were created by the researcher considering all the information analysed. Data that may not have been highlighted was still reviewed and used for the analysis and featured in the findings reported at the end of the chapter where it was deemed relevant by the researcher.

The notable items identified from the frequency analysis and some unique perspectives believed to achieve the aims of the qualitative section of the research were discussed in more detail in the breakdown between the qualitative questionnaire's sections 1 and 2 below. The results are provided in table 7.4.

### Section 1: Organisational development approaches and HRIS

**Table 7.4**

#### *Section 1 Qualitative Interview Themes and Subcategories*

Theme	Notable subthemes	% of responses in the data	% of the theme
Organisational development approaches	Consultative approach	2.31%	31.75%
	Scientific or data driven	1.85%	25%
Regular approach preference and advantages	Buy-in	2.78%	37.5%
	Collaboration	1.85%	25%
Nonregular approach	Prescriptive and top down	2.31%	62.5%
Nonregular approach reasons for nonuse and limitations	Lack of buy-in	3.75	50%
Useful data sources and structure	Hard and soft data	4.17%	37.5%
	People engagement data	2.78%	25%
Data sources' accessibility	Not easily accessible	1.85%	50%
Data sources' format and characteristics	Both (structured and unstructured)	1.85%	25%
	Accurate and reliable	1.85%	25%
HRIS exposure and understanding	Significant exposure	1.39%	18.75%
	Some exposure	1.39%	18.75%
	Intermediate	2.31%	31.25%

HRIS data use	Yes	3.7%	100%
Specific HRIS data used and reasons	Provides trends, pictures and assists with statistical analysis	2.31%	31.25%
	Demographic and employee-associated information	1.85%	25%
HRIS data quality	Not good or limited	1.85%	50%
	Good	1.85%	50%
Ethical considerations with HRIS data	Yes	3.7%	100%
Bigger need to user HRIS data	Yes	3.7%	100%
Greatest value of HRIS data	Inform decision making and provide insights	1.85%	50%

Table 7.4 highlights the most notable and identifiable subcategories of data for each theme, determined by the number of participants who provided it as an answer to the questions. It can be summarised as follows: Some of the participants indicated a consultative approach as their preferred approach, which involved engaging with key stakeholders in the interventions designed. Another notable approach was identified as scientific, or data driven relying on objective data to design interventions. A benefit and advantage indicated by the participants for their chosen approaches was buy-in and collaboration. For approaches not used regularly, the one most often cited was a prescriptive or top-down approach. The primary limitation of approaches not regularly used by participants was indicated as a lack of buy-in.

These notable findings are relevant to the aims of the study as they provide context as to the approaches being used by the participants in achieving their goals and provide a good foundation from which to explore their uses of data and HRIS.

For data uses and HRIS, the researcher identified the following as notable: A combination of hard and soft data, as well as people engagement-related data, was indicated by some participants. Data accessibility was indicated as being an issue. Data sources format described by participants was the use of both structured and unstructured data. The characteristics of the data that made it most useful was indicated by participants as being accurate and reliable. Intermediate was the way in which a meaningful portion of the participants described their HRIS understanding and exposure. All the participants indicated their use of HRIS data.

The primary reason advanced for the use of HRIS data was to provide trends, pictures and assist with statistical analysis. HRIS data quality was indicated as being good overall with a smaller portion responding that it was not good. All the participants indicated that there were ethical considerations to take into account in the use of HRIS data. All the participants indicated that there was a greater

need to make use of HRIS data. Half of the participants indicated that informing decision making and providing insights was the greatest value HRIS data could add.

## Section 2: Conceptual model review and improvements

Table 7.5 depicts the most notable subcategories highlighted for each theme, as identified by the researcher. The meaning of the answers provided by participants is discussed below.

**Table 7.5**

### *Section 2 Qualitative Interview Themes and Subcategories*

Theme	Notable subthemes	% of the data	% of the theme
View of OSFs and link with organisational success	Good link and reasonably accurate	6.48%	87.5%
	Only shows HC elements	0.46%	6.25%
Model modifications	Trust and engagement	1.39%	37.5%
	Job content and related factors	0.93%	25%
	Defined purpose under transformational leadership	0.46%	12.5%
	Change capability	0.46%	12.5%
OSFs and prediction using HRIS	Yes	2.31%	62.5%
	Some “yes” and others “no”	0.93%	25%
Additional HRIS data that can be used	Nothing specific or a combination of data	1.39%	37.5%
	Learning and knowledge management	0.93%	25%

Based on the questions asked regarding OSFs and the conceptual model designed, the following points were deemed meaningful by the researcher: A notable number of participants believed that there was a good link between the OSFs and organisational success. One participant, however, did have a unique view that the OSFs in the model only represented human capital-related elements. Trust and engagement were identified as OSFs that were not currently in the model and should be added.

Other notable views were job content and related factors, defined purpose under transformational leadership and an organisation’s change capability. A notable number of participants believed that the OSFs could be predicted using an HRIS. A combination of existing data or nothing specific was the answer provided the most by the participants. Learning and knowledge management was another notable response in additional data that could be used.



## Phase 6: Interpreting the meaning of themes/descriptions

In phase 6 of the qualitative data analysis process, based on the analysis completed, the process was interpreted (Creswell, 2009; 2014; Tashakkori & Teddlie, 2010). To this end, the following notable trends and findings emerged: Involving people in the process is key and buy-in appears to be a crucial element of successful interventions. Directive approaches do not work because of the lack of buy-in from key stakeholders. Multiple sources of information with many formats are used when designing interventions. Participants appear to have been exposed to and understand HRISs up to an intermediate level and HRIS data appears to be used. The data was highlighted as being good quality, although accessibility was indicated as a challenge in some instances.

### 7.5 Reporting the findings

The findings of the qualitative phase of the research are presented according to overall themes and subcategories developed during the analysis. As indicated in table 7.6, there were many themes and subthemes. The primary reason for this was the nature of the questions asked and the participants' responses. Each theme focused on something specific and of specific interest to the overall research, and it is surmised that the detail and value this added to the overall analysis would have been lost if they had been condensed into fewer themes. Comments made by the participants have also been added in support of the themes created.

**Table 7.6**

#### *Themes and Subcategories Identified*

<b>Theme description</b>	<b>Subtheme description</b>
1.) Organisational development approaches	1.1) Multipronged approach
	1.2) Approach determined by goal or context
	1.3) Consultative approach
	1.4) Scientific or data-driven approach
	1.5) Centre-led approach
2.) Regular approach preference and advantages	2.1) Buy-in
	2.2) Collaboration
	2.3) Holistic view
	2.4) Objective
	2.5) Diverse information
3.) Nonregular approach	3.1) Research based
	3.2) Team building

	3.3) Prescriptive and top down
	3.4) Opinion-based approach
4.) Nonregular approach reasons for non-use and limitations	4.1) User experience
	4.2) No team in place to drive or availability of participants
	4.3) They fail or implementation is limited
	4.4) Lack of buy-in
	4.5) No pressures to use them
	4.6) No limitations
5.) Useful data sources and structure	5.1) Research material and other sources
	5.2) People engagement data
	5.3) System information
	5.4) Hard and soft data
	5.6) Data analytics is a weak area
	5.7) Depends on context
6.) Data sources' accessibility	6.1) Not easily accessible
	6.2) Accessible
	6.3) Some data is accessible and other not
7.) Data sources' format and characteristics	7.1) Structured (reports, publications, lists, presentations)
	7.2) Unstructured (data dumps & social media)
	7.3) Both
	7.4) Summaries in research material
	7.5) It can be analysed
	7.6) Accurate and reputable
8.) HRIS exposure and understanding	8.1) Significant exposure
	8.2) Some exposure
	8.3) Not significant exposure
	8.4) Basic
	8.5) Intermediate
9.) HRIS data use	9.1) Yes
10.) Specific HRIS data used and reasons	10.1) Demographic and employee-associated information
	10.2) Performance and talent data
	10.3) Payroll data
	10.4) Position information
	10.5) Provides trends, pictures and assists with statistical analysis
	10.6) Inform decisions

11.) HRIS data quality	11.1) Not good or limited
	11.2) Good
12.) Ethical consideration with HRIS data	12.1) Yes
13.) Bigger need to use HRIS data	13.1) Yes
14.) Greatest value of HRIS data	14.1) Slice and dice information
	14.2) Inform decision making and provide insights
	14.3) Team composition for events
	14.4) Career development
	14.5) Compliance and financial benefits
15.) View of OSFs and link with organisational success	15.1) Good link and reasonably accurate
	15.2) Only shows HC elements
	15.3) Some are direct and others indirect
16.) Model modifications	16.1) Trust and engagement
	16.2) Job content and related factors
	16.3) Defined purpose under transformational leadership
	16.4) Change capability
	16.5) None
17.) OSFs and prediction using HRIS	17.1) Yes
	17.2) Some “yes” and others “no”
	17.3) Cannot answer
18.) Additional HRIS data that can be used	18.1) Short- and long-term incentives
	18.2) Onboarding and recruitment data
	18.3) Overtime and leave
	18.4) Learning and knowledge management
	18.5) Nothing specific or a combination

Owing to the number of themes and subthemes, the approach adopted in reporting on the findings was to focus only on those that were identified as being notable from the qualitative data analysis by the researcher and that contributed to answering the overall research questions and aims.

### 7.5.1 Theme 1: Organisational development approaches

At the start of the qualitative interview, all the participants were asked to provide feedback on the organisational development approaches they used to assist either individuals, teams or organisations. The result was a mixture of responses, and the approaches that emerged as the subthemes that are discussed below were consultative and scientific or data driven.

#### *7.5.1.1 Subtheme 1.3: Consultative approach*

For several of the participants, the approach they indicated as the one they used in engaging with customers was consultation. This approach was characterised by understanding the need and then working with the customer to meet this need.

#### *7.5.1.2 Subtheme 1.4: Scientific or data driven*

Another notable approach from the analysis was a scientific or data-driven approach, which has a significant reliance on the use of data to address the need or resolve the issue. The data would be gathered before any decisions were made on how best to proceed.

### 7.5.2 Theme 2: Regular approach preference and advantages

This theme involved delving deeper into understanding why the participants chose specific approaches, and the advantages of the approaches from their perspective. Two notable subthemes emerged from an analysis of the data, namely buy-in and collaboration.

#### *7.5.2.1 Subtheme 2.1: Buy-in*

Buy-in emerged from the data analysis as a notable subtheme and was identified in the analysis from the participants as a critical component for success. It was cited as a significant reason in utilising the approaches the participants indicated. Giving people a say, obtaining their input and being able to course correct quickly were some of the answers provided.

### *7.5.2.2 Subtheme 2.2: Collaboration*

In the overall theme, collaboration was the other important subtheme identified, which was deemed to have a relationship with the subtheme of buy-in. The core of this subtheme related to the advantage of having more than one perspective, obtaining diverse feedback and affording people an opportunity to be listened to.

### *7.5.3 Theme 3: Nonregular approach*

This theme sought to understand the approaches not used regularly by participants, based on their experience and perspectives. In the analysis, one subtheme identified among several participants is discussed in greater detail below.

#### *7.5.3.1 Subtheme 3.3: Prescriptive or top down*

A prescriptive or top-down approach in which clients and stakeholders were told what to do, was identified as being the approach used least regularly. In this approach, an answer or solution was already created and then customers were instructed what to do instead of having the opportunity to provide input and assist with the solution design.

### *7.5.4 Theme 4: Nonregular approach reasons for non-use and limitations*

For approaches that were identified as not being used regularly, the participants were requested to provide the primary reasons for and limitations of these approaches. According to the researcher, the result was related to the advantages and reasons provided for use as proposed in theme 2. The main subtheme that emerged from the analysis was a lack of buy-in, which is discussed below in more detail.

#### *7.5.4.1 Subtheme 4.4: Lack of buy-in*

In contrast to the buy-in indicated in theme 2, a lack of buy-in was indicated and identified as a notable reason for not using specific approaches. Using an approach that did not promote buy-in,

one participant indicated that it was disrespectful to the customers and did not allow them to be heard in the process.

#### 7.5.5 Theme 5: Useful data sources and structure

As the focus for the qualitative interviews narrowed using the funnel approach described earlier in this chapter, questions were posed that related to the data sources most used by the participants and the structure in which they found this information. Two subthemes of those identified in the data analysis are discussed below, namely people engagement data and a combination of hard and soft data.

##### *7.5.5.1 Subtheme 5.2: People engagement data*

The researcher deemed the first subtheme in this theme, namely people engagement data, to be significant. The subtheme was used to house responses provided by participants about data gathered mainly from engaging with the subjects directly in the form of interviews, focus groups and workshops included in the approaches followed and solutions designed. Participant B commented that they used data gathered from interviews, focus groups, training, workshops, survey feedback, consultation and brainstorming.

##### *7.5.5.2 Subtheme 5.4: Hard and soft data*

The second subtheme identified worthy of discussion in the analysis for the theme relating mainly to the structure of the data, was that of participants' use of a combination of hard and soft data or unobtrusive and obtrusive data. This included making use of data from engaging with people directly, as well as data from sources such as policies, documents, archives and databases. Several participants indicated a preference for using combinations of data when designing interventions and solutions. Participant F commented that they used literature available, varsity textbooks, internet, policies, guides (code of conduct), focus groups, survey results, exit interview data, stay interviews, feedback from training, forms and orally, notes from sessions from questions asked. HR system data, terminations, employee lists, scorecards.

### 7.5.6 Theme 6: Data sources' accessibility

Based on the feedback provided by the participants on the types and structures of data they used, the next major theme created was that of data accessibility. One notable sub-theme was identified in the analysis where data was indicated as not being easily accessible. This subtheme is discussed in more detail below.

#### *7.5.6.1 Subtheme 6.1: Not easily accessible*

Under the subtheme of not easily accessible, the participants advanced numerous reasons as to why they were not able to obtain certain data they needed. Reasons for lack of data availability were lack of system integration and of direct access to sources and systems. Participant A commented that data was not easily accessible in the organisation and that data in an HRIS is key.

### 7.5.7 Theme 7: Data sources' format and characteristics

Once the availability of data had been addressed, the next theme created related to the format of the data and the characteristics that made it most useful to the participants. Two subthemes were identified in the data analysis. The first was the use of a combination of both structured and unstructured data, while the second related specifically to the characteristics of the data that made it useful, namely that it was accurate and reliable.

#### *7.5.7.1 Subtheme 7.3: Both (structured and unstructured)*

Regarding the data format used by participants, a combination of both structured and unstructured data emerged as a notable subtheme. This subtheme included information that was contained in varying formats, such as presentations, Excel, MsWord, publications, magazines, research material, financial reports, transactional data and data dumps. Participant C comment that they used both were used, such as data dumps and reports, such as financial reports and transactional data for trend analysis.

#### *7.5.7.2 Subtheme 7.6: Accurate and reliable*

For several participants, the accuracy and reliability of the data in the formats they utilised made it the most useful in the approaches they followed and the ultimate solutions they designed. According to the participants, the data gathered was accurate and reliable when it had been reviewed by others and came from reputable sources with independent verification and facts.

#### *7.5.8 Theme 8: HRIS exposure and understanding*

The next phase of the qualitative research again became more focused on a topic that related directly to the overall topic of the research. The theme created in this phase dealt specifically with the participants' exposure to and understanding of HRISs. Three subthemes were identified in the analysis, which were deemed to relate to the overall aims of the research. These included significant exposure, some exposure and intermediate level of understanding of HRISs.

##### *7.5.8.1 Subtheme 8.1: Significant exposure*

The subtheme of significant exposure was used to characterise answers by participants that indicated that they had been exposed to HRISs significantly in their careers. The participants' classification of exposure as significant varied from being a user of the HRIS to having implemented it in previous organisations in which they had worked. Participant G responded to the question when asked by saying that HRIS was a business enabler and assists the org make decisions and that they had a good understanding of these systems.

##### *7.5.8.2 Subtheme 8.2: Some exposure*

The next subtheme relating to exposure was some exposure where the participants' answers indicating a degree of exposure were collated. The primary reason provided for some exposure related to use of systems in current or previous organisations predominantly as a user of the systems.



### *7.5.8.3 Subtheme 8.5: Intermediate*

The next subtheme created was that of intermediate, which was used to describe the level of understanding of HRISs that participants attributed to themselves. The participants' answers that were used to create the subtheme related to comprehension of an HRIS's functionality, understanding it as a business enabler and being generally well founded. Participant F commented that their understanding of HRIS on a rating scale of 1 to 5 was low.

### *7.5.9 Theme 9: HRIS data use*

Once the level of exposure and understanding of an HRIS for participants had been determined, the next step in the qualitative research phase was to identify the use of HRIS data in the design of interventions and solutions. Only one subtheme was identified in the theme, that is, all participants indicated that they used HRIS data.

#### *7.5.9.1 Subtheme 9.1: Yes*

The data analysis revealed that all the participants indicated use of HRIS data in the design of interventions and solutions. This was a particularly indicative subtheme that contributed towards the overall aim of the research as it established that participants did in fact utilise information from an HRIS.

### *7.5.10 Theme 10: Specific HRIS data used, and reasons*

Once the use of HRIS data had been established among the participants, the next level of analysis focused on why the data was used and the primary reasons for use. The overall theme developed encapsulated both elements and resulted in several subthemes. The researcher identified two as being particularly notable for demographic and employee-associated information and providing trends and pictures, and assisting with statistical analysis.

#### *7.5.10.1 Subtheme 10.1: Demographic and employee-associated information*

The first subtheme created from the analysis was the type of information used by participants that covered employee information such as age, period employed by the organisation, headcount and other biographical information. Participant D commented that they used employee lists, like age, duration with the organisation etc. Exit interviews from workflow system.

#### *7.5.10.2 Subtheme 10.5: Provides trends and pictures and assists with statistical analysis*

The second subtheme of importance focused specifically on the reasons why information was used. This subtheme covered reasons for the use of information, such as providing a greater overall understanding, assisting with the statistical analysis, the ability to identify trends and patterns, providing a snapshot and tracking transformations through initiatives over time.

### 7.5.11 Theme 11: HRIS data quality

At this juncture, a better understanding had been gained of HRIS data and if it was used, the actual data used and the reasons for this. The next theme that was created focused on the quality of the information that participants had access to. In this theme, two subthemes emerged, namely not good or limited and good. These are discussed in more detail below.

#### *7.5.11.1 Subtheme 11.1: Not good or limited*

The first subtheme related to data that was indicated as not good or limited by the participants and was the collation of responses such as data not being integrated or not being extensive enough, and that a lack of discipline on the part of the people involved in the process led to poor data quality. Participant A commented that the information was not integrated, not extensive or far reaching enough.

#### *7.5.11.2 Subtheme 11.2: Good*

The second subtheme focused on data that was indicated as being good overall by the participants and was created from the answers provided, such as that fact that it was used to make business decisions, it was an integral part of the work of the company for planning and it informed the

reasons behind actions such as employee exits. Participant H commented that data quality was good, but it was not easily available.

#### 7.5.12 Theme 12: Ethical considerations with HRIS data

The researcher regarded ethics and ethical considerations for the use of data to be an area requiring focus in order to gain a better understanding of how participants perceived the matter. Only one subtheme emerged in the analysis for the overall theme that indicated the participants believed that there were ethical considerations in the use of HRIS data.

##### *7.5.12.1 Subtheme 12.1: Yes*

Overall, all the participants agreed that there were ethical considerations in the use of HRIS data owing specifically to legislative requirements such as POPI. Other responses indicated that the use of private and personal information was important and therefore needed to be treated confidentially. Participant B commented that HRIS data was highly confidential and cannot be shared.

#### 7.5.13 Theme 13: Bigger need to use HRIS data

As the focus on HRIS was narrowed during the qualitative data-gathering process, another theme emerged in the analysis of the data regarding whether there was a bigger need to use HRIS data in designing interventions and solutions. All the participants answered in the affirmative, indicating that they believed there was a bigger need to use HRIS data.

##### *7.5.13.1 Subtheme 13.1: Yes*

All the participants answered affirmatively on whether there was a bigger need to utilise HRIS data. Participant D answered that there was a bigger need to make use of HRIS data as it makes peoples' lives easier and allows for the data to be manipulated. Participant D answered that there was a bigger need to make use of HRIS data as it makes peoples' lives easier and allows for the data to be manipulated.

#### 7.5.14 Theme 14: Greatest value of HRIS data

Because the need for utilising HRIS data was identified, the next notable theme created was the greatest value that HRIS data could add. In the data analysis only one subtheme proved significant, namely informing decision making and providing insights.

##### *7.5.14.1 Subtheme 14.2: Inform decision making and provide insights*

The subtheme emanating from the data analysis collated the responses from several participants who indicated HRIS data could add the greatest value by providing data for decision making, with talent decisions and insights being emphasised. One participant indicated that the value of HRIS data was to provide insights into the relationship between the employer and employees. Participant D commented that HC is a support function and that HRIS information adds value by informing decision making, specifically around talent.

#### 7.5.15 Theme 15: View of OSFs and relationship with organisational success

The second phase of the qualitative data analysis focused on the conceptual model that had been developed on the basis of the literature review. The aim was to solicit the views of the participants on the model and its link with organisational success.

##### *7.5.15.1 Subtheme 15.1: Good link and reasonably accurate*

Several participants stated that the model had good or reasonable links between the OSFs and organisational success. This ranged from indications of good to very strong links. The participants also mentioned that some of the OSFs had direct or short-term links with organisational success, with others having a longer-term focus. An example was a direct relationship between process and systems and organisational success, while knowledge management and leadership were deemed to have longer-term impacts. Participant A commented that the OSFs and the links with organisational success indicated interconnected thinking, as well as the positive and negative impacts if the OSFs were present or not.

#### *7.5.15.2 Subtheme 15.2: Only shows HC elements*

One unique view expressed by a participant indicated that the model appeared to focus only on HC elements and did not incorporate other elements.

#### *7.5.16 Theme 16: Model modifications*

A key objective of the qualitative phase of the research was to refine the conceptual model designed on the basis of the literature review. To this end, a theme was created encapsulating the feedback provided on the various enhancements and changes that could be made to the model from the participants' perspective. Overall, several subthemes emerged that encapsulated the different additions or enhancements. These were trust and engagement, job content and related factors, defined purpose under transformational leadership and change capability.

##### *7.5.16.1 Subtheme 16.1: Trust and engagement*

A particularly notable addition that was observed was that of trust and engagement, which several participants mentioned as needing to be added as an OSF. Engagement was an important enhancement to the model with one participant highlighting the fact that job satisfaction was too narrowly focused. The feeling was that the addition of engagement as an OSF to the model would enhance its overall relationship with organisational success. Participant D recommended that a talent OSF should be added to the model with onboarding and recruitment as measures. This was a significant perspective that had not been expressed by other participants. The researcher ultimately decided that the theme of engagement and trust would be best to cover this perspective.

##### *7.5.16.2 Subtheme 16.2: Job content and related factors*

Based on the feedback provided, job satisfaction and organisational commitment were identified during the analysis as requiring some enhancement. A subtheme of job content and related factors was thus created because it was deemed to enhance the existing OSF. The two areas encapsulated in the subtheme were job content and the feedback on pay and benefits. Participant B commented that job content should be included in the JS and OC factor.

#### *7.5.16.3 Subtheme 16.3: Defined purpose under transformational leadership*

One of the participants suggested that defined purpose was an additional measure required under the OSF transformational leadership. This was deemed an enhancement relating to the direction that leadership should provide to their teams. Participant C commented that a clearly defined purpose and intent should be added under transformational leadership.

#### *7.5.16.4 Subtheme 16.4: Change capability*

Another OSF cited by participants and a subtheme created was change capability. This subtheme related specifically to an organisation's ability to manage and deal with change, and the researcher considered this to be a suitable addition to the model in today's world of work. Participant F in particular recommended change capability be included.

### *7.5.17 Theme 17: OSFs and prediction using HRIS*

The ability of an HRIS to predict the OSFs was a key aim of the research and was therefore an important theme created. Two subthemes emerged in the data analysis. The first was "yes" and the second some "yes" and others "no".

#### *7.5.17.1 Subtheme 17.1: "Yes"*

When asked the question that formed the basis of the theme, several participants indicated their agreement that an HRIS could be used to predict the OSFs in the model. This was notable for the purposes of the research, and proved useful in the quantitative phase of the research. Participant G felt that the OSFs could be predicted using an HRIS and commented that you could use an HRIS to predict factors. They advised that they think that if they review data and use several data points, they could create predictive analytics.

#### *7.5.17.2 Subtheme 17.2: Some "yes" and others "no"*

This subtheme was created to contain responses that indicated a mixed view. Some participants indicated that some of the OSFs could be predicted by an HRIS, while others disagreed. Examples of OSFs that could not be measured according to participants were innovation, leadership and culture.

This view was articulated by participant C specifically who commented that some of the factors could be predicted by using data extracted from an organisations HRIS but others, like leadership, culture and innovation, could not.

This was considered significant in relation to the overall study and aligned with the researcher's view. The aim of the model was to measure certain OSFs and since they themselves were indicators of others, this would provide an indication of OSFs that could not be directly measured using an HRIS and their prevalence in an organisation.

#### 7.5.18 Theme 18: Additional HRIS data that can be used

The final theme that emerged from the data analysis focused on the feedback received from participants on any additional HRIS-related data that they felt could be used for the model. The two subthemes that emerged in this theme considered notable and worth discussing in more detail by the researcher were learning and knowledge management-related data and either a combination of data or that they had nothing specific to add. The other subthemes created are not discussed because elements thereof had already been incorporated into the model.

##### *7.5.18.1 Subtheme 18.4: Learning and knowledge management*

The first subtheme consolidated views on data relating to learning and knowledge management including a focus on training courses, qualifications that employees had and the institutions where they were obtained. The participants felt that this would be useful information for the overall model. Participant F commented that training courses to show potential individuals have and their quality could be additional data used.

##### *7.5.18.2 Subtheme 18.5: Nothing specific or a combination of data*

For the second significant subtheme, data was consolidated that dealt with either nothing that was indicated needed to be added or a combination of existing and other data. Examples of data to be reviewed included ethics line information, learning and knowledge management data, exit data and project management data. Some of these elements had already been included in the conceptual model. Participant A commented that ethics line, learning and knowledge management data, exit and project management system data would be good additional HRIS data to use.

## 7.6 Conceptual model refinement

A key aim of the qualitative phase of the research was to review the conceptual model developed on the basis of the literature review as discussed in chapter 6 and to refine and enhance it based on the feedback provided by the subject matter experts who were interviewed. Based on the analysis performed in chapter 8, experts in industrial psychology and a statistician were consulted about additions and refinements to the model, which the researcher felt would enhance the model in order to provide a potential list of OSFs and possible measures that had a relationship with organisational success.

The sources of the additions and refinements were the results of the qualitative data analysis and interrogation of the initial literature review conducted. The additions and refinements to the model are indicated in table 7.7.

**Table 7.7**

### *Refined Model*

Organisational success factors	Measures	Sources
Employee engagement	Added from qualitative phase of the research	
Change capability	Added from qualitative phase of the research	
Job satisfaction	Length of service	(Janićijević et al., 2018; Ok & Park, 2018; Riza et al., 2018)
	Low voluntary turnover	(Abelha et al., 2018; Bakotić, 2016; Koh et al., 2017; Ok & Park, 2018; Yap Peng Lok et al., 2019)
	Age	(Janićijević et al., 2018; Riza et al., 2018; Sánchez-Sallero & Sánchez-Sallero, 2017; Tasios & Giannouli, 2017; Yap Peng Lok et al., 2019)
	Higher pay	(Janićijević et al., 2018; Končar & Marić, 2015; Mabaso & Dlamini, 2018; Riza et al., 2018; Sánchez-Sallero & Sánchez-Sallero, 2017; Schwendimann et al., 2016; Tasios & Giannouli, 2017)



	Absenteeism	(Abelha et al., 2018; Roberts & Savage, 1973; Schwendimann et al., 2016)
	Gender	(Abelha et al., 2018; Roberts & Savage, 1973; Sánchez-Sallero & Sánchez-Sallero, 2017; Yap Peng Lok et al., 2019)
	Job content	Added from qualitative phase of the research
	Organisational commitment	(Abelha et al., 2018; Koh et al., 2017)
Organisational commitment	Low voluntary turnover	(Koh et al., 2017)
	Age	(Yap Peng Lok et al., 2019)
	Absenteeism	(Schwendimann et al., 2016),
	Gender	(Yap Peng Lok et al., 2019)
	Total rewards elements	(Mabaso & Dlamini, 2018; Ndlovu et al., 2018)
	Job satisfaction	(Mabaso & Dlamini, 2018; Yap Peng Lok et al., 2019)
Knowledge management	Technology used to support knowledge management	(Cao et al., 2013; Choe, 2016; Dermol, 2013; Jaaron & Backhouse, 2017; Leufvén et al., 2015; Mac & Evangelista, 2017; Rašul et al., 2012; Tohidi et al., 2012)
	Elements for a good KM system	(Goodhue & Thompson, 1995)
Organisational learning	CPD activities	(Puteh, 2017)
	Job satisfaction	(Chiva & Algere, 2009; Tohidi et al., 2012)
Mature business process	CMM maturity levels (defined level)	(Kalinowski, 2016)
	Processes mapped	(Akpoviro et al., 2019)

	Process-oriented organisational structure and improvement focused	(Leyer et al., 2017)
Organisational culture	Job satisfaction	(El Din & El Ghetany, 2015; Malik et al., 2017; Trmal et al., 2015; Yap Peng Lok et al., 2019)
	Organisational commitment	(El Din & El Ghetany, 2015; Malik et al., 2017; Trmal et al., 2015; Yap Peng Lok et al., 2019)
	Innovation	(Belac et al., 2017; Min et al., 2016; Pucetaite et al., 2016; Szymanska, 2016)
	Technological subsystems	(Kekwaletswe & Ncube, 2018; Martins, 2014)
	Implementation of total reward elements based on preference	(Bussin et al., 2016)
	Competing values framework types	(Belac et al., 2017; Hartnell et al., 2019)
	Leadership	(Deloitte, 2018; Hartnell et al., 2016; Khan & Wan Ismail, 2017; Mash et al., 2016; Meng & Berger, 2013; Stacho et al., 2017; Törnblom, 2017).
Transformational leadership	Job satisfaction	(Malik et al., 2017; Khan & Wan Ismail, 2017; Trmal et al., 2015)
	Organisational commitment	(Malik et al., 2017)
	Organisational learning	(Khan & Wan Ismail, 2017)
	Defined purpose	Added from qualitative phase of the research
Ethical leadership	Organisational citizenship behaviour	(Mozumder, 2018)
	Corporate social responsibility	(Choi et al., 2015)

Authentic leadership	Enhanced employee performance	(Wei et al., 2018)
	Organisational commitment	(Wei et al., 2018)
	Work engagement	(Wei et al., 2018)
	Reduced staff turnover	(Wei et al., 2018)
	Increased trust	(Wei et al., 2018)
Overall leadership influence	Culture	(Hartnell et al., 2016; Khan & Wan Ismail, 2017; Meng & Berger, 2013; Stacho et al., 2017; Törnblom, 2017).
HRIS	The organisation has an HRIS	(Berger, 2014)
	Usage of the HRIS	(Berger, 2014)
	Reduction in administration levels with an HRIS	(Ankrah & Sokro, 2012; Siengthai & Udomphol, 2016).
	Storing of information on an HRIS	(Qaisar et al., 2018)
	Reporting and analysis conducted using an HRIS	(Anitha & Aruna, 2013; Du Plessis & De Wet Fourie, 2016; Jones, 2016; Qaisar et al., 2018).

### 7.6.1 Model additions and refinements

The specific additions and refinements made to the model are explained in greater detail in this section.

#### 7.6.1.1 Additions

Several additions were made to the model based on the results of the second phase of the research and input in preparation for the third phase of the research. These are as follows: Employee engagement and change capability were added as OSFs, job content and organisational commitment were added under job satisfaction as possible measures, and defined purpose was added as a possible measure under transformational leadership.

### *7.6.1.2 Refinements*

Several refinements were made to the model based on the results of the second phase of the research. Organisational commitment was added as an OSF on its own and as a measure of organisational culture. The following measures were also added to the OSF organisational commitment based on the initial literature reviewed for the conceptual model: Low voluntary turnover, age, low absenteeism, gender, total rewards elements, and job satisfaction.

Organisational learning was separated as an OSF on its own with a list of possible measures, as identified in the literature. These measures were continuous professional development activities and job satisfaction. Pay was modified to indicate higher pay as a possible measure of job satisfaction. Absenteeism under JS was refined to indicate low absenteeism, with reward preferences being refined to read as the implementation of total reward elements based on preference to provide greater clarity. Business processes were also refined to read mature business processes.

### *7.6.1.3 Model factor correlations*

Overall, it was determined on the basis of the initial design of the model, and reaffirmed during the qualitative data analysis, that certain OSFs could not be measured directly using data extracted from an HRIS, such as transformational leadership (TL) or organisational culture (OC). The aim in these instances, however, was to measure other OSFs, such as job satisfaction and organisational commitment, which it was believed could be measured directly based on data extracted from an HRIS. It would then be possible to use these to provide an indication of other OSFs where a relationship had been established in the literature or supported by the statistical analysis conducted. An example of this mapping was transformational leadership where both JS and OC were indicated as possible measures. If it could be determined through a review of data extracted from an HRIS that the proposed measures of JS and OC were positive, then this would indicate that transformational leadership was present in an organisation to a certain extent.

## *7.7 Chapter summary*

In this chapter, the interpretation and reporting of the qualitative data analysis process was explained. A description of the participants was provided. Strategies to enhance the quality of the

research were discussed. A reflective statement of the data analysis process and reporting of the findings with the overall themes created was reviewed and explained. The refinement of the model initially created on the basis of the literature review was affected and discussed. Additions, changes and enhancements were made to the model using feedback from the qualitative phase of the research, input from experts and a review of the literature initially consulted, in some instances.

Chapter 8 deals with the reporting and interpretation of the quantitative results of the quantitative phase of the research. The data collected from the survey sent out for completion and the statistical analysis conducted is also explained.

## Chapter 8: Reporting and Interpretation of the Quantitative Results

This chapter discusses the results of the third phase of the research, specifically the quantitative phase, where the conceptual model, created in phase 1 and refined on the basis of the analysis completed during phase 2 of the research, was statistically tested and evaluated.

### 8.1 Introduction

The study had several aims and was conducted in three distinct phases. The first phase was the literature review which resulted in the development of a conceptual model with a list of possible OSFs and their possible measures, the second was the qualitative phase and the third the quantitative phase. The main aim of the research was to develop and test a model that would make use of data extracted from an organisation's HRIS and provide an indication of the presence of OSFs through a list of possible measures. The aims of the quantitative research were as follows:

Research aim 1: To develop a valid and reliable questionnaire to measure the need for the use of HRIS data and organisational success factors

Research aim 2: To measure the constructs of HRIS, organisational culture, leadership, internal organisational processes and other constructs extracted from models of organisational performance and determine their key components

Research aim 3: To determine and test the empirical relationship between the construct of HRIS and measures based on organisational success factors

Research aim 4: To assess whether biographical variables play a moderating role in the use of HRISs

Research aim 5: To develop and test an empirical model for HRISs and measures by means of structural equation modelling

Research aim 6: To make recommendations for the discipline of industrial and organisational psychology and human resource management on HRISs and measures based on organisational success factors for future research

The results of the quantitative phase of the research are presented in this chapter.

## 8.2 Demographic profile of the sample

The study was conducted in a JSE-listed organisation with operations on the African, European and Asian continents spread over a large geographic area. The participants included employees from the Human Capital and Operational Excellence Departments in the organisation at all management levels. Of a population of 204 that was initially identified for the research, 152 participants accessed the survey (74.5%). Of these, 119 (58.3%) completed the first section of the survey, while 106 (52%) completed the entire survey. The sample was ultimately reduced to 118 for the first section of the survey, which focused on the model that had been designed, and a sample of 105 for the second section of the survey, which related specifically to HRISs owing to an unresponsive case that was identified and eliminated from the sample data.

### 8.2.1 Gender composition

Most participants who completed the model review section of the online survey ( $n = 118$ ) were females (66.1%) and 33.1% were males, with the remaining 0.8% identifying as another classification. Table 8.1 indicates the details of the gender composition of the participants. When comparing the gender composition of the participants to that of the total population of the Human Capital and Operational Excellence Departments, they were aligned owing to the mainly female composition of both departments in the organisation in which the research was conducted.

**Table 8.1**

*Gender Composition (n = 118)*

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Female	78	66,1	66,1	66,1
	Male	39	33,1	33,1	99,2
	Identifies as another classification	1	0,8	0,8	100,0
	Total	118	100,0	100,0	

### 8.2.2 Racial distribution

Table 8.2 depicts the racial composition of the participants, with the majority identified as African (56.8%), white (24.6%), Indian (10.2%) and coloured (8.5%). When reviewing the racial composition of the participants compared to the profile for the Human Capital and Operational Excellence Departments, there was alignment between the sample and the total population as the majority of those employed were African.

**Table 8.2**

*Racial Distribution (n = 118)*

		Frequency	Percent	Valid percent	Cumulative percent
Valid	African – A	67	56.8	56.8	56.8
	Coloured – C	10	8.5	8.5	65.3
	Indian – I	12	10.2	10.2	75.4
	White – W	29	24.6	24.6	100.0
	Total	118	100.0	100.0	

### 8.2.3 Educational level

Participants were given several choices to classify their educational level, as shown in table 8.3. Many of the participants indicated having a postgraduate qualification below master's level (34.7%) and an undergraduate qualification (34.7%). Of the participants, 12.7% indicated they had a master's degree, 11.9% a matric, 2.5% A or O levels and 0.8% a doctorate. When one compares the educational composition of the participants with that of the total population of the Human Capital and Operational Excellence Departments, there is an alignment because the majority of those employed in these departments had some form of higher education qualification with a significant portion having postgraduate qualifications. These departments were specifically chosen for their experience with and knowledge of the focus of the research, as well as the higher levels of education prevalent in both departments, with 69.4% of the participants having an undergraduate or postgraduate qualification below master's level.

**Table 8.3**

*Educational Level (n = 118)*



		Frequency	Percent	Valid percent	Cumulative percent
Valid	Below matric	3	2.5	2.5	2.5
	Matric	14	11.9	11.9	14.4
	A or O levels	3	2.5	2.5	16.9
	Undergraduate qualification	41	34.7	34.7	51.7
	Postgraduate below master's level	41	34.7	34.7	86.4
	Master's degree	15	12.7	12.7	99.2
	Doctorate	1	0.8	0.8	100.0
	Total	118	100.0	100.0	

#### 8.2.4 Age distribution

Four categories were created for age on the strength of the descriptive statistical analysis completed, based on the choices participants had made when selecting their age. This information is contained in table 8.4. Many of the participants were classified in the 35 to 44 (35.6%) and the 45 to 54 (32.2%) age categories. Of the participants, 23.7% were classified in the 25 to 24 age category, and 8.5% in the 55 to 64 category. When comparing the age composition of the participants with that of the Human Capital and Operational Excellence Departments there was an alignment. These departments comprise mainly staff in the 35 to 54 age bracket, with significant experience in and outside the organisation, which corresponds with the sample in this research.

**Table 8.4**

*Age (n = 118)*

		Frequency	Percent	Valid percent	Cumulative percent
Valid	25 to 34	28	23.7	23.7	23.7
	35 to 44	42	35.6	35.6	59.3
	45 to 54	38	32.2	32.2	91.5
	55 to 64	10	8.5	8.5	100.0
	Total	118	100.0	100.0	

### 8.2.5 Country of residence

Participants were asked to indicate their country of residence as part of the data collected for the research. Most of the participants indicated living in South Africa (94.1%), with 2.5% residing in Namibia, 1.7% in Zambia, and 0.8% each for Malawi and Angola. The results are provided in table 8.5. The composition of the country residence demographic data for the Human Capital and Operational Excellence Departments corresponded with that of the research participants as the majority of those employed in these departments were based in South Africa, with only a small concentration based in other countries supporting the operations.

**Table 8.5**

*Country of Residence (n = 118)*

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Malawi	1	0.8	0.8	0.8
	Angola	1	0.8	0.8	1.7
	Namibia	3	2.5	2.5	4.2
	South Africa	111	94.1	94.1	98.3
	Zambia	2	1.7	1.7	100.0
	Total	118	100.0	100.0	

### 8.3 Validity and reliability of the quantitative study

The validity and reliability of the research and how these were ensured are discussed in the different sections of this chapter.

#### 8.3.1 Validity and reliability

Validity in quantitative research refers to “the legitimacy of the findings (i.e., how accurately the findings represent the truth in the objective world)” (Venkatesh et al., 2013, p. 32). Measurement validity is an important type of validity to be established for a study and comprises content and construct validity (Cortina, 2020).

Content validity is “the extent to which a scale’s items, in the aggregate, constitute a representative sample of the topic’s content domain” (Okoro et al., 2019, p. 34). Construct validity is “whether a scale measured a construct or dimension that it was purported to measure” (Barry et al., 2011, p. 99). Content validity for the study was established by designing statements in the survey, which were based on the relationships identified in the literature review. Additionally, the survey was reviewed by the researcher’s supervisor and the statistician who had been asked to assist with the statistical analysis. According to Connell et al. (2018), face validity is more informal and subjective in terms of the perceived effectiveness of the instrument in relation to the items it contains. This was another form of validity evaluated using a pilot study conducted with three participants from the second phase of the research where the survey’s statements, readability and layout were refined, based on their input and feedback received.

Construct validity was established by carefully developing the questionnaire based on relevant and existing knowledge (Okoro et al., 2019; Venkatesh et al., 2003). This was supported using reliability analysis. The primary analysis conducted to evaluate the model was a review of the internal loadings of the indicators on their assigned construct, a review of the internal consistency of the model, the evaluation of the convergent validity, and lastly, an evaluation of the discriminant validity (Hair et al., 2017; Hair et al., 2019).

The results of the reliability analysis used to support the validity of the constructs are provided in table 8.6. The constructs with their indicators are shown in detail in table 8.7.

**Table 8.6**

*Reliability Analysis Cronbach Coefficient Alpha Values*

<b>Construct</b>	<b>Cronbach alpha</b>
Job satisfaction	0.59
Organisational commitment	0.65
Knowledge management	0.77
Organisational learning	0.71
Mature business processes	0.71
Organisational culture	0.81
Transformational leadership	0.86
Ethical leadership	0.71
Authentic leadership	0.82
Overall leadership influence	0.82
Employee engagement	0.86
Change capability	0.85
HRIS	0.91

**Table 8.7**

*Reliability Analysis Results with Constructs and their Indicators*

Potential constructs	Cronbach alpha	IIC	Potential measures/items that had a positive medium to strong correlation
Job satisfaction	0.59	0.25	6.2) Low absenteeism is an indicator of higher job satisfaction
			6.3) Organisational commitment is an indicator of higher job satisfaction
			6.4) The content of a job enhances employees' job satisfaction
			6.5) Higher pay is an indicator of higher job satisfaction
			<b>6.6) Job satisfaction is an indicator of organisational success</b>
Organisational commitment	0.65	0.28	7.1) Low voluntary turnover is an indicator of higher organisational commitment
			7.2) Low absenteeism is an indicator of higher organisational commitment
			7.3) Job satisfaction is an indicator of higher organisational commitment
			7.4) The implementation of total rewards elements enhances organisational commitment among employees
			<b>7.5) Organisational commitment is an indicator of organisational success</b>
Knowledge management	0.77	0.54	8.1) Technology used to support knowledge management is an indicator of effective knowledge management
			8.2) Elements of a good knowledge management system are an indicator of effective knowledge management
			<b>8.5) Knowledge management is an indicator of organisational success</b>
Organisational learning	0.71	0.46	8.3) Continuous professional development (CPD) activities in an organisation are an indicator of effective learning management
			8.4) Job satisfaction is an indicator of effective organisational learning
			<b>8.6) Organisational learning is an indicator of organisational success</b>
Mature business processes	0.71	0.37	9.1) The defined level described by the Capability Maturity Model (CMM) is an indicator of mature business processes in an organisation
			9.2) Processes that have been mapped out are an indicator of business processes being mature in an organisation
			9.3) An organisation that has structured itself to focus on process improvement is an indicator of business processes being mature in an organisation
			<b>9.4) Mature business processes are an indicator of organisational success</b>
Organisational culture	0.81	0.35	10.1) Job satisfaction is an indicator of a good organisational culture

			<p>10.2) Organisational commitment is an indicator of a good organisational culture</p> <p>10.3) Innovation is an indicator of a good organisational culture</p> <p>10.4) The effective utilisation of technological subsystems to turn inputs into outputs is an indicator of a good organisational culture</p> <p>10.5) The extent to which different elements of the total reward framework are implemented according to occupational group preferences is an indicator of a good organisational culture</p> <p>10.6) Effective leadership is an indicator of a good organisational culture</p> <p>10.7) The clan/group culture type as described by the Competing Values Framework is an indicator of a good organisational culture</p> <p><b>10.8) Organisational culture is an indicator of organisational success</b></p>
Transformational leadership	0.86	0.56	<p>11.1) Job satisfaction is an indicator of transformational leadership</p> <p>11.2) Organisational commitment is an indicator of transformational leadership</p> <p>11.3) Organisational learning is an indicator of transformational leadership</p> <p>11.4) A clearly defined purpose is an indicator of transformational leadership</p> <p><b>11.5) Transformational leadership is an indicator of organisational success</b></p>
Ethical leadership	0.71	0.45	<p>12.1) Organisational citizenship behaviour is an indicator of ethical leadership</p> <p>12.2) Corporate social responsibility is an indicator of ethical leadership</p> <p><b>12.3) Ethical leadership is an indicator of organisational success</b></p>
Authentic leadership	0.82	0.44	<p>13.1) Enhanced employee performance is an indicator of authentic leadership</p> <p>13.2) Work engagement is an indicator of authentic leadership</p> <p>13.3) Organisational commitment is an indicator of authentic leadership</p> <p>13.4) Reduced staff turnover is an indicator of authentic leadership</p> <p>13.5) Increased trust is an indicator of authentic leadership</p> <p><b>13.6) Authentic leadership is an indicator of organisational success</b></p>
Overall leadership influence	0.82	0.69	<p>14.1) A good organisational culture is an indicator of an effective overall leadership influence</p> <p><b>14.2) Overall leadership influence is an indicator of organisational success</b></p>
Employee engagement	0.86	0.38	<p>6.6) Job satisfaction is an indicator of organisational success</p>

			<p>7.5) Organisational commitment is an indicator of organisational success</p> <p>8.3) Continuous professional development (CPD) activities within an organisation are an indicator of effective learning management</p> <p>10.8) Organisational culture is an indicator of organisational success</p> <p>11.4) A clearly defined purpose is an indicator of transformational leadership</p> <p>11.5) Transformational leadership is an indicator of organisational success</p> <p>12.3) Ethical leadership is an indicator of organisational success</p> <p>13.6) Authentic leadership is an indicator of organisational success</p> <p>14.2) Overall leadership influence is an indicator of organisational success</p> <p><b>16.1) Employee engagement is an indicator of organisational success</b></p>
Change capability	0.85	0.38	<p>8.5) Knowledge management is an indicator of organisational success</p> <p>8.6) Organisational learning is an indicator of organisational success</p> <p>9.4) Mature business processes are an indicator of organisational success</p> <p>10.4) The effective utilisation of technological subsystems to turn inputs into outputs is an indicator of a good organisational culture</p> <p>10.5) The extent to which different elements of the total reward framework are implemented according to occupational group preferences is an indicator of a good organisational culture</p> <p>15.1) The presence of an HRIS is an indicator that an organisation is on the path to better management of its human resources information</p> <p>15.4) Storing of information on an HRIS promotes access to information across the organisation</p> <p>15.5) Analytics conducted using an HRIS is an indicator of the effective use of the HRIS</p> <p>15.7) The effective use of an HRIS is an indicator of organisational success</p> <p><b>16.2) Change capability is an indicator of organisational success</b></p>
HRIS	0.91	0.608	<p>15.1) The presence of an HRIS is an indicator that an organisation is on the path to better management of its human resources information</p> <p>15.2) Usage of an HRIS by its users is an indicator of the effectiveness of the HRIS</p> <p>15.3) A reduction in administration levels is an indicator of the effective use of an HRIS</p>

			15.4) Storing of information on an HRIS promotes access to information across the organisation
			15.5) Analytics conducted using an HRIS is an indicator of the effective use of the HRIS
			15.6) Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors in an organisation
			<b>15.7) The effective use of an HRIS is an indicator of organisational success</b>

Although the Cronbach alpha values for the constructs of job satisfaction and organisational commitment appear to be unacceptable at 0.59, according to Pallant (2016), obtaining a Cronbach alpha value that meets the benchmarks proposed is difficult when there are only a few items (less than 10), and the sample size is small ( $n = 118$ ). The job satisfaction and organisational commitment constructs had only five items each, based on the views of participants gathered from the survey and the correlation analysis that was used to assist with the indicators for the constructs. Hair et al. (2017) have suggested that the Cronbach alpha value is also not the best means to assess constructs when using PLS-SEM, and they therefore recommend using the composite reliability results, which are further explained in section 8.8.1.2 in chapter 8. Based on this guidance, the exploratory nature of the study and the strong theoretical foundation for the constructs and their possible indicators, the job satisfaction and organisational commitment constructs were retained for further analysis in the model that was to be developed and tested using PLS-SEM. All the other constructs had Cronbach alpha values above the 0.7 benchmark, indicated as being acceptable for the purposes of the exploratory study, and the constructs were therefore deemed to meet the requirements for retention (Pallant, 2016).

#### 8.3.1.1 Exploratory factor analysis (EFA)

As a complementary approach to the reliability analysis conducted in statistically analyse the constructs and their proposed measures, EFA with principal components analysis (PCA) was performed to determine what the results would yield and if there would be any viable alternatives to the constructs already proposed. The results are indicated in table 8.8.

**Table 8.8**

*Exploratory Factor Analysis Results*

Pattern matrix							
	Component						
	1	2	3	4	5	6	7
13.6) Authentic leadership is an indicator of organisational success	0.683						
12.3) Ethical leadership is an indicator of organisational success	0.625						
16.1) Employee engagement is an indicator of organisational success	0.562		0.366				
16.2) Change capability is an indicator of organisational success	0.471		0.315				
14.1) A good organisational culture is an indicator of an effective overall leadership influence	0.426		0.359				
13.5) Increased trust is an indicator of authentic leadership	0.386		0.342	0.307			
10.4) The effective utilisation of technological subsystems to turn inputs into outputs is an indicator of a good organisational culture	0.319	0.779					
10.3) Innovation is an indicator of a good organisational culture		0.583					
9.2) Processes that have been mapped out are an indicator of business processes being mature in an organisation		0.553					
9.1) The defined level described by the Capability Maturity Model (CMM) is an indicator of mature business processes in an organisation		0.488					
17.2) Older employees tend to be generally more satisfied with their jobs than younger employees		0.471					
7.2) Low absenteeism is an indicator of higher organisational commitment		0.461					
10.1) Job satisfaction is an indicator of a good organisational culture	-0.308	0.459					
8.1) Technology used to support knowledge management is an indicator of effective knowledge management		0.438	0.342				
12.2) Corporate social responsibility is an indicator of ethical leadership							
15.5) Analytics conducted using an HRIS is an indicator of the effective use of the HRIS			0.772				
15.1) The presence of an HRIS is an indicator that an organisation is on the path to better management of its human resources information			0.735				
15.4) Storing of information on an HRIS promotes access to information across the organisation			0.693				
15.7) The effective use of an HRIS is an indicator of organisational success	0.342		0.581				



7.1) Low voluntary turnover is an indicator of higher organisational commitment			0.403			
7.5) Organisational commitment is an indicator of organisational success				0.809		
6.6) Job satisfaction is an indicator of organisational success				0.761		
7.3) Job satisfaction is an indicator of higher organisational commitment				0.577		
6.3) Organisational commitment is an indicator of higher job satisfaction				0.503	0.355	
6.4) The content of a job enhances employees' job satisfaction				0.498		
14.2) Overall leadership influence is an indicator of organisational success	0.439		0.310	0.462		
7.4) The implementation of total rewards elements enhances organisational commitment among employees				0.411		
10.5) The extent to which different elements of the total reward framework are implemented according to occupational group preferences is an indicator of a good organisational culture		0.372	-0.333	0.373		
10.2) Organisational commitment is an indicator of a good organisational culture				0.336		
13.4) Reduced staff turnover is an indicator of ethical leadership					0.629	
13.2) Work engagement is an indicator of ethical leadership					0.587	
9.4) Mature business processes are an indicator of organisational success		0.307			-0.527	
13.3) Organisational commitment is an indicator of ethical leadership	0.345				0.491	
13.1) Enhanced employee performance is an indicator of ethical leadership					0.450	-0.397
9.3) An organisation that has structured itself to focus on process improvement is an indicator of business processes being mature in an organisation		0.325			-0.332	
11.4) A clearly defined purpose is an indicator of transformational leadership						-0.764
11.1) Job satisfaction is an indicator of transformational leadership						-0.759
11.3) Organisational learning is an indicator of transformational leadership						-0.646
11.5) Transformational leadership is an indicator of organisational success	0.555					-0.633
10.8) Organisational culture is an indicator of organisational success						-0.625
11.2) Organisational commitment is an indicator of transformational leadership						-0.598
10.7) The clan/group culture type as described by the Competing Values Framework is an indicator of a good organisational culture						-0.434

6.5) Higher pay is an indicator of higher job satisfaction						-0.378	
12.1) Organisational citizenship behaviour is an indicator of ethical leadership						-0.363	
10.6) Effective leadership is an indicator of a good organisational culture						-0.335	
8.3) Continuous professional development (CPD) activities within an organisation are an indicator of effective learning management							-0.735
8.5) Knowledge management is an indicator of organisational success							-0.599
8.4) Job satisfaction is an indicator of effective organisational learning				0.311			-0.554
8.6) Organisational learning is an indicator of organisational success				0.370			-0.472
8.2) Elements of a good knowledge management system are an indicator of effective knowledge management							-0.412
6.2) Low absenteeism is an indicator of higher job satisfaction		0.333					0.372
Extraction method: Principal components analysis							
Rotation method: Oblimin with Kaiser normalisation							
a. Rotation converged in 27 iterations.							

The results of the PCA revealed a seven-factor model with groupings of measures that aligned closely, in several instances, with the constructs and measures proposed and analysed using reliability analysis. When comparing the two sets of results, it was decided to utilise the reliability analysis tested constructs and measures because these were based on a strong theoretical foundation that had been further refined using the correlation analysis conducted, as discussed in section 8.7.

### 8.3.2 Composite reliability

Overall reliability relates to the quality of the measurement and focuses on whether it yields the same results when repeated (Straub et al., 2004). A scale would be considered reliable if the results were the same consistently. Internal consistency reliability for the study was established for the constructs used in the model created using the composite reliability value. The results are indicated in table 8.9.

**Table 8.9**

*Composite Reliability Results*

<b>Construct</b>	<b>Composite reliability</b>
<b>Auth leadership</b>	0.870
<b>Change Cpb</b>	1.000
<b>Emp Eng</b>	1.000
<b>Eth Leadership</b>	0.837
<b>HRIS</b>	0.932
<b>MBP</b>	0.817
<b>Org Comm &amp; JS</b>	0.844
<b>Org Culture</b>	0.858
<b>Org Lrn &amp; KM</b>	0.874
<b>Ovrl Leadership</b>	0.917
<b>Trans Leadership</b>	0.902

Based on the results, all the constructs had values above the threshold of 0.7, as proposed by Hair et al. (2017). The constructs of employee engagement and change capability had values of 1.0 owing to the fact that they were single item constructs and were evaluated in section 8.8.1 using other means.

Based on the validity, reliability analysis and composite reliability results, hypothesis H01 “A statistically significant questionnaire to measure the need for the use of HRIS data and measure the measures of organisational success factors and the factors themselves can be developed” was therefore supported. This was because the results supported the validity and reliability of the instrument designed, which had an item that specifically measured the need for the use of HRIS data, as well as items of proposed indicators of the constructs for organisational success and items for the constructs themselves and their correlation with organisational success.

## 8.4 Constructs

In terms of the literature review completed in phase 1 of the research, 13 constructs were identified with several possible measures of each. The conceptual model designed on the basis of the literature review, using these 13 constructs and their measures, was discussed in chapter 5, and then refined with input from phase 2 of the research in chapter 7. The constructs are defined below.

#### 8.4.1 Employee engagement

Employee engagement refers to the level to which employees are committed to the organisation, feel a sense of passion about their jobs, feel connected to the organisation in some way and would put in discretionary effort if required (Deery, 2005).

#### 8.4.2 Change capability

This specific construct refers to the organisation's capability to adapt to change (Anderson & Anderson, 2001).

#### 8.4.3 Job satisfaction

Locke (1976) defined job satisfaction as a pleasurable or positive emotional state resulting from the appraisal of one's job and job experiences and as a function of the perceived relationship between what one wants from one's job and what one perceives it is offering.

#### 8.4.4 Organisational commitment

Ndlovu et al. (2018, p. 2) defined organisational commitment as the relationship that exists between an individual and an organisation, attachment, identification with the organisation, the need to remain and the will to work hard to meet the organisation's goals.

#### 8.4.5 Knowledge management

Knowledge management has been defined as the "generation, representation, storage, transfer, transformation application, embedding, and protecting of organisational knowledge" (Schultze & Leidner, 2002, p. 218).

#### 8.4.6 Organisational learning

In this study, organisational learning was defined as “organisations where people continually expand their capacity to create the results, they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together” (Jaaron & Backhouse, 2017, p. 3).

#### 8.4.7 Mature business processes

For the purposes of this study, the construct of mature business processes was defined as a set of activities that transforms a set of inputs into a set of outputs for another person using people and equipment (Oladimeji et al., 2017).

#### 8.4.8 Organisational culture

In this study, organisational culture was defined as a shared set of norms, understandings, values and behaviours that direct and guide employees on what is acceptable behaviour, and ways of thinking and communicating within the organisation (Ostroff et al., 2013; Schein, 2010)

#### 8.4.9 Transformational leadership

For the purposes of this study, transformational leadership was defined as leaders with an appealing vision for their team who intellectually stimulate others in a way that is demanding and appreciative of the individual needs of the team members (Yukl, 2013).

#### 8.4.10 Ethical leadership

In this study, ethical leadership was defined “[t]he demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct to followers through two-way communication, reinforcement, and decision making” (Brown et al., 2005, p. 120).

#### 8.4.11 Authentic Leadership

For the purposes of this study, authentic leadership was defined as the foci on leaders being guided by sound moral convictions and acting in accordance with deeply held values (Avolio et al., 2009; Gardner et al. 2011).

#### 8.4.12 Overall leadership Influence

In this study, overall Leadership was defined as the specific influence that leadership itself has on an organisation.

#### 8.4.13 Effective use of an HRIS

Effective use of an HRIS deals specifically with the way in which an organisation uses HR-related systems to maximum effect.

The definition of HRIS used in this study was the system used to acquire, store, manipulate, analyse, retrieve and distribute pertinent information on an organisation's human resources (Qaisar et al., 2018).

### 8.5 Univariate analysis

Univariate statistical analysis was conducted on the 118 valid responses for the section of the survey relating to the model created, and 105 valid responses for the second section of the survey.

#### 8.5.1 Item frequencies

##### *8.5.1.1 HRIS conceptual model frequency analysis*

The frequency analysis conducted provided the results of the answers given by each respondent, indicating the number and percentage for each of the ratings on each item. Owing to the nature of

the study and the aim of determining the respondents' perception of the model developed, it was decided to use an agreement level of 50% as the cut-off in order to proceed with further statistical analysis, as discussed in section 6.7.8.1 h) in chapter 6. Agreement was determined for the purpose of the study by combining the percentage of respondents who rated an item as either "2 – agree" or "1 – strongly agree", with the result that 54 of the 59 items in the model achieved an agreement level of 50% or greater. These results are provided in the first table in Annexure A. These results came as no surprise to the researcher owing to the extensive literature review that was conducted during phase 1 of the research which informed the development of the model.

The rationale for the decision was that any agreement level of 50% and above indicated that the respondents had selected a rating higher than that of 3 – "neither agree nor disagree" for an item, which therefore indicated some level of agreement with the item in the survey. Since the survey had been designed to solicit the input of participants regarding the items and was exploratory in nature, 50% agreement was deemed sufficient to proceed with further statistical analysis.

Of the 59 items in the model, 38 achieved an agreement level of 80% and above, with 11 items achieving an agreement level of 90% and above. Of particular significance were items such as the following: 10.6) "Effective leadership is an indicator of a good organisational culture" at 95.76%; 16.1) "Employee engagement is an indicator of organisational success" at 94.07%; 14.1) "A good organisational culture is an indicator of an effective overall leadership influence" at 93.22%; and 7.5) "Organisational commitment is an indicator of organisational success" at 91.53%. These results were again not surprising because of the extensive literature review conducted.

Of the 59 items in the model, five failed to meet the agreement level of 50%, as indicated in table 8.10.

**Table 8.10**

*Items below the Agreement Level Cut-off*

Items	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Level of Agreement
6.5) Higher pay is an indicator of higher job satisfaction	0.0%	28.0%	23.7%	32.2%	16.1%	48.3%
17.1) Employees who have been with the organisation for a shorter period tend to show higher levels of job satisfaction than employees who have been with the organisation for a longer period	5.1%	28.8%	23.7%	28.0%	14.4%	42.4%

17.2) Older employees tend to be generally more satisfied with their jobs than younger employees	1.7%	22.0%	32.2%	28.8%	15.3%	44.1%
17.3) Females generally have higher levels of job satisfaction than males	10.2%	25.4%	44.9%	11.0%	8.5%	19.5%
17.5) Females generally have higher levels of organisational commitment than males	5.1%	19.5%	40.7%	22.9%	11.9%	34.7%

Of the five items identified as being below the agreement cut-off, three were removed from further statistical analysis, specifically items 17.1, 17.3 and 17.5. Items 6.5 and 17.2, however, were retained owing to the support in the literature, its proximity to the 50% agreement cut-off, as well as additional statistical support for the items discussed in section 8.8.1.

#### 8.5.1.2 HRIS usage-focused section

Section 2 of the survey included items 18 to 24 specifically for the purposes of gathering data on HRIS usage, exposure and understanding, as well as the ranking of the constructs by the participants. This data was meant to address the research aim of determining the usage of an HRIS. One item was used to achieve the research aim, namely item 19 “To what extent do you think there is a need to make use of HRIS data?” This item achieved an agreement level of 84%, indicating a strong level of agreement for the need to make use of HRIS data, as depicted in table 8.11.

**Table 8.11**

#### *HRIS Item Agreement Score*

Item	Level of agreement
19.) To what extent do you think there is a need to make use of HRIS data?	84%

#### 8.5.2 Item descriptives

In this section, the item descriptive-related statistics results are discussed with specific items having been removed from further statistical analysis.



### 8.5.2.1 One-sample statistics

#### a) HRIS conceptual model analysis

From the one-sample statistics results of the remaining 55 items in the model, all had mean scores above the test value of 3. These are indicated in table 8.12. Of the items, 38 had a mean above 4. The item with the highest rating was 10.6) “Effective leadership is an indicator of a good organisational culture” (M = 4.52, SD = 0.581), while the item with the lowest rating was item 6.5) “Higher pay is an indicator of higher job satisfaction” (M = 3.36, SD = 1.059).

**Table 8.12**

*Mean Scores for the Remaining Items*

	Sample size	Mean	Std. deviation	Std. error mean
6.1) Low voluntary turnover is an indicator of higher job satisfaction	118	3.58	1.065	0.098
6.2) Low absenteeism is an indicator of higher job satisfaction	118	3.69	1.084	0.100
6.3) Organisational commitment is an indicator of higher job satisfaction	118	4.05	0.783	0.072
6.4) The content of a job enhances employees' job satisfaction	118	4.26	0.659	0.061
6.5) Higher pay is an indicator of higher job satisfaction	118	3.36	1.059	0.098
6.6) Job satisfaction is an indicator of organisational success	118	4.19	0.886	0.082
7.1) Low voluntary turnover is an indicator of higher organisational commitment	118	3.59	1.023	0.094
7.2) Low absenteeism is an indicator higher of organisational commitment	118	3.71	0.925	0.085
7.3) Job satisfaction is an indicator of higher organisational commitment	118	4.05	0.677	0.062
7.4) The implementation of total rewards elements enhances organisational commitment amongst employees	118	4.17	0.820	0.075
7.5) Organisational commitment is an indicator of organisational success	118	4.25	0.706	0.065
8.1) Technology used to support knowledge management is an indicator of effective knowledge management	118	4.05	0.690	0.064
8.2) Elements of a good knowledge management system are an indicator of effective knowledge management	118	4.07	0.623	0.057
8.3) Continuous professional development (CPD) activities within an organisation are an indicator of effective learning management	118	4.24	0.649	0.060
8.4) Job satisfaction is an indicator of effective organisational learning	118	3.97	0.805	0.074
8.5) Knowledge management is an indicator of organisational success	118	3.97	0.842	0.078
8.6) Organisational learning is an indicator of organisational success	118	4.22	0.642	0.059
9.1) The defined level described by the Capability Maturity Model (CMM) is an indicator of mature business processes within an organisation	118	3.85	0.724	0.067
9.2) Processes that have been mapped out are an indicator of business processes being mature within an organisation	118	3.76	0.844	0.078
9.3) An organisation that has structured itself to focus on process improvement is an indicator of business processes being mature within an organisation	118	4.12	0.797	0.073
9.4) Mature business processes are an indicator of organisational success	118	4.13	0.863	0.079
10.1) Job satisfaction is an indicator of a good organisational culture	118	4.03	0.762	0.070

10.2) Organisational commitment is an indicator of a good organisational culture	118	4.14	0.707	0.065
10.3) Innovation is an indicator of a good organisational culture	118	4.22	0.775	0.071
10.4) The effective utilisation of technological sub-systems to turn inputs into outputs is an indicator of a good organisational culture	118	3.97	0.826	0.076
10.5) The extent to which different elements of the total reward framework are implemented according to occupational group preferences is an indicator of a good organisational culture	118	3.82	0.844	0.078
10.6) Effective leadership is an indicator of a good organisational culture	118	4.52	0.581	0.053
10.7) The clan/group culture type as described by the competing values framework is an indicator of a good organisational culture	118	3.88	0.818	0.075
10.8) Organisational culture is an indicator of organisational success	118	4.16	0.827	0.076
11.1) Job satisfaction is an indicator of transformational leadership	118	3.92	0.873	0.080
11.2) Organisational commitment is an indicator of transformational leadership	118	4.07	0.770	0.071
11.3) Organisational learning is an indicator of transformational leadership	118	4.14	0.670	0.062
11.4) A clearly defined purpose is an indicator of transformational leadership	118	4.28	0.678	0.062
11.5) Transformational leadership is an indicator of organisational success	118	4.29	0.752	0.069
12.1) Organisational citizenship behaviour is an indicator of ethical leadership	118	3.97	0.698	0.064
12.2) Corporate social responsibility is as an indicator of ethical leadership	118	4.05	0.804	0.074
12.3) Ethical leadership is an indicator of organisational success	118	4.36	0.710	0.065
13.1) Enhanced employee performance is an indicator of ethical leadership	118	4.08	0.730	0.067
13.2) Work engagement is an indicator of ethical leadership	118	4.04	0.697	0.064
13.3) Organisational commitment is an indicator of ethical leadership	118	3.99	0.710	0.065
13.4) Reduced staff turnover is an indicator of ethical leadership	118	3.58	0.973	0.090
13.5) Increased trust is an indicator of authentic leadership	118	4.32	0.652	0.060
13.6) Authentic leadership is an indicator of organisational success	118	4.25	0.703	0.065
14.1) A good organisational culture is an indicator of an effective overall leadership influence	118	4.42	0.618	0.057
14.2) Overall leadership influence is an indicator of organisational success	118	4.36	0.662	0.061
15.1) The presence of an HRIS is an indicator that an organisation is on the path to better management of its human resources information	118	4.22	0.730	0.067
15.2) Usage of an HRIS by its users is an indicator of the effectiveness of the HRIS	118	4.08	0.849	0.078

15.3) Reduction in administration levels is an indicator of the effective use of an HRIS	118	4.15	0.735	0.068
15.4) Storing of information on an HRIS promotes access to information across the organisation	118	4.30	0.658	0.061
15.5) Analytics conducted using an HRIS is an indicator of the effective use of the HRIS	118	4.25	0.739	0.068
15.6) Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation	118	4.08	0.758	0.070
15.7) The effective use of an HRIS is an indicator of organisational success	118	4.14	0.777	0.071
16.1) Employee engagement is an indicator of organisational success	118	4.36	0.675	0.062
16.2) Change capability is an indicator of organisational success	118	4.31	0.673	0.062
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	118	3.69	1.043	0.096

Of the remaining 55 items in the model, five had standard deviations above 1. These are indicated in table 8.13.

**Table 8.13**

*Items with a Standard Deviation Greater than 1*

	<b>N</b>	<b>Mean</b>	<b>Std. deviation</b>	<b>Std. error mean</b>
6.1) Low voluntary turnover is an indicator of higher job satisfaction	118	3.58	1.065	0.098
6.2) Low absenteeism is an indicator of higher job satisfaction	118	3.69	1.084	0.100
6.5) Higher pay is an indicator of higher job satisfaction	118	3.36	1.059	0.098
7.1) Low voluntary turnover is an indicator of higher organisational commitment	118	3.59	1.023	0.094
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	118	3.69	1.043	0.096

The results in table 8.13 indicate that the items had a significant variation in the ratings given by respondents. This shows that there was a significant difference of views among the participants regarding these items and their correlations with the constructs proposed.

#### b) HRIS usage-focused section

Item 19 in the second part of the survey scored significantly above the test value of 3 used for the analysis, with a mean of 4.24. The results are shown in table 8.14.

**Table 8.14***Mean Score Results for Item 19*

	Sample Size	Mean	Std. deviation	Std. error mean
19) To what extent do you think there is a need to make use of HRIS data?	106	4.24	0.952	0.092

### 8.5.2.2 One-sample t-test

#### a) HRIS conceptual model analysis

For the model being reviewed in the first part of the survey, the one-sample t-test was conducted to determine if the mean of the population was statistically different from the hypothesised value for the different items. The results indicated that for 55 of the 59 items in the model, it could be concluded that the population means were statistically significantly different ( $p < 0.05$ ), and that the null hypothesis could be rejected.

For all 55 of the remaining items, it could be concluded from the results that the item scores were statistically significantly higher than the test value score of 3. These ranged from the lowest point of item 6.5)  $t(117) = 3.736$ ,  $p = 0.000$  and by a mean of 0.364, 95% CI [0.17 to 0.56] to the highest point of item 10.6)  $t(117) = 28.372$ ,  $p = 0.000$  and by a mean of 1.517, 95% CI [1.41 to 1.62]. This had been anticipated because of the extensive literature review conducted, and which served as the basis for the model designed. Particularly notable items identified in the results included item 10.6)  $t(117) = 28.372$ ,  $p = 0.000$ , item 14.1)  $t(117) = 24.885$ ,  $p = 0.000$ , item 13.5)  $t(117) = 22.020$ ,  $p = 0.000$ , and item 12.3)  $t(117) = 20.733$ ,  $p = 0.000$ . The results are provided in table 8.15.

**Table 8.15***T-values for Model Items*

Items	T-value	Degrees of freedom	Sig. (2-tailed)	Mean difference	95% confidence interval of the difference	
					Lower	Upper
6.1) Low voluntary turnover is an indicator of higher job satisfaction	5.875	117	0.000	0.576	0.38	0.77
6.2) Low absenteeism is an indicator of higher job satisfaction	6.881	117	0.000	0.686	0.49	0.88
6.3) Organisational commitment is an indicator of higher job satisfaction	14.582	117	0.000	1.051	0.91	1.19
6.4) The content of a job enhances employees' job satisfaction	20.805	117	0.000	1.263	1.14	1.38
6.5) Higher pay is an indicator of higher job satisfaction	3.736	117	0.000	0.364	0.17	0.56
6.6) Job satisfaction is an indicator of organisational success	14.542	117	0.000	1.186	1.02	1.35
7.1) Low voluntary turnover is an indicator of higher organisational commitment	6.298	117	0.000	0.593	0.41	0.78
7.2) Low absenteeism is an indicator of higher organisational commitment	8.356	117	0.000	0.712	0.54	0.88
7.3) Job satisfaction is an indicator of higher organisational commitment	16.850	117	0.000	1.051	0.93	1.17
7.4) The implementation of total rewards elements enhances organisational commitment amongst employees	15.499	117	0.000	1.169	1.02	1.32
7.5) Organisational commitment is an indicator of organisational success	19.289	117	0.000	1.254	1.13	1.38
8.1) Technology used to support knowledge management is an indicator of effective knowledge management	16.545	117	0.000	1.051	0.93	1.18
8.2) Elements of a good knowledge management system are an indicator of effective knowledge management	18.609	117	0.000	1.068	0.95	1.18
8.3) Continuous professional development (CPD) activities within an organisation are an indicator of effective learning management	20.694	117	0.000	1.237	1.12	1.36
8.4) Job satisfaction is an indicator of effective organisational learning	13.033	117	0.000	0.966	0.82	1.11
8.5) Knowledge management is an indicator of organisational success	12.575	117	0.000	0.975	0.82	1.13
8.6) Organisational learning is an indicator of organisational success	20.638	117	0.000	1.220	1.10	1.34
9.1) The defined level described by the Capability Maturity Model (CMM) is an indicator of mature business processes within an organisation	12.723	117	0.000	0.847	0.72	0.98
9.2) Processes that have been mapped out are an indicator of business processes being mature within an organisation	9.816	117	0.000	0.763	0.61	0.92
9.3) An organisation that has structured itself to focus on process improvement is an indicator of business processes being mature within an organisation	15.245	117	0.000	1.119	0.97	1.26

9.4) Mature business processes are an indicator of organisational success	14.191	117	0.000	1.127	0.97	1.28
10.1) Job satisfaction is an indicator of a good organisational culture	14.747	117	0.000	1.034	0.90	1.17
10.2) Organisational commitment is an indicator of a good organisational culture	17.568	117	0.000	1.144	1.02	1.27
10.3) Innovation is an indicator of a good organisational culture	17.105	117	0.000	1.220	1.08	1.36
10.4) The effective utilisation of technological subsystems to turn inputs into outputs is an indicator of a good organisational culture	12.702	117	0.000	0.966	0.82	1.12
10.5) The extent to which different elements of the total reward framework are implemented according to occupational group preferences is an indicator of a good organisational culture	10.585	117	0.000	0.822	0.67	0.98
10.6) Effective leadership is an indicator of a good organisational culture	28.372	117	0.000	1.517	1.41	1.62
10.7) The clan/group culture type as described by the competing values framework is an indicator of a good organisational culture	11.700	117	0.000	0.881	0.73	1.03
10.8) Organisational culture is an indicator of organisational success	15.258	117	0.000	1.161	1.01	1.31
11.1) Job satisfaction is an indicator of transformational leadership	11.390	117	0.000	0.915	0.76	1.07
11.2) Organisational commitment is an indicator of transformational leadership	15.054	117	0.000	1.068	0.93	1.21
11.3) Organisational learning is an indicator of transformational leadership	18.544	117	0.000	1.144	1.02	1.27
11.4) A clearly defined purpose is an indicator of transformational leadership	20.505	117	0.000	1.280	1.16	1.40
11.5) Transformational leadership is an indicator of organisational success	18.602	117	0.000	1.288	1.15	1.43
12.1) Organisational citizenship behaviour is an indicator of ethical leadership	15.178	117	0.000	0.975	0.85	1.10
12.2) Corporate social responsibility is an indicator of ethical leadership	14.192	117	0.000	1.051	0.90	1.20
12.3) Ethical leadership is an indicator of organisational success	20.733	117	0.000	1.356	1.23	1.49
13.1) Enhanced employee performance is an indicator of ethical leadership	16.020	117	0.000	1.076	0.94	1.21
13.2) Work engagement is an indicator of ethical leadership	16.253	117	0.000	1.042	0.92	1.17
13.3) Organisational commitment is an indicator of ethical leadership	15.169	117	0.000	0.992	0.86	1.12
13.4) Reduced staff turnover is an indicator of ethical leadership	6.432	117	0.000	0.576	0.40	0.75
13.5) Increased trust is an indicator of authentic leadership	22.020	117	0.000	1.322	1.20	1.44
13.6) Authentic leadership is an indicator of organisational success	19.241	117	0.000	1.246	1.12	1.37

14.1) A good organisational culture is an indicator of an effective overall leadership influence	24.885	117	0.000	1.415	1.30	1.53
14.2) Overall leadership influence is an indicator of organisational success	22.376	117	0.000	1.364	1.24	1.49
15.1) The presence of an HRIS is an indicator that an organisation is on the path to better management of its human resources information	18.171	117	0.000	1.220	1.09	1.35
15.2) Usage of an HRIS by its users is an indicator of the effectiveness of the HRIS	13.772	117	0.000	1.076	0.92	1.23
15.3) A reduction in administration levels is an indicator of the effective use of an HRIS	17.027	117	0.000	1.153	1.02	1.29
15.4) Storing of information on an HRIS promotes access to information across the organisation	21.414	117	0.000	1.297	1.18	1.42
15.5) Analytics conducted using an HRIS is an indicator of the effective use of the HRIS	18.315	117	0.000	1.246	1.11	1.38
15.6) Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation	15.554	117	0.000	1.085	0.95	1.22
15.7) The effective use of an HRIS is an indicator of organisational success	16.004	117	0.000	1.144	1.00	1.29
16.1) Employee engagement is an indicator of organisational success	21.953	117	0.000	1.364	1.24	1.49
16.2) Change capability is an indicator of organisational success	21.060	117	0.000	1.305	1.18	1.43
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	7.146	117	0.000	0.686	0.50	0.88

b) HRIS usage-focused section

Item 19 was also reviewed using the one-sample t-test, and it was determined that it was statistically significantly higher than the normal score of 3  $t(106) = 13.369$ ,  $p = 0.001$  and had a mean difference of 1.24, 95% CI [1.05 TO 1.42], as indicated in table 8.16. This had been anticipated based on the literature review conducted, and it provided support for the need to utilise HRIS data.

**Table 8.16**

*T-value Results for Item 19*

	T-value	Degrees of freedom	Sig. (2-tailed)	Mean difference	95% Confidence interval of the difference	
					Lower	Upper
19) To what extent do you think there is a need to make use of HRIS data?	13.369	105	0.000	1.236	1.05	1.42



### 8.5.2.3 One-sample effect sizes

#### a) HRIS conceptual model analysis

For the purposes of interpretation, the results of the one-sample effect sizes statistical analysis conducted were used with the conventional effect sizes proposed by Cohen (1988) of 0.2 (small), 0.5 (moderate effect) and 0.8 (large effect). All the remaining 55 items in the model had a point estimate above 0.2, ranging from 0.326 at the lowest to 2.612 at the highest, indicating a medium to large effect size. The item with the largest effect size was 10.6) “Effective leadership is an indicator of a good organisational culture” (2.612). The results are contained in the second table in Annexure A.

#### b) HRIS usage-focused section

The second section focused on the need to use HRIS data, namely item 19. The effect size of this item was established using the same one-sample effect sizes t-test as the model but with a smaller population (n = 105). The item had a point estimate of 1.299, indicating a large effect size. The results are shown in table 8.17.

**Table 8.17**

*One-Sample Effect Size for Item 19*

Item		Standardiser <sup>a</sup>	Point estimate	95% confidence interval	
				Lower	Upper
19) To what extent do you think there is a need to make use of HRIS data?	Cohen's d	0.952	1.299	1.038	1.556
	Hedges' correction	0.959	1.289	1.031	1.545

## 8.6 Exploring group differences and relevance

In the survey sent out for data collection, participants were asked to provide feedback on their demographic details, namely age, education, race, gender and country of residence. The use of this information, however, was not a main aim of the study that sought primarily to build a model of the use of HRISs by providing an indication of organisational success based on measures. The main requirement for participation in the study was that the participants should be SMEs in their

respective fields in Human Capital and Operational Effectiveness Departments and could therefore provide meaningful and useful feedback and input on the proposed indicators and organisational success factors and not on their demographic information. The different demographic details were therefore not of specific importance to the researcher whose main concern was obtaining the input of SMEs.

To assess hypothesis H04 “There will be a significant difference between the biographical variables in moderating the use of HRIS to derive metrics and the measurement of organisational success factors”, item 15.6, “Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation” was analysed for two specific groups selected from the demographic details collected for analysis by the researcher, namely the age and education groups.

It is important to note that although the participants were asked to provide details on five demographic-related questions in the survey, only age and education were the focus in the third phase of the research for the statistical analysis conducted. The reason for the use of only these two demographic fields was that the focus of the research was primarily on the development of a model and not on the potential differences between groups. Any potential differences identified between the groups was therefore of no significance to the model the researcher was trying to develop as no model could be found on the topic to use and refine. Age and education, however, were chosen because the researcher thought they would be able to provide useful information on any potential differences between the groups, especially in relation to item 15.6, “Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation”.

### 8.6.1 Age

The first group evaluated for significant differences on items in the survey was age.

#### 8.6.1.1 Robust tests of equality of means and ANOVA – age

From the ANOVA output, the robust tests of equality of means were reviewed and analysed. The results are indicated in table 8.18

**Table 8.18**

*Robust Test of Equality of Means Results*

Item		Statistic	Degrees of freedom 1	Degrees of freedom 2	Significance
6.1) Low voluntary turnover is an indicator of higher job satisfaction	Brown-Forsythe	3.397	2	95.795	0.038
	Welch	3.807	2	52.215	0.027
10.2) Organisational commitment is an indicator of a good organisational culture	Brown-Forsythe	3.443	2	57.801	0.06
	Welch	4.926	2	77.104	0.010

The implications of the above results were that two items violated the assumption of the homogeneity of variance, specifically items 6.1) and 10.2). These items were identified as having a significance level above the threshold of 0.05 and therefore an adjusted F-ratio that was significant. The null hypothesis was therefore rejected for these two items, and it could be concluded that at least one or more of the group means was significantly different from the others for these items. These items were then further statistically analysed using the output from the ANOVA in the next section.

#### 8.6.1.2 ANOVA – age

From the output of the ANOVA, the two items, 6.1) and 10.2), were found to have significant results ( $p < 0.05$ ), as indicated in table 8.19.

**Table 8.19**

*ANOVA Results for Age*

Item		Sum of squares	Degrees of freedom	Mean square	F-ratio	Significance
6.1) Low voluntary turnover is an indicator of higher job satisfaction	Between groups	7.564	2	3.782	3.472	0.034
10.2) Organisational commitment is an indicator of a good organisational culture	Between groups	3.238	2	1.619	3.366	0.038

The implication of the significance of items 6.1) and 10.2) from the ANOVA results is that it could be concluded that there was a significant difference somewhere between the mean scores for the groups for these two dependent variables. The significance of the differences between the groups is discussed in the next section.

### 8.6.1.3 Post hoc follow-up test – age

Items 6.1) and 10.2) were reviewed in terms of the output of the post hoc follow-up test to determine the significance of the differences identified using the other results of the other statistical analysis conducted in this section. The results of the test are indicated in table 8.20.

**Table 8.20**

#### *Multiple Comparisons Post Hoc Test Results*

Dependent variable		(I) Age	(J) Age	Mean difference (I-J)	Std. error	Significance	95% Confidence interval	
							Lower bound	Upper bound
6.1) Low voluntary turnover is an indicator of higher job satisfaction	Bonferroni	25-34	45-64	-.649	0.248	0.030	-1.25	-0.05
		45-64	25-34	.649	0.248	0.030	0.05	1.25
	Games-Howell	25-34	45-64	-.649	0.259	0.040	-1.27	-0.02
		45-64	25-34	.649	0.259	0.040	0.02	1.27
10.2) Organisational commitment is an indicator of a good organisational culture	Bonferroni	25-34	35-44	-.429	0.169	0.038	-0.84	-0.02
		35-44	25-34	.429	0.169	0.038	0.02	0.84
	Games-Howell	25-34	35-44	-.429	0.155	0.022	-0.80	-0.05
		35-44	25-34	.429	0.155	0.022	0.05	0.80

Owing to the homogeneity of variances assumption being met for both items, the Bonferroni output was utilised for interpretation as follows:

Item 6.1:

- The 25 to 34 group was significantly different from the 45 to 64 group, with a mean difference of -.649 and p value of 0.030. The 45 to 64 group was identified as the most positive for this item between these two groups.

Item 10.2:

- The 25 to 34 group was significantly different from the 35 to 44 group with a mean difference of -.429 and p value of 0.038. The 35 to 44 group was identified as the most positive for this item between these two groups.

## 8.6.2 Education

The next group that was evaluated was the educational group to determine if there were any statistically significant differences among the items. The results of the analysis are discussed in this section.

### 8.6.2.1 Tests of homogeneity of variances – education

For the purposes of the research, only item 17.4 was found to be statistically significant ( $p < 0.05$ ), and the results are provided in table 8.21.

**Table 8.21**

#### *Tests of Homogeneity of Variances Results*

Item		Levene statistic	Degrees of freedom 1	Degrees of freedom 2	Significance
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	Based on mean	8.481	2	115	0.000
	Based on median	4.256	2	115	0.016
	Based on median with adjusted DF	4.256	2	106.273	0.017
	Based on trimmed mean	7.752	2	115	0.001

Based on the results, the assumption for homogeneity of variances for this item was not met and the robust tests of equality of means thus needed to be consulted for the further analysis in the next section.

### 8.6.2.2 Robust tests of equality of means – education

The results of the robust tests of equality of means were reviewed and analysed. Items 15.3, 17.4 and 19 were identified as having an adjusted F-ratio that was significant ( $p < 0.05$ ). The results are indicated in table 8.22.

**Table 8.22**

#### *Robust Tests of Equality of Means Results for Education*

Items		Statistic	Degrees of freedom 2	Degrees of freedom 2	Significance
15.3) A reduction in administration levels is an indicator of the effective use of an HRIS	Welch	6.110	2	49.798	0.004
	Brown-Forsythe	5.837	2	74.956	0.004
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	Welch	4.907	2	62.276	0.011
	Brown-Forsythe	5.518	2	110.302	0.005
19) To what extent do you think there is a need to make use of HRIS data?	Welch				
	Brown-Forsythe				

Based on the results, the null hypothesis was therefore rejected, and it was concluded that at least one or more of the group means were significantly different from the others for the items identified. These three items were then further statistically analysed using the results from the ANOVA and ANOVA effect size as explained in section 8.6.2.3.

### 8.6.2.3 ANOVA and ANOVA effect size – education

Items 15.3), 17.4) and 19) had a significance value of less than 0.05. The results are provided in table 8.23.

**Table 8.23**

#### *ANOVA Results for Education*

Item		Sum of squares	Degrees of freedom	Mean square	F-ratio	Significance
15.3) A reduction in administration levels is an indicator of the	Between groups	6.043	2	3.022	6.074	0.003

effective use of an HRIS						
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	Between groups	9.119	2	4.560	4.433	0.014
19) To what extent do you think there is a need to make use of HRIS data?	Between groups	6.426	2	3.213	3.732	0.027

The statistical significance identified in the results was that for the three items, there was a significant difference in the mean scores for the dependent variables of the survey among the groups. The statistical significance of the results is discussed in the next section on the multiple comparisons.

In terms of the effect sizes for the three items, they had values of 0.6 and above, indicating a medium effect size. The results are indicated in table 8.24.

**Table 8.24**

*ANOVA Effect Sizes Results for Education*

Item		Point estimate	95% confidence interval	
15.3) A reduction in administration levels is an indicator of the effective use of an HRIS	Eta-squared	0.096	0.012	0.197
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	Eta-squared	0.072	0.003	0.166
19) To what extent do you think there is a need to make use of HRIS data?	Eta-squared	0.087	0.006	0.192

*8.6.2.4 Post hoc follow-up test – education*

a) Games-Howell

Based on an analysis of the results of the post hoc follow-up test, the Games-Howell table was used owing to the violation of the assumption of homogeneity of variances for item 17.4) ( $p < 0.05$ ), in order to determine the significance of the differences identified from the results of the other statistical analysis conducted in this section. The results are indicated in table 8.25.

**Table 8.25**

*Post Hoc Follow-up Test Results using Games-Howell for Education*

Item		(I) Highest qualification	(J) Highest qualification	Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
							Lower bound	Upper bound
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	Games-Howell	Below matric   matric   A or O levels	UG	0.148	0.213	0.768	-0.37	0.66
			PG	.646*	0.216	0.011	0.13	1.17
		UG	Below matric   matric   A or O levels	-0.148	0.213	0.768	-0.66	0.37
			PG	0.499	0.212	0.053	-0.01	1.00
		PG	Below matric   matric   A or O levels	-.646*	0.216	0.011	-1.17	-0.13
			UG	-0.499	0.212	0.053	-1.00	0.01

The groups that were identified from the results as having significant differences were the below matric| matric| A or O levels group and the postgraduate group (PG) with a mean difference of .646 and a p value of 0.047. This indicates that the below matric| matric| A or O levels group was the more positive between the two groups on this item.

b) Bonferroni

For items 15.3) and 19), the assumption of homogeneity of variances was not violated. Hence the Bonferroni results were used to determine the significance of the differences identified using the other results of the other statistical analysis conducted in this section, specifically what the differences between the groups were. The results are indicated in table 8.26.

**Table 8.26**

*Post Hoc Follow-up Rest Results using Bonferroni for Education*

Item		(I) Highest qualification	(J) Highest qualification	Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
							Lower bound	Upper bound
15.3) A reduction in administra	Bonferroni	Below matric   matric   A or O levels	UG	-0.051	0.192	1.000	-0.52	0.42
			PG	-.486	0.183	0.027	-0.93	-0.04



tion levels is an indicator of the effective use of an HRIS		UG	Below matric   matric   A or O levels	0.051	0.192	1.000	-0.42	0.52
			PG	-.435	0.144	0.010	-0.79	-0.08
		PG	Below matric   matric   A or O levels	.486	0.183	0.027	0.04	0.93
			UG	.435	0.144	0.010	0.08	0.79
19) To what extent do you think there is a need to make use of HRIS data?	Bonferroni	Below matric   matric   A or O levels	UG	-0.378	0.274	0.513	-1.05	0.29
			PG	-.680	0.258	0.029	-1.31	-0.05
		UG	Below matric   matric   A or O levels	0.378	0.274	0.513	-0.29	1.05
			PG	-0.302	0.201	0.412	-0.79	0.19
		PG	Below matric   matric   A or O levels	.680	0.258	0.029	0.05	1.31
			UG	0.302	0.201	0.412	-0.19	0.79

Based on a review of the results, the following were identified:

Item 15.3:

- The below matric | matric | A or O levels group was significantly different from the postgraduate group, with a mean difference of -.486 and p value of 0.027. This indicates that the postgraduate group was the more positive between the groups reviewed for the item.
- The undergraduate group were significantly different from the postgraduate group, with a mean difference of -.435 and p value of 0.010. This indicates that the postgraduate group was the more positive between the groups reviewed for the item.

Item 19:

- The below matric | matric | A or O levels groups was significantly different from the postgraduate group with a mean difference of -.680 and p value of 0.029. This indicates that the postgraduate group was the more positive between the groups reviewed for the item.

Overall, it could be concluded for the items identified that where the educational level of participants increased, the more positively they reviewed the items that were highlighted as having significant different means.

Based on the statistical analysis conducted for the age and education groups using one-way ANOVA with a post hoc follow-up test, hypothesis H04 was rejected, and hypothesis Ha4 was accepted. This

was because no significant statistical differences were identified between the groups for age and education on item 15.6) “Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation”. The items in which significant statistical differences were identified did not impact the use of an HRIS on providing data and therefore did not influence the hypothesis.

The statistical results indicated that overall, the participants consistently believed that an HRIS could be used as an indicator of the presence of organisational success factors within an organisation without any differences between the groups analysed.

## 8.7 Correlations

For the correlation analysis, Kendall’s tau\_b nonparametric analysis was conducted. The results of the correlation analysis are discussed in this section.

### 8.7.1 Correlations – item level

#### 8.7.1.1 Job satisfaction

The construct of job satisfaction (JS) had several proposed indicators, and the correlation analysis was conducted to determine if there was a positive correlation between the proposed indicators and the measure in the survey on JS itself. The results of the correlation are provided in table 8.27.

**Table 8.27**

*Kendall’s tau\_b Results for Job Satisfaction*

Items		6.1)	6.2)	6.3)	6.4)	6.5)	6.6)
6.1) Low voluntary turnover is an indicator of higher job satisfaction	Correlation coefficient	--					
	Sig. (2-tailed)						
	n	118					
6.2) Low absenteeism is an indicator of higher job satisfaction	Correlation coefficient	.243**	--				
	Sig. (2-tailed)	0.002					
	n	118	118				
6.3) Organisational commitment is an	Correlation coefficient	.256**	.332**	--			

indicator of higher job satisfaction	Sig. (2-tailed)	0.001	0.000				
	n	118	118	118			
6.4) The content of a job enhances employees' job satisfaction	Correlation coefficient	.256**	0.161	.297**	--		
	Sig. (2-tailed)	0.002	0.051	0.000			
	n	118	118	118	118		
6.5) Higher pay is an indicator of higher job satisfaction	Correlation coefficient	.168*	0.114	0.105	.221**	--	
	Sig. (2-tailed)	0.031	0.145	0.192	0.007		
	n	118	118	118	118	118	
6.6) Job satisfaction is an indicator of organisational success	Correlation coefficient	0.075	.213**	.345**	.277**	.317**	--
	Sig. (2-tailed)	0.354	0.008	0.000	0.001	0.000	
	n	118	118	118	118	118	118
17.2) Older employees tend to be generally more satisfied with their jobs than younger employees	Correlation coefficient	0.042	0.099	0.064	0.031	0.073	.227**
	Sig. (2-tailed)	0.588	0.203	0.420	0.700	0.345	0.005
	n	118	118	118	118	118	118

Based on the results, one proposed indicator of JS was identified that did not correlate positively or significantly with item 6.6) on JS correlated to organisational success, specifically item 6.1) "Low voluntary turnover is an indicator of higher job satisfaction"  $r = .0075$ ,  $p > 0.05$ .

Indicator item 6.1) was removed from further statistical analysis. The other proposed indicators of JS all correlated positively and significantly ( $p < 0.05$ ), with the correlation coefficients of the items, ranging from 0.213 to 0.345, indicating a medium to strong association.

#### 8.7.1.2 Organisational commitment

The construct of organisational commitment (OC) had several proposed indicators, and a correlation analysis was conducted to determine if there was any positive correlation between the proposed indicators and the item in the survey, 7.5), on OC itself. The results are shown in table 8.28.

**Table 8.28**

*Kendall's tau<sub>b</sub> Results for Organisational Commitment*

Items		7.1)	7.2)	7.3)	7.4)	7.5)
	Correlation coefficient	--				

7.1) Low voluntary turnover is an indicator of higher organisational commitment	Sig. (2-tailed)					
	n	118				
7.2) Low absenteeism is an indicator of higher organisational commitment	Correlation coefficient	.389**	--			
	Sig. (2-tailed)	0.000				
	n	118	118			
7.3) Job satisfaction is an indicator of higher organisational commitment	Correlation coefficient	0.147	.204*	--		
	Sig. (2-tailed)	0.070	0.013			
	n	118	118	118		
7.4) The implementation of total rewards elements enhances organisational commitment amongst employees	Correlation coefficient	.217**	.268**	.327**	--	
	Sig. (2-tailed)	0.008	0.001	0.000		
	n	118	118	118	118	
7.5) Organisational commitment is an indicator of organisational success	Correlation coefficient	.219**	.292**	.463**	.419**	--
	Sig. (2-tailed)	0.008	0.000	0.000	0.000	
	n	118	118	118	118	118

The results showed that many of the measures for organisational commitment (OC) correlated positively and significantly with the item on OC and organisational success. These ranged from a correlation coefficient value of .219 to .463 ( $p < 0.05$ ), which indicated a medium to strong association between the proposed indicators. All the items were retained for further statistical analysis.

#### 8.7.1.3 Knowledge management

The possible indicators of the construct of knowledge management (KM) were analysed using correlation analysis. The results are shown in table 8.29.

**Table 8.29**

*Kendall's tau<sub>b</sub> Results for Knowledge Management*

Items		8.1)	8.2)	8.5)
8.1) Technology used to support knowledge management is an indicator of effective knowledge management	Correlation coefficient	--		
	Sig. (2-tailed)			
	n	118		
8.2) Elements of a good knowledge management system are an	Correlation coefficient	.551**	--	
	Sig. (2-tailed)	0.000		
	n	118	118	

indicator of effective knowledge management				
8.5) Knowledge management is an indicator of organisational success	Correlation coefficient	.437**	.524**	--
	Sig. (2-tailed)	0.000	0.000	
	n	118	118	118

Based on the results, both the proposed indicators correlated positively and significantly with item 8.5) on knowledge management and organisational success specifically, with a strong association and a correlation coefficient of  $r = .437$ ,  $p < 0.05$  and  $.524$ ,  $p < 0.05$ .

#### 8.7.1.4 Organisational learning

The possible measures of the construct of organisational learning (OL) were analysed. The results are provided in table 8.30.

**Table 8.30**

*Kendall's tau\_b Results for Organisational Learning*

Items		8.3)	8.4)	8.6)
8.3) Continuous professional development (CPD) activities within an organisation are an indicator of effective learning management	Correlation coefficient	--		
	Sig. (2-tailed)			
	n	118		
8.4) Job satisfaction is an indicator of effective organisational learning	Correlation coefficient	.418**	--	
	Sig. (2-tailed)	0.000		
	n	118	118	
8.6) Organisational learning is an indicator of organisational success	Correlation coefficient	.476**	.519**	--
	Sig. (2-tailed)	0.000	0.000	
	n	118	118	118

The results showed that both indicators proposed for the construct correlated positively and significantly with item 8.6) on organisational learning and organisational success, with a correlation coefficient of  $r = .476$  to  $.519$ ,  $p < 0.05$  indicating a strong association.

### 8.7.1.5 Mature business processes

Several possible indicators of the construct of mature business processes (MBP) were statistically tested. The results are provided in table 8.31.

**Table 8.31**

*Kendall's tau<sub>b</sub> Results for Mature Business Processes*

Items		9.1)	9.2)	9.3)	9.4)
9.1) The defined level described by the Capability Maturity Model (CMM) is an indicator of mature business processes	Correlation coefficient	--			
	Sig. (2-tailed)				
	n	118			
9.2) Processes that have been mapped out are an indicator of business processes being mature within an organisation	Correlation coefficient	.295**	--		
	Sig. (2-tailed)	0.000			
	n	118	118		
9.3) An organisation that has structured itself to focus on process improvement is an indicator of business processes being mature within an organisation	Correlation coefficient	.241**	.422**	--	
	Sig. (2-tailed)	0.004	0.000		
	n	118	118	118	
9.4) Mature business processes are an indicator of organisational success	Correlation coefficient	.233**	.353**	.513**	--
	Sig. (2-tailed)	0.005	0.000	0.000	
	n	118	118	118	118

All three of the possible indicators correlated positively and significantly with item 9.4) on MBP and organisational success ranging from correlation coefficients of  $r = .233$  to  $.513$ , indicating a medium to large association. The item with the highest correlation was 9.3) "An organisation that has structured itself to focus on process improvement is an indicator of business processes being mature within an organisation"  $r = .513$ ,  $p < 0.05$ .

### 8.7.1.6 Organisational culture

Organisational culture was a construct with the largest number of possible measures. The results are indicated in table 8.32.

**Table 8.32**

*Kendall's tau<sub>b</sub> Results for Organisational Culture*

Items		10.1)	10.2)	10.3)	10.4)	10.5)	10.6)	10.7)	10.8)

10.1) Job satisfaction is an indicator of a good organisational culture	Correlation coefficient	--							
	Sig. (2-tailed)								
	n	118							
10.2) Organisational commitment is an indicator of a good organisational culture	Correlation coefficient	.605**	--						
	Sig. (2-tailed)	0.000							
	n	118	118						
10.3) Innovation is an indicator of a good organisational culture	Correlation coefficient	.366**	.429*	--					
	Sig. (2-tailed)	0.000	0.000						
	n	118	118	118					
10.4) The effective utilisation of technological sub-systems to turn inputs into outputs is an indicator of a good organisational culture	Correlation coefficient	.351**	.388*	.592**	--				
	Sig. (2-tailed)	0.000	0.000	0.000					
	n	118	118	118	118				
10.5) The extent to which different elements of the total reward framework are implemented according to occupational group preferences is an indicator of a good organisational culture	Correlation coefficient	.205*	.331*	.322**	.495**	--			
	Sig. (2-tailed)	0.013	0.000	0.000	0.000				
	n	118	118	118	118	118			
10.6) Effective leadership is an indicator of a good organisational culture	Correlation coefficient	.251**	.398*	.213*	.229**	.331**	--		
	Sig. (2-tailed)	0.004	0.000	0.014	0.007	0.000			
	n	118	118	118	118	118	118		
10.7) The clan/group culture type as described by the Competing Values Framework is an indicator of a	Correlation coefficient	.237**	.305*	.213**	.302**	.228**	.259**	--	
	Sig. (2-tailed)	0.004	0.000	0.010	0.000	0.005	0.002		
	n	118	118	118	118	118	118	118	

good organisational culture									
10.8) Organisational culture is an indicator of organisational success	Correlation coefficient	.334**	.416*	.348**	.372**	.414**	.452**	.449**	--
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	n	118	118	118	118	118	118	118	118

Based on the results of the analysis, all seven possible indicators had a positive significant association with item 10.8) “Organisational culture is an indicator of organisational success”, ranging from a correlation coefficient of  $r = .334$  to  $.452$ ,  $p < 0.05$ . Item 10.7) “The clan/group culture type as described by the Competing Values Framework is an indicator of organisational culture” was the item with the largest positive significant association ( $r = .452$ ,  $p < 0.05$ ).

#### 8.7.1.7 Transformational leadership

Several leadership types were reviewed as part of the model, and the results of the correlation analysis for the construct of transformational leadership are provided in table 8.33.

**Table 8.33**

*Kendall's tau\_b Results for Transformational Leadership*

Items		11.1)	11.2)	11.3)	11.4)	11.5)
11.1) Job satisfaction is an indicator of transformational leadership	Correlation coefficient	--				
	Sig. (2-tailed)					
	n	118				
11.2) Organisational commitment is an indicator of transformational leadership	Correlation coefficient	.725**	--			
	Sig. (2-tailed)	0.000				
	n	118	118			
11.3) Organisational learning is an indicator of transformational leadership	Correlation coefficient	.628**	.645**	--		
	Sig. (2-tailed)	0.000	0.000			
	n	118	118	118		
11.4) A clearly defined purpose is an indicator of transformational leadership	Correlation coefficient	.487**	.470**	.546**	--	
	Sig. (2-tailed)	0.000	0.000	0.000		
	n	118	118	118	118	
11.5) Transformational leadership is an indicator of organisational success	Correlation coefficient	.530**	.553**	.515**	.590**	--
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	n	118	118	118	118	118



All four of the possible indicators of the construct of transformation leadership tested positive and had a significant large association with item 11.5) “Transformational leadership is an indicator of organisational success”, ranging from a correlation coefficient of  $r = .515$  to  $.590$ ,  $p < 0.05$ . The results were expected because of strong evidence in the literature for the possible indicators and the construct itself.

#### 8.7.1.8 Ethical leadership

The next type of leadership that was tested was that of the construct of ethical leadership with an analysis of possible measures and their correlation with item 12.3) “Ethical leadership is an indicator of organisational success”. The results are provided in table 8.34.

**Table 8.34**

*Kendall’s tau\_b Results for Ethical Leadership*

Items		8.3)	8.4)	8.6)
8.3) Continuous professional development (CPD) activities within an organisation are an indicator of effective learning management	Correlation coefficient	--		
	Sig. (2-tailed)			
	n	118		
8.4) Job satisfaction is an indicator of effective organisational learning	Correlation coefficient	.418**	--	
	Sig. (2-tailed)	0.000		
	n	118	118	
8.6) Organisational learning is an indicator of organisational success	Correlation coefficient	.476**	.519**	--
	Sig. (2-tailed)	0.000	0.000	
	n	118	118	118

Two possible indicators were tested, and both correlated positively and significantly with item 12.3) and had a large association with correlation coefficient values ranging from  $r = .452$  to  $.452$ ,  $p < 0.05$ .

#### 8.7.1.9 Authentic leadership

The final leadership type to be statistically tested was the construct of authentic leadership. Five possible measures were analysed using a correlation analysis with item 13.6) “Authentic Leadership is an indicator of organisational success”. The results are indicated in table 8.35.

**Table 8.35***Kendall's tau\_b Results for Authentic Leadership*

Items		13.1)	13.2)	13.3)	13.4)	13.5)	13.6)
13.1) Enhanced employee performance is an indicator of ethical leadership	Correlation coefficient	--					
	Sig. (2-tailed)						
	n	118					
13.2) Work engagement is an indicator of ethical leadership	Correlation coefficient	.603**	--				
	Sig. (2-tailed)	0.000					
	n	118	118				
13.3) Organisational commitment is an indicator of ethical leadership	Correlation coefficient	.486**	.607**	--			
	Sig. (2-tailed)	0.000	0.000				
	n	118	118	118			
13.4) Reduced staff turnover is an indicator of ethical leadership	Correlation coefficient	.424**	.439**	.364**	--		
	Sig. (2-tailed)	0.000	0.000	0.000			
	n	118	118	118	118		
13.5) Increased trust is an indicator of authentic leadership	Correlation coefficient	.361**	.401**	.442**	.289**	--	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		
	n	118	118	118	118	118	
13.6) Authentic leadership is an indicator of organisational success	Correlation coefficient	.331**	.395**	.477**	.368**	.567**	--
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	
	n	118	118	118	118	118	118

The results showed that all the indicators had a positive statistically significant medium to large association with item 13.6), with correlation coefficient values ranging from  $r = .331$  to  $.567$ ,  $p < 0.05$ . Item 13.5) "Increased trust is an indicator of authentic leadership" had the highest correlation coefficient of  $r = .567$ ,  $p < 0.05$ .

*8.7.1.10 Overall leadership Influence*

The last leadership construct analysed with correlation analysis was overall leadership influence (OLI). One possible indicator was analysed in terms of its correlation with item 14.2) "Overall leadership influence is an indicator of organisational success". The results are displayed in table 8.36.

**Table 8.36***Kendall's tau\_b Results for Overall Leadership Influence*

Items		14.1)	14.2)
-------	--	-------	-------

14.1) A good organisational culture is an indicator of an effective overall leadership influence	Correlation coefficient	--	
	Sig. (2-tailed)		
	n	118	
14.2) Overall leadership influence is an indicator of organisational success	Correlation coefficient	.697**	--
	Sig. (2-tailed)	0.000	
	n	118	118

The results indicated the positive statistically significant large association between the possible indicator and item 14.2), with a correlation coefficient of  $r = .697$ ,  $p < 0.05$ .

#### 8.7.1.11 Effective use of an HRIS

Based on the results of the correlation analysis, the possible indicators of the construct of HRIS, specifically item 15.7) “The effective use of HRIS is an indicator of organisational success”, were tested. The results are provided in table 8.37.

**Table 8.37**

*Kendall's tau\_b Results for an HRIS*

Items		15.1)	15.2)	15.3)	15.4)	15.5)	15.6) Data	15.7)
15.1) The presence of an HRIS is an indicator that an organisation is on the path to better management of its human resources information	Correlation coefficient	--						
	Sig. (2-tailed)							
	n	118						
15.2) Usage of an HRIS by its users is an indicator of the effectiveness of the HRIS	Correlation coefficient	.633**	--					
	Sig. (2-tailed)	0.000						
	n	118	118					
15.3) A reduction in administration levels is an indicator of the effective use of an HRIS	Correlation coefficient	.438**	.523**	--				
	Sig. (2-tailed)	0.000	0.000					
	n	118	118	118				
15.4) Storing of information on an HRIS promotes access to information across the organisation	Correlation coefficient	.564**	.634**	.653**	--			
	Sig. (2-tailed)	0.000	0.000	0.000				
	n	118	118	118	118			
15.5) Analytics conducted using an HRIS are an indicator	Correlation coefficient	.603**	.585**	.636**	.724**	--		
	Sig. (2-tailed)	0.000	0.000	0.000	0.000			

of the effective use of the HRIS	n	118	118	118	118	118		
15.6) Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation	Correlation coefficient	.513**	.578**	.422**	.585**	.618**	--	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		
	n	118	118	118	118	118	118	
15.7) The effective use of an HRIS is an indicator of organisational success	Correlation coefficient	.616**	.558**	.482**	.594**	.600**	.662**	--
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	
	n	118	118	118	118	118	118	118

Based on the results, all the proposed indicators positively, significantly correlated with item 15.7), ranging from a correlation coefficient of  $r = .482$  to  $.662$ ,  $p < 0.05$ . The item with the largest association was 15.6) “Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation” ( $r = .662$ ,  $p < 0.05$ ).

#### 8.7.1.12 Employee engagement and change capability

Two constructs that were added to the model without any proposed measures were employee engagement and change capability. These were identified as enhancements from the analysis in phase 2 of the research. The results are displayed in table 8.38.

**Table 8.38**

*Kendall's tau\_b Results for Employee Engagement and Change Capability*

Items		16.1)	16.2)
16.1) Employee engagement is an indicator of organisational success	Correlation coefficient	--	
	Sig. (2-tailed)		
	n	118	
16.2) Change capability is an indicator of organisational success	Correlation coefficient	.629**	--
	Sig. (2-tailed)	0.000	
	n	118	118

#### 8.7.1.13 Data extracted from an HRIS can be used to predict constructs

A critical item indicated to the participants for their view was whether data extracted from an HRIS could be used to predict constructs. This item, 15.6) “Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation”, was reviewed, in

terms of the correlations with other items on the constructs directly using the results of the correlation analysis. The results are displayed in table 8.39.

**Table 8.39**

*Kendall's tau\_b Results for Correlations between Item 15.6 and the Main Construct Items*

Items	6.6	75.	8.5	8.6	9.4	10.8	11.5	12.3	13.6	14.2	15.7	16.1	16.2
15.6	.342	.232	.392	.374	.263	.293	.310	.224	.363	.485	.662	.369	.407

The practical significance of the results was a medium to large positive association between the items in the survey on the constructs themselves and item 15.6). The correlation coefficients ranged from  $r = .232$  to  $.662$ ,  $p < 0.05$ . Item 15.7) on HRIS, and organisational success had the largest positive association ( $r = .662$ ,  $p < 0.05$ ).

## 8.8 Partial least squares-structural equation modelling (PLS-SEM)

As discussed in detail in chapter 6, section 6.7.8.2 f), PLS-SEM was used to test several hypotheses based on the initial aims of the research. The first part of the analysis involved the evaluation of the measurement model, while the second part dealt with the evaluation of the structural model. The evaluation of these two models and the various statistical analyses used are discussed in this section.

### 8.8.1 Measurement model assessment

Once the data had been gathered during the third phase of the research, it was uploaded into the software package, SmartPLS version 3.3.3 (Ringle et al., 2015). This software package assisted the researcher to construct and analyse the latent variables in the model using visual and various statistical analyses. The primary analysis conducted to evaluate the model was a review of the internal loadings of the indicators on their assigned construct, a review of the internal consistency of the model, the evaluation of the convergent validity, and finally an evaluation of the discriminant validity (Hair et al., 2017; Hair et al., 2019). Each of these evaluations is discussed in this section. A reflective model was chosen for the PLS-SEM analysis, based on the guidance provided by Hair et al. (2017), in section 6.7.8.2 f) in chapter 6, and the criteria used to make the decision to use a reflective model are now discussed in this section. .

Causal priority between the indicator and the construct was decided as being from the construct to the indicators, because the indicators identified in the literature were impacted by the underlying

construct, for example, organisational commitment would result in lower absenteeism. The constructs in the model were identified as traits explaining the indicator, whereas the indicators represented the consequences of the construct. It was determined that if the assessment of the trait changed, then all the items would change in a similar manner. The items themselves were identified as being mutually interchangeable as they were identified in the literature and the second phase of the research as possible indicators of the constructs – hence the possibility of there being other indicators.

### 8.8.1.1 Indicator loadings

The first item to be evaluated as part of the overall convergent validity of the measurement model was the item loadings of the indicators. This was evaluated using the outer loadings output from the PLS-SEM analysis for a reflective model. The guideline provided in chapter 6, section 6.7.8.2 f), was that indicator loadings of 0.708 and above would be recommended for a construct to explain 50% of the variation of the indicator. This was true for many of the indicators in the model. According to Hair et al. (2017), indicator loading values between 0.4 and 0.7, however, are acceptable for exploratory research. This was the case for several indicators' values being between the 0.4 and 0.7 range. The item outer loadings results are provided in table 8.40.

**Table 8.40**

#### *Item Outer Loadings Results*

	AL	CC	EE	EL	HRIS	MBP	OCJS	OCL	OLKM	OLI	TL
10.1								0,694			
10.2								0,741			
10.3								0,724			
10.4								0,765			
10.5								0,640			
10.8								0,680			
11.1											0,821
11.2											0,848
11.3											0,837
11.4											0,770
11.5											0,746
12.1				0,828							
12.2				0,806							
12.3				0,747							
13.1	0,707										
13.2	0,759										

13.3	0,810										
13.4	0,570										
13.5	0,741										
13.6	0,762										
14.1										0,913	
14.2										0,926	
15.1					0,787						
15.2					0,781						
15.3					0,738						
15.4					0,849						
15.5					0,860						
15.6					0,839						
15.7					0,843						
16.1			1,00								
16.2		1,00									
6.3							0,635				
6.4							0,612				
6.5							0,448				
6.6							0,763				
7.2							0,421				
7.3							0,672				
7.4							0,699				
7.5							0,788				
8.1									0,655		
8.2									0,815		
8.3									0,634		
8.4									0,660		
8.5									0,805		
8.6									0,810		
9.1						0,640					
9.2						0,700					
9.3						0,746					
9.4						0,813					

Item loadings for the model ranged from 0.421 to 0.926, with several indicators below the recommended threshold of 0.708. Indicators 6.5) and 7.2) were below 0.5 and indicator 13.4) below 0.6. Although these values appear to be unacceptable, the indicators were retained owing to the statistically significant composite reliability and rho\_A values of the constructs, as discussed later in this section, and the exploratory nature of the study (Hair et al., 2017).

### 8.8.1.2 Internal consistency reliability and convergent validity

The next step in the evaluation of the measurement model was to review the internal consistency reliability and convergent validity. The primary focus of internal consistency reliability is on the composite reliability values of the constructs. The results for the composite reliability and other items are provided in table 8.41.

**Table 8.41**

#### *Internal Consistency Reliability Results*

	<b>Cronbach's alpha</b>	<b>rho_A</b>	<b>Composite reliability</b>	<b>Average variance extracted (AVE)</b>
<b>Auth Leadership</b>	0,825	0,843	0,870	0,531
<b>Change Cpb</b>	1,000	1,000	1,000	1,000
<b>Emp Eng</b>	1,000	1,000	1,000	1,000
<b>Eth Leadership</b>	0,708	0,716	0,837	0,631
<b>HRIS</b>	0,916	0,925	0,932	0,664
<b>MBP</b>	0,703	0,721	0,817	0,529
<b>Org Comm &amp; JS</b>	0,788	0,819	0,844	0,412
<b>Org Culture</b>	0,801	0,806	0,858	0,502
<b>Org Lrn &amp; KM</b>	0,827	0,849	0,874	0,539
<b>Ovrl Leadership</b>	0,818	0,822	0,917	0,846
<b>Trans Leadership</b>	0,864	0,868	0,902	0,648

For most of the constructs, the Cronbach alpha, composite reliability and AVE were all above the recommended thresholds, as discussed in section 6.7.8.2 f) in chapter 6, of 0.6 and above (Cronbach alpha), 0.6 to 0.7 (composite reliability), and 0.5 and above (AVE). The Cronbach alpha value, however, was determined not to be the most appropriate measure for internal consistency reliability, and a greater focus was therefore placed on the composite reliability (Risher & Hair Jr, 2017). Two constructs, namely Emp Eng and Change Cpb, had a composite reliability value of 1.0, but the reason for this was that they were single item constructs – hence the decision to use other statistical measures to evaluate them (Hair et al., 2017). Because the composite reliability values for the remaining constructs were above the threshold of 0.7, it was determined that internal consistency had been established for the measurement model (Risher & Hair, 2017).

The next element for the evaluation of the measurement model was the determination of convergent validity. Two elements were primarily used to measure this, the first being the indicator outer loadings discussed in the first step of the measurement model evaluation in section 8.8.1.1,

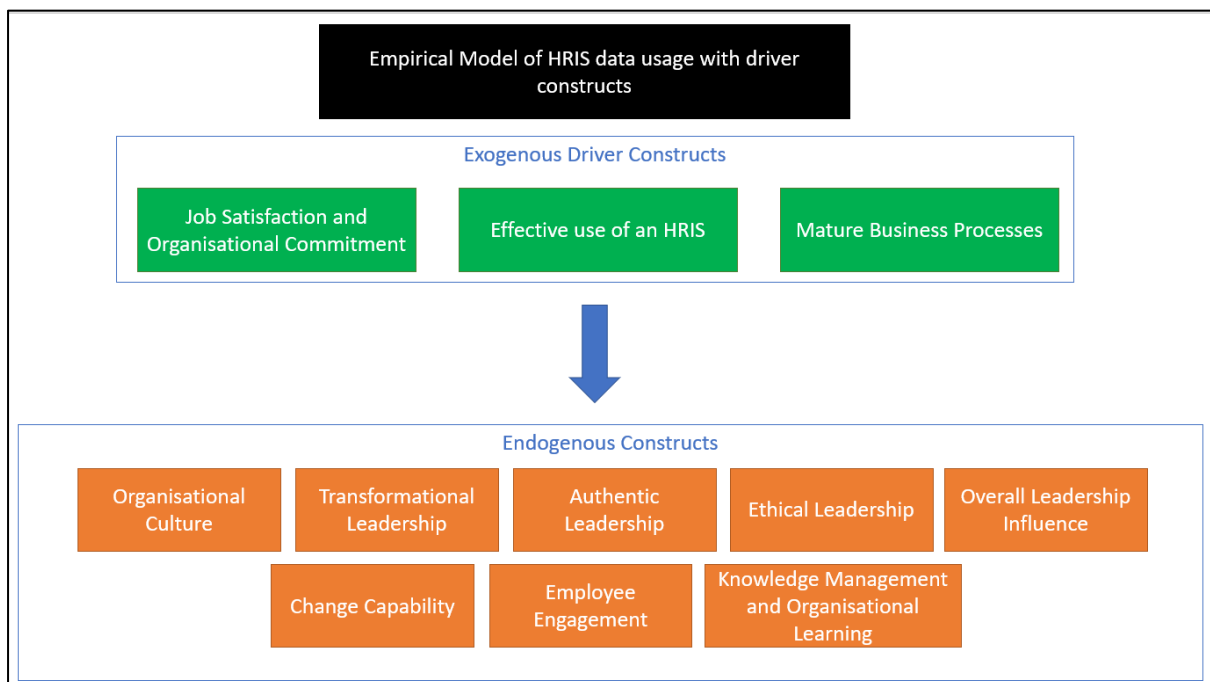


and the second the AVE value. For most of the constructs, the AVE was above the 0.5 threshold recommended, with only the construct Org Comm & JS having an AVE below the recommended threshold at 0.412. However, owing to the high composite reliability and rho\_A values for the Org Comms & JS construct, this was deemed acceptable for the purposes of the study and the construct was retained. The overall results from the item outer loadings discussed in the first step of the measurement model evaluation together with the AVE values therefore demonstrated that convergent validity for the measurement model was established for all the latent variables.

The high-level empirical model depicting the relationship between the driver constructs and the other constructs is depicted in figure 8.1, and the more detailed measurement model created based on the SmartPLS 3.3.3. output in figure 8.2.

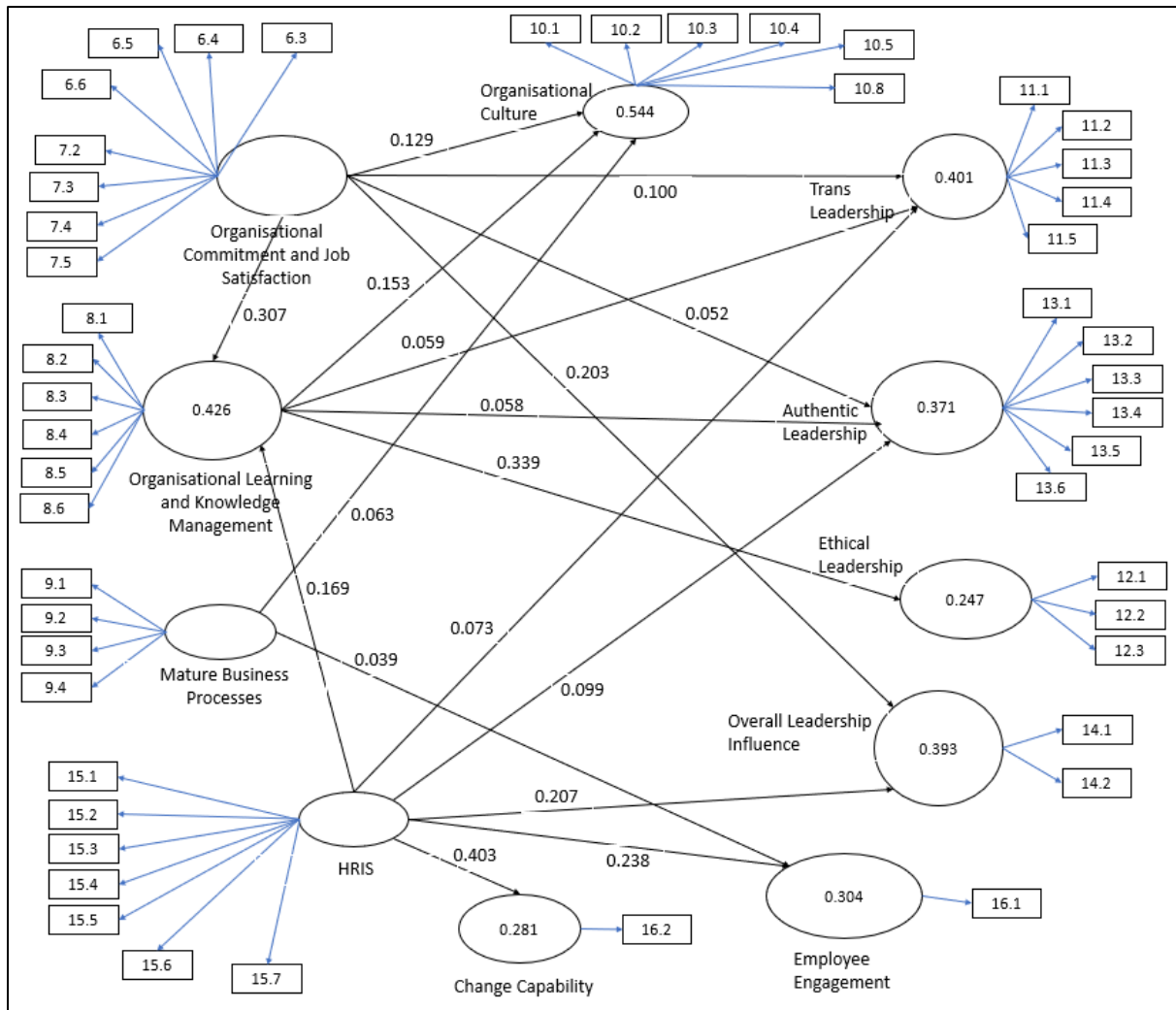
**Figure 8.1**

*High-level Empirical Model*



**Figure 8.2**

*Detailed Reflective Measurement Model Based on the Output from SmartPLS 3.3.3.*



The details of the model, the path relationships between the constructs and the results of the statistical analysis conducted are explained in detail in the remaining sections below.

### 8.8.1.3 Discriminant validity

The last element to be evaluated for the measurement model was discriminant validity. There are several traditional measures of discriminant validity for PLS-SEM, as discussed in section 6.7.8.2 f), namely the Fornell-Larcker criterion, cross-loadings and the HTMT. The Fornell-Larcker criterion and cross-loadings have been identified in recent years as not being best suited to establish discriminant validity, despite the cross-loading results shown in table 8.42. The primary focus in providing evidence of discriminant validity of the measurement model was the HTMT results contained in table 8.43 (Risher & Hair Jr, 2017).

Table 8.42

Item Cross-loadings Results

	Auth Leaders hip	Change Cpb	Emp Eng	Eth Leader ship	HRIS	MBP	Org Comm & JS	Org Culture	Org Lrn & KM	Ovrl Leader ship	Trans Leader ship
10.1	0,240	0,096	0,092	0,160	0,187	0,443	0,424	0,694	0,447	0,132	0,330
10.2	0,500	0,320	0,390	0,317	0,396	0,461	0,550	0,741	0,510	0,449	0,532
10.3	0,275	0,280	0,254	0,274	0,168	0,374	0,366	0,724	0,436	0,297	0,258
10.4	0,323	0,388	0,329	0,415	0,247	0,524	0,355	0,765	0,479	0,379	0,357
10.5	0,365	0,367	0,190	0,314	0,164	0,285	0,418	0,640	0,364	0,339	0,311
10.8	0,377	0,403	0,445	0,439	0,305	0,350	0,459	0,680	0,598	0,423	0,582
11.1	0,427	0,248	0,241	0,395	0,265	0,368	0,436	0,443	0,441	0,339	0,821
11.2	0,542	0,289	0,346	0,441	0,385	0,413	0,444	0,517	0,466	0,441	0,848
11.3	0,478	0,394	0,299	0,378	0,473	0,393	0,407	0,462	0,447	0,452	0,837
11.4	0,366	0,355	0,354	0,297	0,460	0,331	0,501	0,455	0,444	0,495	0,770
11.5	0,467	0,517	0,566	0,489	0,352	0,391	0,374	0,424	0,399	0,564	0,746
12.1	0,377	0,308	0,310	0,828	0,326	0,339	0,313	0,383	0,426	0,305	0,466
12.2	0,369	0,382	0,265	0,806	0,266	0,286	0,322	0,366	0,417	0,246	0,303
12.3	0,497	0,271	0,422	0,747	0,293	0,318	0,357	0,336	0,351	0,391	0,407
13.1	0,707	0,248	0,342	0,377	0,255	0,235	0,320	0,374	0,365	0,308	0,505
13.2	0,759	0,282	0,294	0,359	0,358	0,244	0,306	0,409	0,424	0,303	0,469
13.3	0,810	0,381	0,488	0,412	0,390	0,244	0,354	0,401	0,457	0,468	0,541
13.4	0,570	0,121	0,159	0,196	0,236	0,013	0,176	0,106	0,124	0,134	0,115
13.5	0,741	0,358	0,372	0,357	0,506	0,228	0,456	0,312	0,369	0,527	0,372
13.6	0,762	0,436	0,584	0,480	0,385	0,361	0,408	0,470	0,467	0,530	0,377
14.1	0,516	0,577	0,495	0,408	0,503	0,348	0,432	0,440	0,460	0,913	0,505
14.2	0,508	0,534	0,522	0,311	0,476	0,382	0,536	0,447	0,488	0,926	0,542
15.1	0,250	0,419	0,391	0,154	0,787	0,351	0,257	0,215	0,357	0,415	0,326
15.2	0,344	0,288	0,354	0,258	0,781	0,446	0,313	0,381	0,473	0,444	0,402
15.3	0,396	0,371	0,335	0,237	0,738	0,201	0,217	0,209	0,291	0,246	0,314
15.4	0,466	0,470	0,409	0,320	0,849	0,414	0,337	0,297	0,407	0,438	0,437
15.5	0,446	0,484	0,487	0,301	0,860	0,380	0,341	0,254	0,376	0,446	0,446
15.6	0,466	0,485	0,474	0,357	0,839	0,345	0,342	0,282	0,462	0,500	0,411
15.7	0,477	0,504	0,567	0,428	0,843	0,439	0,395	0,375	0,522	0,493	0,420
16.1	0,539	0,675	1,000	0,411	0,538	0,392	0,304	0,413	0,406	0,553	0,445
16.2	0,443	1,000	0,675	0,405	0,536	0,272	0,383	0,437	0,367	0,603	0,446
6.3	0,354	0,295	0,175	0,267	0,194	0,041	0,635	0,314	0,277	0,300	0,313
6.4	0,291	0,184	0,052	0,158	0,172	0,294	0,612	0,303	0,298	0,317	0,246
6.5	0,179	0,118	0,147	0,206	0,081	0,323	0,448	0,233	0,243	0,065	0,323
6.6	0,364	0,291	0,300	0,311	0,334	0,356	0,763	0,526	0,480	0,466	0,428
7.2	0,194	0,197	0,156	0,277	0,260	0,300	0,421	0,340	0,280	0,231	0,249
7.3	0,318	0,284	0,165	0,223	0,320	0,251	0,672	0,429	0,444	0,379	0,409
7.4	0,289	0,262	0,227	0,336	0,303	0,426	0,699	0,342	0,375	0,367	0,371
7.5	0,418	0,285	0,270	0,328	0,275	0,359	0,788	0,537	0,496	0,438	0,399
8.1	0,292	0,187	0,235	0,351	0,453	0,518	0,390	0,446	0,655	0,308	0,307
8.2	0,465	0,297	0,327	0,344	0,480	0,531	0,491	0,574	0,815	0,475	0,474

8.3	0,287	0,185	0,308	0,358	0,292	0,312	0,235	0,350	0,634	0,225	0,265
8.4	0,341	0,145	0,117	0,376	0,134	0,373	0,400	0,426	0,660	0,191	0,273
8.5	0,376	0,285	0,347	0,342	0,446	0,549	0,445	0,515	0,805	0,408	0,445
8.6	0,513	0,436	0,405	0,453	0,401	0,425	0,542	0,604	0,810	0,551	0,555
9.1	0,365	0,202	0,272	0,287	0,396	0,640	0,362	0,417	0,435	0,251	0,349
9.2	0,141	0,083	0,168	0,212	0,249	0,700	0,183	0,398	0,429	0,136	0,213
9.3	0,144	0,139	0,205	0,284	0,323	0,746	0,301	0,385	0,391	0,219	0,355
9.4	0,272	0,315	0,433	0,344	0,351	0,813	0,433	0,472	0,525	0,474	0,419

The results of the cross-loadings from the outer loadings output revealed that each indicator loaded most on its latent variable rather than any other latent variables in the model.

Table 8.43 indicates the results of the HTMT assessment for the latent variables.

**Table 8.43**

*HTMT Results for Latent Variables*

	AL	CC	EE	EL	HRIS	MBP	OCJS	OCL	OLKM	OLI	TL
AL											
CC	0,459										
EE	0,562	0,675									
EL	0,660	0,479	0,497								
HRIS	0,552	0,554	0,553	0,448							
MBP	0,416	0,303	0,442	0,549	0,559						
OCJS	0,562	0,425	0,331	0,558	0,443	0,625					
OCL	0,575	0,487	0,447	0,599	0,399	0,758	0,743				
OLKM	0,597	0,385	0,436	0,658	0,570	0,802	0,692	0,805			
OLI	0,631	0,668	0,611	0,522	0,605	0,489	0,627	0,587	0,597		
TL	0,644	0,482	0,483	0,638	0,536	0,590	0,650	0,669	0,623	0,677	

The results of the HTMT for the latent variables recorded were significantly below the threshold of 1.0 proposed by Henseler et al. (2016), and below the threshold of 0.85 for different constructs, and 0.9 for similar constructs (Risher & Hair Jr, 2017). There was thus a correlation between the cross-loading results and the HTMT results, with the HTMT supporting the cross-loading results depicted in table 8.44. The indicators for the constructs did not result in any issues relating to discriminant validity. Discriminant validity for the measurement model was therefore confirmed.

In addition to the standard HTMT output, bootstrapping was also conducted as an additional means of assessing the values at the 95% confidence interval for the HTMT. These results are shown in table 8.44.

Table 8.44

*Bootstrapping HTMT Results*

	Original sample (O)	Sample mean (M)	2.5%	97.5%
Change Cpb -> Auth Leadership	0.459	0.458	0.257	0.643
Emp Eng -> Auth Leadership	0.562	0.558	0.378	0.712
Emp Eng -> Change Cpb	0.675	0.670	0.500	0.808
Eth Leadership -> Auth Leadership	0.660	0.665	0.491	0.838
Eth Leadership -> Change Cpb	0.479	0.477	0.248	0.682
Eth Leadership -> Emp Eng	0.497	0.494	0.303	0.661
HRIS -> Auth Leadership	0.552	0.557	0.373	0.728
HRIS -> Change Cpb	0.554	0.547	0.341	0.717
HRIS -> Emp Eng	0.553	0.546	0.348	0.707
HRIS -> Eth Leadership	0.448	0.456	0.250	0.665
MBP -> Auth Leadership	0.416	0.454	0.307	0.629
MBP -> Change Cpb	0.303	0.315	0.144	0.515
MBP -> Emp Eng	0.442	0.442	0.263	0.618
MBP -> Eth Leadership	0.549	0.557	0.356	0.771
MBP -> HRIS	0.559	0.567	0.360	0.761
Org Comm & JS -> Auth Leadership	0.562	0.575	0.431	0.709
Org Comm & JS -> Change Cpb	0.425	0.429	0.253	0.597
Org Comm & JS -> Emp Eng	0.331	0.339	0.174	0.508
Org Comm & JS -> Eth Leadership	0.558	0.570	0.396	0.750
Org Comm & JS -> HRIS	0.443	0.457	0.300	0.615
Org Comm & JS -> MBP	0.625	0.652	0.490	0.810
Org Culture -> Auth Leadership	0.575	0.588	0.419	0.752
Org Culture -> Change Cpb	0.487	0.495	0.298	0.683
Org Culture -> Emp Eng	0.447	0.449	0.233	0.653
Org Culture -> Eth Leadership	0.599	0.608	0.382	0.822
Org Culture -> HRIS	0.399	0.415	0.242	0.604
Org Culture -> MBP	0.758	0.763	0.595	0.912
Org Culture -> Org Comm & JS	0.743	0.750	0.601	0.877
Org Lrn & KM -> Auth Leadership	0.597	0.604	0.443	0.749
Org Lrn & KM -> Change Cpb	0.385	0.387	0.196	0.568
Org Lrn & KM -> Emp Eng	0.436	0.436	0.247	0.602
Org Lrn & KM -> Eth Leadership	0.658	0.663	0.424	0.865
Org Lrn & KM -> HRIS	0.570	0.577	0.407	0.726
Org Lrn & KM -> MBP	0.802	0.804	0.667	0.927
Org Lrn & KM -> Org Comm & JS	0.692	0.697	0.541	0.839
Org Lrn & KM -> Org Culture	0.805	0.810	0.667	0.928
Ovrl Leadership -> Auth Leadership	0.631	0.631	0.471	0.780
Ovrl Leadership -> Change Cpb	0.668	0.666	0.524	0.792
Ovrl Leadership -> Emp Eng	0.611	0.604	0.425	0.751
Ovrl Leadership -> Eth Leadership	0.522	0.524	0.300	0.752
Ovrl Leadership -> HRIS	0.605	0.605	0.413	0.773
Ovrl Leadership -> MBP	0.489	0.494	0.302	0.671

<b>Ovrl Leadership -&gt; Org Comm &amp; JS</b>	0.627	0.633	0.467	0.778
<b>Ovrl Leadership -&gt; Org Culture</b>	0.587	0.589	0.384	0.772
<b>Ovrl Leadership -&gt; Org Lrn &amp; KM</b>	0.597	0.599	0.428	0.751
<b>Trans Leadership -&gt; Auth Leadership</b>	0.644	0.652	0.524	0.781
<b>Trans Leadership -&gt; Change Cpb</b>	0.482	0.480	0.277	0.653
<b>Trans Leadership -&gt; Emp Eng</b>	0.483	0.479	0.291	0.645
<b>Trans Leadership -&gt; Eth Leadership</b>	0.638	0.639	0.434	0.832
<b>Trans Leadership -&gt; HRIS</b>	0.536	0.535	0.369	0.689
<b>Trans Leadership -&gt; MBP</b>	0.590	0.594	0.417	0.755
<b>Trans Leadership -&gt; Org Comm &amp; JS</b>	0.650	0.650	0.481	0.796
<b>Trans Leadership -&gt; Org Culture</b>	0.669	0.669	0.500	0.818
<b>Trans Leadership -&gt; Org Lrn &amp; KM</b>	0.623	0.625	0.441	0.796
<b>Trans Leadership -&gt; Ovrl Leadership</b>	0.677	0.676	0.508	0.824

In terms of the results in table 8.44, all the values at 97.5% were below the proposed benchmark of 1.0, with only three being above the 0.9 benchmark proposed for conceptually similar constructs, namely Org Culture and MBP (0.912), Org Lrn & KM and MBP (0.927) and Org Lrn & KM and Org Culture (0.928). Although these values were above the proposed benchmark of conceptually similar constructs, they were retained owing to the exploratory nature of the study and the standard HTMT results being within the prescribed benchmarks.

Based on the results of the internal consistency reliability, convergent validity and the discriminant validity, hypothesis H02 “The constructs of HRIS, leadership, organisational culture, internal organisational processes and other constructs extracted from organisational performance models can be determined, and their key components can be measured” was accepted. The reason for this was the composite reliability for the constructs being established, thus confirming internal consistency reliability. The convergent validity was established as the indicator loading results for the measures of the constructs were within the range of 0.4 to 0.7 and the AVE values for many of the constructs were above the required threshold of 0.5, as proposed by Hair et al. (2017). Lastly, discriminant validity was confirmed as the item cross-loading results confirmed that the indicators loaded most significantly on their construct and the HTMT values were within the prescribed thresholds.

## 8.8.2 Structural model assessment

Once the evaluation of the measurement model had been completed and the different criteria established, the structural model needed to be evaluated. This section provides the results of the evaluation of the structural model using the previously discussed criteria in chapter 6.

### 8.8.2.1 Collinearity issues

The first item used to evaluate the structural model was collinearity assessment to determine if there were any collinearity issues with the latent variables. The results of the collinearity assessment are presented in table 8.45.

**Table 8.45**

*Collinearity Assessment Results*

	AL	CC	EE	EL	HRIS	MBP	OCJS	OCL	OLKM	OLI	TL
AL											
CC											
EE											
EL											
HRIS	1.382	1.000	1.265						1.182	1.182	1.382
MBP			1.265					1.659			
OCJS	1.545							1.551	1.182	1.182	1.545
OCL											
OLKM	1.773			1.000				1.994			1.773
OLI											
TL											

The results show that no collinearity issues were identified between the latent variables as all the values were below the threshold of 3 (Hair et al., 2011).

### 8.8.2.2 Significance and relevance of model relationships

Once it had been determined that there were no collinearity issues between the latent variables, the next criterion for the structural model's assessment entailed a review of the significance of the

relationships between the constructs themselves. This was achieved using bootstrapping, and the results are provided in table 8.46.

**Table 8.46**

*Results of Path Coefficients using Bootstrapping*

	Path coefficients	T-values	P-values
HRIS -> Auth Leadership	0.290	2.681	0.007
HRIS -> Change Cpb	0.536	5.908	0.000
HRIS -> Emp Eng	0.453	4.391	0.000
HRIS -> Org Lrn & KM	0.335	4.121	0.000
HRIS -> Ovrl Leadership	0.383	4.239	0.000
HRIS -> Trans Leadership	0.242	2.565	0.010
MBP -> Emp Eng	0.185	2.136	0.033
MBP -> Org Culture	0.215	2.630	0.009
Org Comm & JS -> Auth Leadership	0.222	2.321	0.020
Org Comm & JS -> Org Culture	0.298	3.871	0.000
Org Comm & JS -> Org Lrn & KM	0.452	5.746	0.000
Org Comm & JS -> Ovrl Leadership	0.378	4.481	0.000
Org Comm & JS -> Trans Leadership	0.300	2.855	0.004
Org Lrn & KM -> Auth Leadership	0.252	2.622	0.009
Org Lrn & KM -> Eth Leadership	0.503	6.261	0.000
Org Lrn & KM -> Org Culture	0.369	4.388	0.000
Org Lrn & KM -> Trans Leadership	0.248	2.248	0.025

The analysis was completed at the two-tailed 0.05% significance level with the corresponding t-value threshold being 1.96 in determining if the results were statistically significant (Hair et al., 2017). Based on the results, all the relationships were found to be positive and statistically significant, ranging from the smallest effect size between MBP and Emp Eng ( $B = 0.185$ ;  $t = 2.136$ ;  $p = 0.033$ ) to the largest between HRIS and Change Cpb ( $B = 0.536$ ;  $t = 5.908$ ;  $p = 0.000$ ). Using Cohen's (1988) guidance on interpreting the effect sizes between the constructs, it could be concluded that they were positive and statistically significant, and ranged from small to medium. Table 8.46 indicates the relationships between the constructs along with the path coefficients, p, and t values.

As another means of interpreting the results, the confidence intervals for the bootstrapping were reviewed at the 0.05% significance level. These results are contained in table 8.47.

**Table 8.47**

*Bootstrapping Confidence Intervals Results*

	Original sample (O)	Sample mean (M)	2.5%	97.5%
HRIS -> Auth Leadership	0,290	0,290	0,062	0,491



HRIS -> Change Cpb	0,536	0,532	0,341	0,694
HRIS -> Emp Eng	0,453	0,449	0,232	0,640
HRIS -> Org Lrn & KM	0,335	0,335	0,171	0,492
HRIS -> Ovrl Leadership	0,383	0,383	0,206	0,552
HRIS -> Trans Leadership	0,242	0,239	0,053	0,424
MBP -> Emp Eng	0,185	0,191	0,017	0,361
MBP -> Org Culture	0,215	0,229	0,071	0,389
Org Comm & JS -> Auth Leadership	0,222	0,220	0,028	0,406
Org Comm & JS -> Org Culture	0,298	0,299	0,142	0,444
Org Comm & JS -> Org Lrn & KM	0,452	0,460	0,298	0,607
Org Comm & JS -> Ovrl Leadership	0,378	0,382	0,210	0,542
Org Comm & JS -> Trans Leadership	0,300	0,304	0,088	0,501
Org Lrn & KM -> Auth Leadership	0,252	0,260	0,073	0,453
Org Lrn & KM -> Eth Leadership	0,503	0,515	0,347	0,657
Org Lrn & KM -> Org Culture	0,369	0,364	0,191	0,522
Org Lrn & KM -> Trans Leadership	0,248	0,251	0,044	0,474

Based on the bootstrapping confidence intervals results for the path coefficients, the findings of the standard PLS algorithm confirmed that all the relationships between the constructs were positive and statistically significant.

Another evaluation criterion used to assess the structural model more frequently in research is the total effect (Hair et al., 2017). This output is designed to provide all the effects a construct has, that is, both direct and indirect, and it is particularly useful when evaluating the impact of independent constructs on dependent constructs in the model. The results of the total effect are presented in table 8.48.

**Table 8.48**

*Total Effects Results*

	AL	CC	EE	EL	HRIS	MBP	OCJS	OCL	OLKM	OLI	TL
AL											
CC											
EE											
EL											
HRIS	0,374	0,536	0,453	0,169				0,124	0,335	0,383	0,325
MBP			0,185					0,215			
OC JS	0,335			0,227				0,464	0,452	0,378	0,412
OCL											
OLKM	0,252			0,503				0,369			0,248
OLI											
TL											

The results show the driver constructs in the model of HRIS, OC JS and MBP and the effects they have, both indirect and direct, on the other constructs. One can therefore conclude that the driver constructs had a statistically significant effect on several constructs in the model.

Based on the results of the item frequencies, the evaluation of the measurement model using internal consistency reliability, convergent validity and discriminant validity, hypothesis H03 “The empirical relationship between the construct HRIS and measures based on organisational success factors can be determined and tested through statistical analysis” was accepted. The results indicated that the empirical relationship between HRIS and measures derived from OSFs was determined and tested. This was because item 15.6) on HRIS and data drawn from it could be used to provide an indication of the presence of OSFs within an organisation, with an agreement level of 82.2%. Additionally, the path coefficients for the relationships between the constructs and the driver construct, HRIS, were found to be statistically significant, specifically when reviewing the results of the total effects indicated in table 8.48, which identified HRIS and two other constructs as driver constructs in the model that was tested.

### 8.8.2.3 Coefficient of determination (R squared)

Once the significance and strength of the path coefficients had been determined and confirmed, the next evaluation criterion for the structural model was the coefficient of determination. This measure is the most commonly used means to evaluate the structural model, and indicates the percentage of variance accounted for of the endogenous constructs by the independent constructs in the model (Henseler et al., 2016). The results are provided in table 8.49.

**Table 8.49**

#### *Coefficient of Determination Results*

	<b>R squared</b>	<b>R squared adjusted</b>
<b>Auth Leadership</b>	0.387	0.371
<b>Change Cpb</b>	0.287	0.281
<b>Emp Eng</b>	0.316	0.304
<b>Eth Leadership</b>	0.253	0.247
<b>Org Culture</b>	0.555	0.544
<b>Org Lrn &amp; KM</b>	0.436	0.426
<b>Ovrl Leadership</b>	0.403	0.393
<b>Trans Leadership</b>	0.416	0.401

According to the results in table 8.49, the coefficient of determination R squared values ranged from the smallest, 0.253 for Eth Leadership, to the largest, 0.555 for Org Culture. This indicates that 25.3% to 55.5% of the variance of these endogenous constructs was explained by the relationships specified between the different constructs in the model. The results indicated a weak to moderate level of predictive power of the endogenous constructs. This was deemed significant for the study as the indicators and constructs in the first and second phases of the research were suggested as a possible list and therefore did not include all the potential indicators and constructs. However, they were still able to provide some degree of predictive power, which was an aim of the research.

#### 8.8.2.4 F squared

The next step in the evaluation of the structural model was the use of the F squared value to evaluate the impact of removing an exogenous construct from the model and to determine if the construct had a significant impact on the endogenous constructs in the model (Wong, 2013). The F squared values for the exogenous constructs in the model are indicated in table 8.50.

**Table 8.50**

*Path Coefficients and F Squared Results*

	Path coefficients	T-values	P-values	F squared
HRIS -> Auth Leadership	0.290	2.681	0.007	0.099
HRIS -> Change Cpb	0.536	5.908	0.000	0.403
HRIS -> Emp Eng	0.453	4.391	0.000	0.238
HRIS -> Org Lrn & KM	0.335	4.121	0.000	0.169
HRIS -> OvrL Leadership	0.383	4.239	0.000	0.207
HRIS -> Trans Leadership	0.242	2.565	0.010	0.073
MBP -> Emp Eng	0.185	2.136	0.033	0.039
MBP -> Org Culture	0.215	2.630	0.009	0.063
Org Comm & JS -> Auth Leadership	0.222	2.321	0.020	0.052
Org Comm & JS -> Org Culture	0.298	3.871	0.000	0.129
Org Comm & JS -> Org Lrn & KM	0.452	5.746	0.000	0.307
Org Comm & JS -> OvrL Leadership	0.378	4.481	0.000	0.203
Org Comm & JS -> Trans Leadership	0.300	2.855	0.004	0.100
Org Lrn & KM -> Auth Leadership	0.252	2.622	0.009	0.058
Org Lrn & KM -> Eth Leadership	0.503	6.261	0.000	0.339
Org Lrn & KM -> Org Culture	0.369	4.388	0.000	0.153
Org Lrn & KM -> Trans Leadership	0.248	2.248	0.025	0.059

Table 8.50 indicates that the F squared values ranged from the smallest, at 0.039 for the relationship between MBP and Emp Eng to the largest at 0.403 between HRIS and Change Cpb. According to Cohen (1992), values of 0.02, 0.15 and 0.35 represent small, medium and large effects of the exogenous latent variable. Based on Cohen’s guideline, the results can be interpreted as confirming a small to large effect of all the relationships between the exogenous and endogenous latent variables.

#### 8.8.2.5 Predictive relevance

Once the in-sample predictive power of the model has been determined, the next step is to determine the out-of-sample predictive power. This is achieved using the blindfolding procedure, specifically cross-validated redundancy, where the Q squared values are used to determine the predictive accuracy (Hair et al., 2019; Henseler et al., 2016). The results of this procedure are provided in table 8.51.

**Table 8.51**

#### *Blindfolding Results*

	Sum of squared observations (SSO)	Sum of squared prediction errors (SSE)	Q squared (=1-SSE/SSO)
<b>Auth Leadership</b>	708.000	580.125	0.181
<b>Change Cpb</b>	118.000	90.662	0.232
<b>Emp Eng</b>	118.000	86.858	0.264
<b>Eth Leadership</b>	354.000	299.816	0.153
<b>HRIS</b>	826.000	826.000	
<b>MBP</b>	472.000	472.000	
<b>Org Comm &amp; JS</b>	944.000	944.000	
<b>Org Culture</b>	708.000	527.272	0.255
<b>Org Lrn &amp; KM</b>	708.000	550.200	0.223
<b>Ovrl Leadership</b>	236.000	158.893	0.327
<b>Trans Leadership</b>	590.000	440.165	0.254

Hair et al. (2017) postulated that values larger than 0 indicate that the model has predictive relevance. When reviewing the endogenous constructs in the model, the Q squared values ranged from 0.153 for Eth Leadership to 0.327 for Ovrl Leadership. This indicated the model’s predictive relevance.

### 8.8.2.6 Model fit using standardised root mean squared residual (SRMR)

As discussed in section 6.7.8.2 f), the SRMR is a relatively new way of assessing model fit with PLS-SEM. Hu and Bentler (1999) and Wong (2013) proposed a value of less than 1.0 or 0.08 for a more conservative view as being acceptable for model fit. The results of the model fit are shown in table 8.52.

**Table 8.52**

*Standardised Root Mean Residual (SRMR) Results*

	<b>Saturated model</b>	<b>Estimated model</b>
<b>SRMR</b>	0.088	0.106

For the overall model fit, the SRMR for the saturated model was found to be below the 0.1 recommended by Hu and Bentler (1999) and Wong (2013). Hence, with caution, the model could be indicated as acceptably fitting the data.

Based on the overall results of the measurement and structural model evaluations, hypothesis H05 “An empirical model for HRIS and measures can be created and tested using structural equation modelling on organisational success factors” was therefore accepted. This was because the results for all the evaluation criteria were within the acceptable ranges and thresholds and/or based on a strong theoretical foundation with other statistical support. The implications here are a model that should enable industrial and organisational psychologists and organisational development practitioners to utilise HRIS-related data to help them establish, to an extent, the presence of constructs correlated to organisational success.

## 8.9 Discussion of results

Based on the various descriptive and inferential statistical analyses utilised for the study, the results were obtained. The results of the statistical analysis conducted for the mean, frequency analysis, one-sample t-test, one-way between-groups ANOVA, correlation analysis, reliability analysis and measurement and structural models were all reported.

The one-way ANOVA between-groups statistical analysis was conducted to determine if there were any significant differences between the age and educational groups, with a specific focus on item 15.6) of the survey regarding the use of HRIS-extracted data providing an indication on OSFs within

an organisation. The results were discussed in section 8.6 of this chapter, and the finding it was that there was only a small number of items in which there was a statistically significant difference between the age and education groups analysed. Summarising the results of the one-way ANOVA between-groups with post hoc tests, the following was evident using the Bonferroni output for age:

- There was a statistically significant difference between the age group means for the 25 to 34 and 45 to 64 groups for the item 6.1) “Low voluntary turnover is an indicator of higher job satisfaction”. The 45 to 64 age group was found to be more positive and therefore rated this item higher than the 25 to 34 group. The implications were that the younger participants did not view low voluntary turnover as being as good an indicator of higher job satisfaction as the older participants.
- There was a statistically significant difference between the age groups means for the 25 to 34 and 35 to 44 groups for the item 10.2) “Organisational commitment is an indicator of a good organisational culture”. The 35 to 44 group was found to be more positive and therefore rated this item higher than the 25 to 34 group. The implications were that the younger participants did not view organisational commitment as high an indicator of good organisational culture as the older participants.

When summarising the results for education, both the Games-Howell and Bonferroni outputs were used for the items found to be statistically significant and are summarised as follows:

- Using the Games-Howell output, there was a statistically significant difference between the education groups means for the groups below matric | matric | A or O levels and postgraduate for the item 17.4) “Older employees tend to show higher levels of organisational commitment than younger employees”. The education group, below matric | matric | A or O levels was found to be more positive and therefore rated this item higher than the postgraduate group. The implications were that participants who were less educated viewed older employees as having higher levels of organisational commitment than the more educated participants.
- Using the Bonferroni output, two further items, namely 15.3) “Reduction in administration levels is an indicator of the effective use of an HRIS”, and 19) “To what extent do you think there is a need to make use of HRIS data?” were found to be statistically significant.
  - For item 15.3), three groups were found to have significant mean differences. The below matric | matric | A or O levels had a significantly lower mean than the postgraduate group. The implications were that the postgraduate group agreed to a greater extent that a reduction in administration levels was an indicator of effective use of an HRIS than the below matric | matric | A or O levels group. The undergraduate group had a significantly lower

mean than the postgraduate group. Again, this indicated that the postgraduate group agreed to a greater extent that a reduction in administration levels was an indicator of effective use of an HRIS than the undergraduate group

- For item 19), two groups were found to be significantly different with regard to their means, namely the below matric | matric | A or O levels and postgraduate groups. The former group had a significantly lower mean than the latter group, indicating that the more educated participants believed that HRIS data should be used to a greater extent than the less educated participants.

The main item of review, however, when reviewing the differences between the age and education groups, was item 15.6 “Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation”. This was not one of the items identified as having a statistically significant difference in terms of the groups’ means and therefore hypothesis H04 “There will be a significant difference between the biographical variables in moderating the use of HRIS to derive metrics and the measurement of organisational success factors” was rejected. Hypothesis Ha4 “There will be no significant difference between the biographical variables in moderating the use of HRIS to derive metrics and the measurement of organisational success factors” was accepted.

There were initially 13 constructs proposed for the reflective model, along with their indicators, based on the data gathered from phases 1, 2 and 3 of the research conducted prior to developing the model. The constructs results are indicated in tables 8.6 and 8.7. The primary analysis completed to evaluate the model and determine construct validity was a review of the internal loadings of the indicators on their assigned construct, a review of the internal consistency of the model, the evaluation of the convergent validity, and lastly, an evaluation of the discriminant validity (Hair et al., 2017; Hair et al., 2019). This was supported by the reliability analysis conducted. However, a number of issues were identified with some of the proposed constructs, indicators and the path relationships. The following issues and significant changes were then made:

- The JS and Org Comm constructs were combined into a single construct referred to as Org Comm & JS, and items 6.2 and 7.1 were removed because the indicator loadings were below 0.4, as recommended by Hair et al (2017).
- Based on the path coefficients, the relationship envisioned between the Org Comm & JS combined construct and the construct Emp Eng was reviewed, and then removed ( $p > 0.05$ ).
- Owing to discriminant issues, the constructs, KM and OL, were also combined into a single construct referred to as Org Lrn & KM.

- The relationship between this combined Org Lrn & KM construct and the constructs, Emp Eng and Change Cpb, was removed after reviewing the path coefficient results ( $p > 0.05$ ).
- The constructs, Emp Eng and Change Cpb, were analysed and discriminant and indicator loading issues identified. These constructs were therefore reduced to single item constructs based solely on the statement initially included for each in the survey for review.

The empirical relationship between the driver constructs human resource information systems, organisational commitment and job satisfaction, and mature business processes, were then reviewed with the endogenous latent variables in section 8.8.2.2 of this chapter. The results, including the relationships, are contained in figures 8.1 and 8.2 and tables 8.46 and 8.47 for the reflective measurement model. All the path relationships were found to be positively statistically significant. The total effects results in table 8.48 revealed significant relationships between HRISs specifically and the endogenous latent variables in the model. Based on the statistical analysis, hypotheses H02, H03, and H05 were accepted, while hypothesis H04 was rejected, with hypothesis Ha4 being accepted.

## 8.10 Summary of research hypotheses

The last section in this chapter provides a summary of the initial research hypotheses as set out in table 8.53.

**Table 8.53**

### *Research Hypotheses Formulated*

Hypothesis	Hypotheses accepted
<b>Hypothesis 01:</b> A statistically significant questionnaire to measure the need for the use of HRIS data and measure the measures of organisational success factors and the factors themselves can be developed.	Accepted
<b>Hypothesis a1:</b> A statistically significant questionnaire to measure the need for the use of HRIS data and measure the measures of organisational success factors and the factors themselves cannot be developed.	Rejected
<b>Hypothesis 02:</b> The constructs of HRIS, leadership, organisational culture, internal organisational processes and other constructs extracted from organisational performance models can be determined, and their key components can be measured.	Accepted



<b>Hypothesis a2:</b> The constructs of HRIS, leadership, organisational culture, internal organisational processes and other constructs extracted from organisational performance models cannot be determined, and their key components cannot be measured.	Rejected
<b>Hypothesis 03:</b> The empirical relationship between the construct of HRIS and measures based on organisational success factors can be determined and tested through statistical analysis.	Accepted
<b>Hypothesis a3:</b> The empirical relationship between the construct of HRIS and measures based on organisational success factors cannot be determined and tested through statistical analysis.	Rejected
<b>Hypothesis 04:</b> There will be a significant difference between the biographical variables in moderating the use of an HRIS to derive metrics and the measurement of organisational success factors.	Rejected
<b>Hypothesis a4:</b> There will be no significant difference between the biographical variables in moderating the use of an HRIS to derive metrics and the measurement of organisational success factors.	Accepted
<b>Hypothesis 05:</b> An empirical model for an HRIS and measures can be created and tested using structural equation modelling on organisational success factors.	Accepted
<b>Hypothesis a5:</b> An empirical model for an HRIS and measures cannot be created and tested using structural equation modelling on organisational success factors.	Rejected

## 8.11 Chapter summary

This chapter dealt with the results of the third phase of the study, which focused specifically on the quantitative analysis. The sample used for the research was initially described and then divided into the different demographic details collected from the participants. The next section explained the validity and reliability of the results. The constructs created and their definitions were provided. The univariate and group statistics conducted were then analysed and explained. The correlation analysis performed on the various items in the survey was reviewed and discussed. The constructs and their indicators proposed, and the reliability analysis used to confirm many of them, were explained. The next step was a discussion of the PLS-SEM measurement and structural model evaluation. The results were then interpreted in order to review the hypotheses formulated, and a decision made as to whether they were accepted or rejected, based on the statistical analysis.

Chapter 9 focuses on the conclusions drawn, the limitations of the study and recommendations for possible future research.

## Chapter 9: Conclusions, limitations and recommendations

### 9.1 Introduction

Chapter 8 explained the results of phase 3 of the research, which dealt specifically with the quantitative analysis and empirical research for the study, as per the research design explained in section 1.9, chapter 1. This final chapter focuses on the conclusions, limitations and recommendations, as per the outline of the thesis provided in chapter 1, section 1.10.

The first element to be discussed in this chapter is the conclusions that were drawn on the basis of the different phases of the study, focusing specifically on the theoretical and empirical aims. The next element to be discussed is the limitations of the study, while the third element makes recommendations for future research and for industrial and organisational psychologists and organisational development practitioners.

### 9.2 Conclusions

The study was subdivided into three distinct phases. The first was a review of the literature to identify the OSFs and compile a list of possible measures that could be built into a model from which data could be extracted from an HRIS and used with the identified measures to provide an indication of the presence of OSFs in an organisation. The next phase was the qualitative data collection and analysis in which the model that had been created was refined with input from SMEs. This was followed by an exploration of the need to use HRIS data. The final phase was the quantitative data collection and analysis where the conceptual model that had been developed was tested using structural equation modelling (SEM).

The main aim of the research was specified in chapter 1, section 1.4.1, namely to develop an empirical model for HRIS and measures by means of structural equation modelling on organisational success factors. This aim was realised because the specific aims for the research, as specified in chapter 1, section 1.4.3, were achieved. The achievement of each of the aims was discussed in this section of the literature review and the empirical parts of the study. The achievement of the aims of the research also allowed for the general research question specified in section 1.4.2 to be attained.

### 9.2.1 Literature review aims and conclusions

The first phase of the research focused on a review of the literature and presented possible OFSs and their measures that had been identified. The specific research aims for the literature review are discussed in this section.

#### 9.2.1.1 *To provide background on HRISs in South Africa*

This aim was achieved in chapter 2, specifically in section 2.2. The most significant information identified on the basis of the review of the literature was as follows:

- The origins of HRISs were discussed and can be briefly summarised as follows:
  - They were initially created in the 1960s to meet simple specific needs, such as storing information and making salary payments to staff.
  - Over subsequent decades, they evolved to range in size from single specialised systems to larger enterprise resource planning (ERP) systems such as SAP and Oracle.
- The definition proposed by Tannenbaum (1990) for HRISs was discussed as the system used to acquire, store, manipulate, analyse, retrieve and distribute pertinent information regarding an organisation's human resources. This definition, although older, remains relevant in its description of today's more powerful HRISs or human capital information systems (HCISs).
- The most common types of HRISs in use were identified as follows:
  - single HRIS-focused systems
  - modular HRISs
  - Cloud-based and ERP systems

One of the key elements identified in the literature review was the core factor in advocating the use of HRISs in the field of IOP and OD, as recommended by Schultz and Schultz (2014). They described the relationship between industrial psychology and systems as the interaction between human factors and technological design factors such as system complexity, ergonomic layout and interface responsiveness, both during the pre-implementation and post-implementation phases of ERP systems, are regarded as important focus areas of research and practice for industrial and organisational (I/O) psychologists.

The different types of HRISs that are most commonly found in the market were also discussed. The first type, namely the singular HRIS-focused system, was first created in the early 1960s and 1970s, where HRISs were simply designed programmes that could provide limited functions such as the

storage of basic information (Anitha & Aruna, 2013). The next type of system discussed was a modular system, which was described as a standalone program with several addable or removable modules that allow for data to be stored and used in multiple ways and across multiple aspects of a function such as HR (Kassim et al., 2012). The next type of system discussed was the cloud-based ERP system that provides its users with a total organisational solution and covers a range of functions including but not limited to HR, finance, procurement and reporting (Jenko & Roblek, 2016; Siengthai & Udomphol, 2016).

In summary, HRISs have a history that dates back several decades, and they come in several shapes and sizes with different functionality and capabilities. They are a critical tool for organisations to reduce the administration of their workforce, and with more sophisticated systems, can provide essential information for decision making. Based on the literature review conducted and the information gathered, this research aim was achieved.

#### *9.2.1.2 To conceptualise the uses of HRISs in organisations from a theoretical perspective.*

This aim was achieved in chapter 2, section 2.3, specifically 2.3.1, 2.3.2, 2.3.3 and 2.3.4. Several uses of HRISs for an organisation and an HRIS's relationship with organisational performance were identified in the literature and discussed in detail in these sections (Anitha & Aruna, 2013; Ankrah & Sokro, 2012; Ball, 2001; Jain, 2014; Jawahar & Harindran, 2013; Jones, 2016; Kassim et al., 2012; Siengthai & Udomphol, 2016). These can be summarised as follows:

- a reduction in administration and streamlining of work
- a repository for information and compliance
- reporting and analysis

The risk and damage of not making use of an HRIS the way it was intended were also discussed in detail in chapter 2, section 2.3, specifically 2.3.4 (Berger, 2014; Udekwe & De la Harpe, 2017). Berger (2014) identified an HRIS as a linchpin for most organisations because of its ability to link several different functions such as finance, IT, human capital and so forth. It was postulated that if a system is not utilised the way it was intended, then collaborative benefits cannot be realised.

The size of an organisation was also identified as a significant contributory factor to how an HRIS is used, what aspects of the system are purchased and implemented, and the value the system can add to the organisation (Ankrah & Sokro, 2012; Ball, 2001; Udekwe & De la Harpe, 2017). The literature indicated that the larger an organisation is, the more likely it is to have an HRIS to assist in the management of employee information and its uses.

Based on the uses identified in the literature, as well as the cost of not utilising an HRIS in the way it was intended, this aim was therefore achieved.

*9.2.1.3 To conceptualise the constructs of HRIS, organisational culture, leadership, internal organisational processes, as well as other constructs extracted from additional models on organisational performance and determine their key components from a theoretical perspective*

To achieve this specific aim, each construct was discussed in a separate chapter, specifically 2, 3, 4 and 5. A definition of the construct was provided, existing information identified in the literature on the construct was discussed and the relationships each construct had with other constructs and organisational performance were explained. A list of possible measures of the construct was then proposed. The chapters had the following areas of focus:

- Chapter 2 focussed on HRIS.
- Chapter 3 dealt with several OSFs specifically job satisfaction, organisational commitment, organisational learning and knowledge management and internal business processes.
- Chapter 4 explored leadership.
- Chapter 5 focused on culture.

This specific aim of conceptualising the construct of HRIS was achieved as follows:

- The existing models available for HRISs, as identified in the literature, were discussed and assessed.
- A possible list of measures to determine the effective use of an HRIS was compiled on the basis of the literature review.

The aim was addressed in chapter 2, specifically sections 2.4 and 2.6, for the construct of HRIS. The various models of HRISs that were identified in the literature were discussed in detail to gain a better understanding of the different elements used to review and assess an HRIS within an organisation and their effectiveness. The models discussed included the following:

- the Technology Acceptance Model (TAM) described by Erasmus et al. (2015)
- the HRIS Adoption Model developed by Alam et al. (2016)
- the Unified Theory of Acceptance and Use of Technology (UTAUT) Model, which was developed using a combination of eight different models analysed on the basis of the work of Venkatesh et al. (2003), and reviewed in Jawahar and Harindran's (2013; 2016) studies
- The Conceptual Model of HRIS Adoption proposed by Anitha and Aruna (2013)

- The HRIS model developed by Kassim et al. (2012), which is a combination of several models
- The research model conceptualising the strategic role of HRIS created by Ankrah and Sokro (2012)

The UTAUT Model was identified by the researcher as being the most valid because of several strengths, but a number of weaknesses were also identified and discussed in detail in section 2.4.7, chapter 2.

Based on the models reviewed and the benefits and functionality of an HRIS discussed in section 2.3, chapter 2, the key components of an HRIS were then identified. This resulted in a list of possible measures of the effective use of an HRIS being specified in section 2.6, table 2.1.

For the construct of internal business processes or mature business processes (MBPs), as it was renamed in the final model, this aim was achieved in chapter 3, section 3.3.3. MBP was a construct identified as having a relationship with organisational performance and was defined for this study according to Sidikat and Ayanda's (2008) definition, which opined that a business process is simply a set of activities that transforms a set of inputs into a set of outputs for another person using people and equipment. Once the construct had been defined, the relationship between it and other constructs such as organisational learning and knowledge management was reviewed and explained in detail. The existing models and tools for measuring MBP were reviewed and discussed, as identified in the literature. A list of possible measures for MBP was then proposed in section 3.3.3.4, chapter 3, based on the literature review conducted.

For the construct of job satisfaction (JS), this aim was achieved in chapter 3, section 3.3.1, and was the first construct discussed in the chapter along with organisational commitment (OC). For this study, it was defined as a pleasurable or positive emotional state resulting from the appraisal of one's job and job experiences and as a function of the perceived relationship between what one wants from one's job and what one perceives it offers (Buitendach & De Witte, 2005; Locke, 1976). The relationship between JS and organisational performance was discussed, as well as existing methods of reviewing the construct. The review of the literature resulted in a list of possible measures of JS that were added to the conceptual model. OC was the next construct discussed, and the aim was achieved in chapter 3, section 3.3.1. In this study, it was defined as "the relationship that exists between an individual and an organisation, attachment, identification with the organisation, the need to remain and the will to work hard to meet the organisational goals" (Ndlovu et al., 2018, p. 2). The relationship between OC and organisational performance was reviewed and discussed, and a list of possible measures of the construct was then compiled on the basis of the literature review.

Organisational learning was the next construct discussed and the aim achieved in chapter 3, section 3.3.2. Senge (1990) defined it as organisations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together. The construct of knowledge management was discussed next, and the aim achieved in chapter 3, section 3.3.2. In this study, it was defined, according to Schultze and Leidner's (2002, p. 218) definition, as "the generation, representation, storage, transfer, transformation application, embedding, and protecting of organisational knowledge". These constructs were identified on the basis of the literature review as having a vital relationship with organisational performance, and were explained in detail. The relationship between the constructs and innovation was also reviewed and explored as a means of understanding their impact on an organisation and the critical requirement to innovate. The tools and measures of organisational learning and knowledge management were then discussed as they were identified in the literature. Based on the information reviewed, a list of possible measures of the constructs was then compiled.

For the construct of leadership, this aim was achieved in chapter 4. In the process of achieving the aim, several different types of leadership were identified in the literature as having an influence on organisational performance and were discussed in sections 4.3, 4.4, 4.5 and 4.6. The definition of leadership used for the study was that by Gandolfi and Stone (2016), who asserted that the combination of the following five components render a potent working definition of leadership: (1) There must be one or more leaders, (2) leadership must have followers, (3) it must be action oriented with a legitimate (4) course of action, and there must be (5) goals and objectives. The core influences of leadership as identified in the literature were discussed and included relationships (Vanebo et al., 2015; Lord, 1977) and decision making (Choi et al., 2017).

The major leadership types, as identified in the literature, were discussed, and included transformational, transactional, ethical and several other types, with authentic leadership being identified as another leadership type that has an important relationship with organisational performance. A list of possible measures of the different leadership types was the compiled in section 4.7, table 4.2.

For the construct of organisational culture, this aim was achieved in chapter 5. The chapter focused on a detailed discussion of organisational culture, providing several definitions with different models of organisational culture discussed and reviewed in section 5.3. The definition of organisational culture that was considered to be best suited to this the study was the one compiled by the researcher after reviewing the definitions identified in the literature. Organisational culture was defined as being a shared set of norms, understandings, values and behaviours that direct and guide

employees on what is acceptable behaviour, ways of thinking and communicating within the organisation. The different cultural models identified in the literature were reviewed and discussed including the models of Hofstede (1980), Schein (1990), Deal and Kennedy (1982), Martins (2014) and Cameron and Quinn (2006).

Some of the influences of organisational culture that were identified in the literature, such as job satisfaction and organisational commitment (El Din & El Ghetany, 2015), innovation (Belac, 2017), organisational performance (Arikan & Enginoglu, 2016) and reward preferences (Bussin et al., 2016), were explained to gain a better understanding of the relationships between these different elements. A list of possible measures of organisational culture was then compiled in section 5.4, table 5.1, based on the literature review conducted.

#### *9.2.1.4 To develop a theoretical model of measures based on organisational success factors derived from an HRIS*

This aim was achieved in chapter 5. The aim was primarily achieved by consolidating the list of possible measures identified for each construct in their specific chapters into a single conceptual model, as depicted in figure 5.3 and table 5.2. The list of possible measures for the conceptual model was based on the researcher's experience of having worked with and implemented HRISs and related systems for the last 12 years in terms of what had been experienced as the most likely measures to be able to be drawn from an HRIS directly. The intention in developing the model on the basis of the literature review was that certain constructs (JS, OC, OL, etc.) and their measures would ultimately be used to provide an indication of the presence of other constructs, owing to the relationships established in the literature. This was the model that was then taken into the second phase of the research to be reviewed and refined.

## 9.2.2 Empirical research aims and conclusions

For this study, specific empirical aims were formulated, as specified in section 1.4.3. The ways in which these aims were achieved is explained in this section. As per the discussion of the quantitative results in chapter 8, and the summary of the hypotheses in section 8.10, table 8.53, all the anticipated hypotheses derived from the empirical aims of the research were accepted, with only one being rejected, as anticipated.



*9.2.2.1 To develop a valid and reliable questionnaire to measure the need for the use of HRIS data and organisational success factors*

Because there was no existing questionnaire the researcher could use to determine the need for the use of HRIS data, a new questionnaire was compiled. This aim was achieved in chapter 6, sections 6.7.4, 6.7.5 and 6.7.6, and chapter 8, sections 8.3.1 and 8.3.2. The primary analysis conducted to review the questionnaire designed in relation to the model, and determine validity and reliability was the outputs from the PLS-SEM conducted by reviewing the internal loadings of the indicators on their assigned construct, reviewing the internal consistency of the model, evaluating the convergent validity, and lastly, evaluating the discriminant validity (Hair et al., 2017; Hair et al., 2019). This was supported by the reliability analysis that was performed. One item specifically was used in the questionnaire to obtain feedback from the participants on their views on the need to use HRIS data, namely item 19. The level of agreement achieved for this item was 84% and a mean of 4.24, as indicated in tables 8.11 and 8.14.

The questionnaire that was designed, as per research aim 9.2.2.1, was determined to be valid and reliable, and focused specifically on the constructs identified during the first two phases of the research and their possible measures. All of these were then included as items to gather input from the participants. The detail of the instrument was discussed in section 6.7.4. Hypothesis H01 “A statistically significant questionnaire to measure the need for the use of HRIS data and measure the measures of organisational success factors and the factors themselves can be developed”, was accepted.

*9.2.2.2 To measure the constructs of HRIS, organisational culture, leadership, internal organisational processes and other constructs extracted from models on organisational performance and determine their key components*

The constructs of HRIS, organisational culture, leadership, internal organisational processes, and others identified from models on organisational performance and the literature were measured using the survey developed. This survey was sent out to a sample of participants selectively chosen on the basis of the criteria described in section 6.7.3 in chapter 6, who were employed in a group comprising several different businesses. The survey included the proposed measures of the constructs, as identified in the literature, and an item on the construct itself and its correlation with organisational success. Reliability analysis was then conducted on the constructs with their proposed indicators.

From the 13 constructs initially proposed, only two had a Cronbach alpha value below 0.7, specifically JS and OC. One item was removed from the proposed JS construct to enhance the results. Despite this, all the constructs were retained because of the theoretical support from the literature, the results of the reliability analysis, the indicator loadings on their assigned construct, internal consistency reliability, and the convergent and discriminant validity. The results of the reliability analysis were provided in tables 8.6 and 8.7, the level of agreement results in the first table in Annexure A, the mean scores results in table 8.12, the indicator outer loading results in table 8.40, the internal consistency reliability, convergent and discriminant validity results in tables 8.41, 8.42, 8.43 and 8.44. A summary of the results is as follows:

- Eleven of the 13 proposed constructs subjected to reliability analysis had a Cronbach alpha value of above 0.7, as recommended by Pallant (2016). The remaining two constructs had a strong theoretical basis and statistical support from the PLS-SEM analysis, specifically the item cross-loadings, composite reliability, AVE values and HTMT results.
- Nine of the 11 constructs in the final model had composite reliability values above the benchmark of between 0.6 to 0.7 for exploratory research but below the threshold of 0.95 recommended (Hair et al., 2017; Hair et al., 2019; Risher & Hair Jr, 2017; Wong, 2013). Only two, employee engagement and change capability, were above the 0.95 threshold, but the reason for this was they were single item constructs.
- Convergent validity was established as 10 of the 11 constructs had AVE values above the 0.5 threshold recommended (Hair et al., 2017; Hair et al., 2019; Henseler et al., 2016; Wong, 2013). Only the construct of JS and OC had an AVE value below 0.5, but due to its composite reliability and rho\_A values it was determined to be statistically acceptable.
- Discriminant validity was established because all the constructs item cross-loadings showed that the indicators loaded the most on their assigned constructs. All the constructs' HTMT results were also significantly below the threshold of 1.0, as suggested by Henseler et al. (2016).

Aim 2 was therefore achieved, and hypothesis H02 "The constructs of HRIS, leadership, organisational culture, internal organisational processes and other constructs extracted from organisational performance models can be determined, and their key components can be measured" was accepted.

### *9.2.2.3 To determine and test the empirical relationship between the construct of HRIS and measures based on organisational success factors*

The empirical relationship between HRISs and measures based on organisational success factors was evaluated through the path relationships between the constructs discussed in the structural model assessment (section 8.8.2). PLS-SEM was used as the method to analyse the path relationships. The approach adopted to determine the empirical relationship between HRISs and measures based on organisational success factors was to identify constructs and their possible measures that it was believed could be evaluated using data drawn from an HRIS. The constructs identified as being most likely to be evaluated directly were HRIS, mature business process, organisational commitment and job satisfaction, and knowledge management and organisational learning. The path relationships between these constructs and other constructs within the model were all found to be significantly positive (as explained in section 8.8.2.2, and depicted in figure 8.2 and tables 8.46 and 8.47).

Once the path relationships had been evaluated as being significantly positive, the total effect output from the PLS-SEM method utilised was assessed to determine the total effect of the constructs and identify the driver constructs within the model (as set out in table 8.48). This led to the identification of HRIS, Mature business processes, and organisational commitment and job satisfaction as driver constructs in the model. This means that if the indicators for the driver constructs are identified in the data drawn from an HRIS, it provides an indication of the driver constructs, which then provide an indication of the presence of other constructs. The construct of HRIS specifically was identified as a central construct in the model that had statistically significantly positive relationships with several constructs. The results supported hypothesis H03: “The empirical relationship between the construct HRIS and measures based on organisational success factors can be determined and tested through statistical analysis”.

### *9.2.2.4 To assess whether biographical variables play a moderating role in the use of HRISs*

Since biographical variables, as explained in section 8.6, were never a significant focus of the research, only the age and education groups were statistically tested to determine if there was any moderation of HRISs in deriving metrics and the measurement of organisational success factors between these groups. The primary means to assess this was to review item 15.6 “Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation” from the survey, using several statistical methods to determine if there were any

statistically significant differences. Items from the survey for age and for education were identified for each group that were statistically different, as explained in sections 8.6.1.3 and 8.6.2.4, but none of those identified included item 15.6. The summarised results were as follows:

- For the biographical variable of age, only two of the items in the survey were found to be statistically significantly different. These were items 6.1 and 10.2.
  - Item 6.1 was rated differently by the age groups 25 to 34 and 45 to 64, with the 45 to 64 group having a more positive view of the item.
  - For item 10.2, the age groups 25 to 34 and 35 to 44 differed, with the 35 to 44 group having a more positive view of the item.
- For the biographical variable of education three items in the survey were found to be statistically significantly different. These were items 17.4, 15.3 and 19.
  - For item 17.4, the below matric | matric | A or O levels group and the postgraduate group differed, with the former having a more positive view of the item.
  - For item 15.3, the below matric | matric | A or O levels group and the postgraduate group differed, with the latter having a more positive view of the item. The second group difference for this item was between the undergraduate and postgraduate groups, with the latter having a more positive view of the item.
  - For item 19, the below matric | matric | A or O levels group and the postgraduate group differed, with the latter having a more positive view of the item.

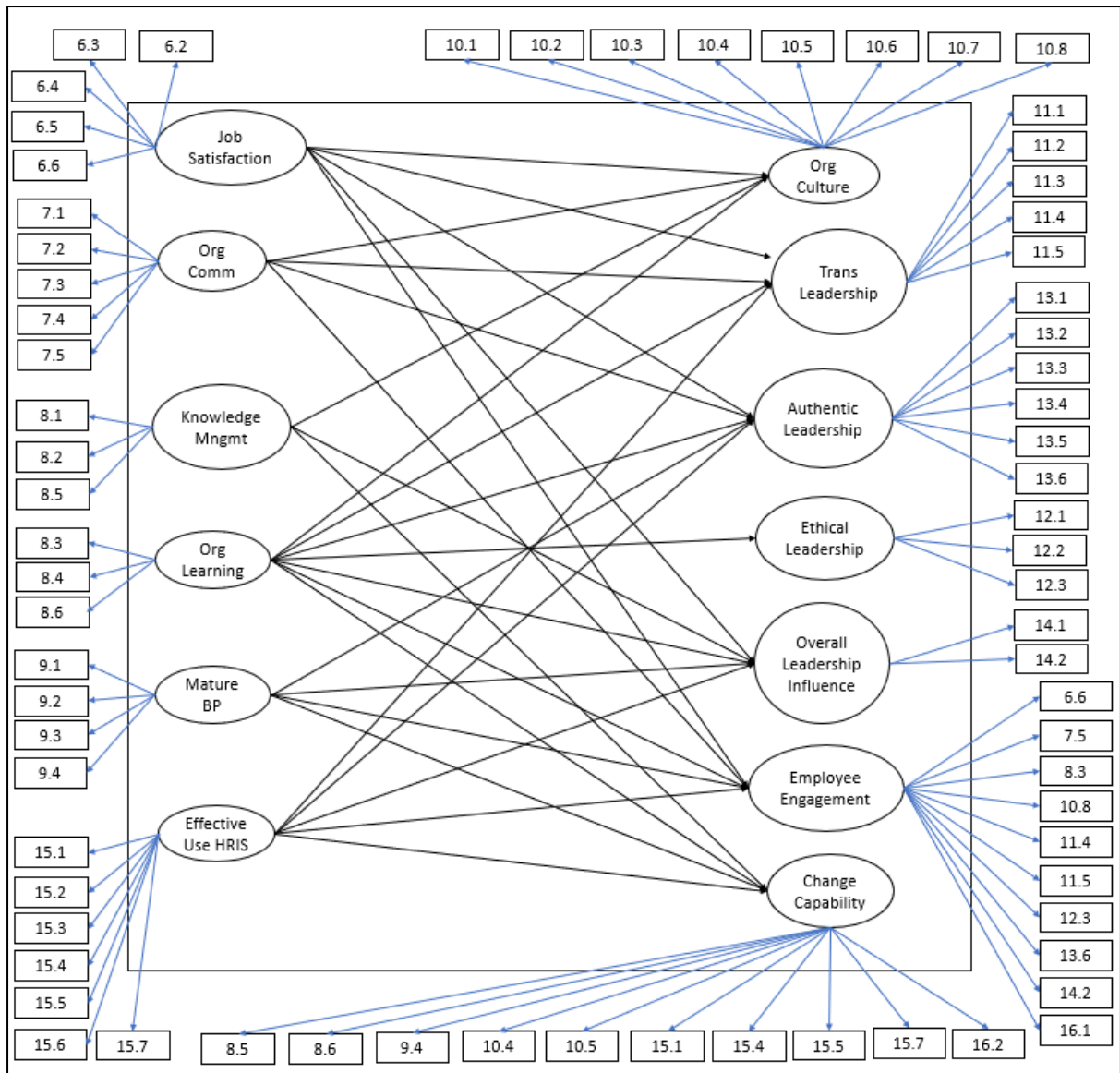
Overall, it could therefore be concluded, for the items identified, that where the educational level of participants increased, the more positively they reviewed the items that were identified as having significant different means. As item 15.6, which dealt with using an HRIS to provide an indication of the presence of organisational success factors, was not an item identified, where there were differences between the groups, the aim was therefore achieved, hypothesis H04 “There will be a significant difference between the biographical variables in moderating the use of HRIS to derive metrics and the measurement of organisational success factors”, was rejected. Hypothesis Ha4 “There will be no significant difference between the biographical variables in moderating the use of an HRIS to derive metrics and the measurement of organisational success factors” was accepted.

*9.2.2.5 To develop and test an empirical model for HRISs and measures by means of structural equation modelling*

Aim 5 was achieved in chapter 8, specifically section 8.8. The PLS-SEM analysis conducted assessed an HRIS in providing an indication of the presence of organisational success factors. The model evaluated and statistically tested was reflective and several outputs from the statistical analysis were used to assess and evaluate it, including composite reliability, discriminant validity, the coefficient of determination, F squared values, Q squared values for predictive relevance, and the standardised root mean residual (SRMR) for overall model fit. The initial conceptual model proposed by the researcher was depicted in figure 5.3 and table 5.2 in chapter 5, with the model refined on the basis of the use of the data collected from phase 2 of the research and the correlation analysis results from phase 3 of the research being provided in figure 9.1. All the proposed indicators and constructs were measured according to the refined empirical model. The final detailed empirical model created and refined using SmartPLS 3.3.3 with relationships and other output results from the PLS-SEM analysis is represented in figures 9.2 and 9.3. These figures show the detail of relationships between the driver exogenous constructs and the endogenous constructs, as well as the R and F squared values for the constructs.

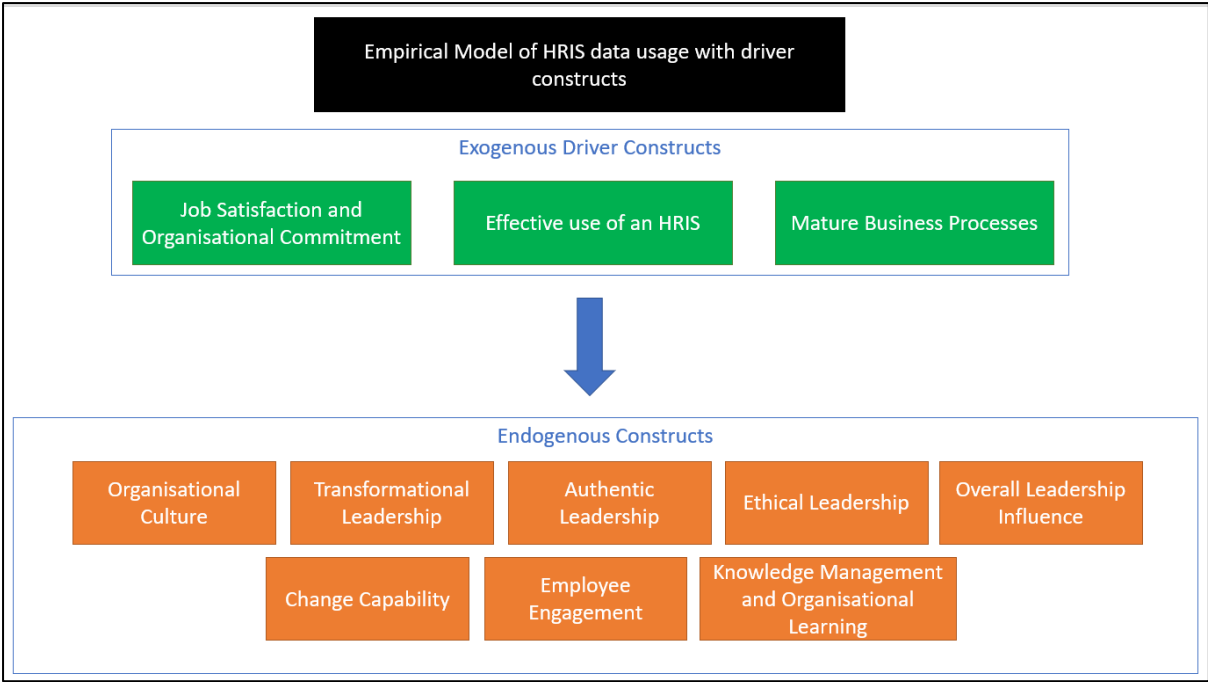
**Figure 9.1**

*Refined Empirical Model*



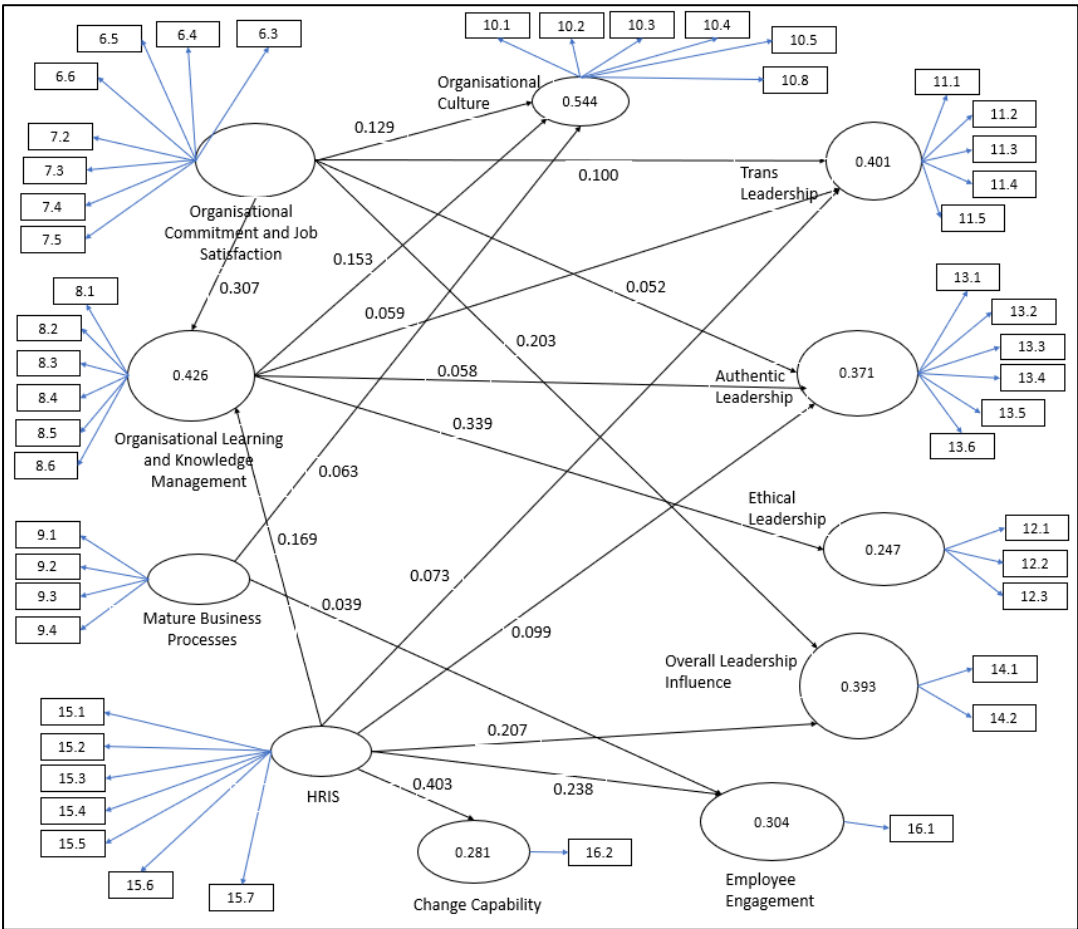
**Figure 9.2**

*Final High-level Empirical Model*



**Figure 9.3**

*Final Detailed Empirical Model with the Path Relationships, R Squared and F Squared Values*



The empirical model depicted in figure 9.1 was refined using PLS-SEM until a final reflective model was created (as shown in figures 8.1, 8.2 and 9.3). The predictive effect sizes for the relationships between the constructs from the final model were described as small to large, based on the output from the PLS-SEM (as shown in table 8.50). The smallest effect size was between mature business processes and employee engagement, with the largest effect size being between HRIS and change capability. Owing to the nature of the study and of the model that was its main aim, any effect size was deemed significant because of the intention to design a model that would allow for an indication of organisational success factors to be provided using data drawn from an HRIS. Any effect between the constructs in the model was therefore relevant as the list of constructs and their possible measures was never indicated as exhaustive, and what was proposed was anticipated to explain only some of the variance in the endogenous constructs. What was established is that many of the theoretical relationships identified in the literature review in chapters 2, 3, 4 and 5 were statistically significant such as that between organisational commitment and job satisfaction, and organisational culture. Hence some constructs where data could be drawn more easily could be used to provide an indication of the presence of other constructs to a certain extent.

All the path relationships were significantly positive, as mentioned in section 8.8.2.2 (as represented in tables 8.46, 8.47 and 8.48). Based on the results, HRIS was identified as the construct with the highest number of significant positive relationships with other constructs. This was relevant to the study because HRIS was the focus and was shown statistically to have a significant relationship with several constructs in the model that was developed. The high-level relationships identified on the basis of the PLS-SEM analysis between the driver exogenous constructs, including HRIS, and the endogenous constructs, are shown in figure 9.2, with the detailed relationships and the R and R squared values between the constructs depicted in figure 9.3.

The comparison between the model in figure 9.1 used for the initial PLS-SEM and the high-level model in figure 9.2, and the final detailed empirical model in figure 9.3, the significant differences between them, are explained below, but these were explained in more detail in section 8.9.

- The initial 13 constructs were refined, and some were combined based on issues from the PLS-SEM analysis. This included job satisfaction (JS) and organisational commitment (OC) being combined into Org Comm & JS, and organisational learning (OL) and knowledge management (KM) being combined into Org Lrn & KM.
- Several indicators for the constructs initially created were removed owing to issues relating to discriminant validity and the outer loadings. The result was that employee engagement (Emp Eng) and change capability (Change Cpb) became single item constructs based on the item initially included in the survey.



Based the results of the PLS-SEM analysis, the model identified achieved the following aim: “To develop an empirical model for HRISs and measures by means of structural equation modelling on organisational success factors”. Hypothesis H05 “An empirical model for HRISs and measures can be created and tested using structural equation modelling on organisational success factors” was also accepted. The model that was created was deemed unique in that it provides a possible list of organisational success factors and their possible indicators in a one place, along with a means to draw data from an HRIS which could be used to provide an indication of constructs based on specific driver constructs. HRISs appear to be a gap in the field of industrial and organisational psychology – hence this study possible contribution to closing the gap.

The final model depicted in figures 9.2 and 9.3 provides IOP and OD practitioners with a means to utilise data drawn from an HRIS to establish an indication of constructs within an organisation. The indication of the constructs can then be used to create more targeted interventions to help the organisation enhance its performance.

#### *9.2.2.6 To make recommendations for the discipline of industrial and organisational psychology and human resource management on HRISs and measures based on organisational success factors for future research*

Aim 6 of the study was achieved by creating a model as depicted in figures 8.1, 8.2, 9.2 and 9.3, with the detail discussed in sections 8.9 and 9.2.2.5. The following recommendations were therefore made for industrial and organisational psychologists and human resource management practitioners:

- The list of constructs that influence organisational performance and their measures could be used to assess the presence of these constructs within an organisation.
- A model, containing the constructs and their measures, identified driver constructs and their measures, could be used as a blueprint in designing more targeted organisational development interventions based on HRIS data that can be extracted.

#### 9.2.3 General research question

Based on the detail provided in achieving the aims of the literature review and empirical study in sections 9.2.1 and 9.2.2, the following general research question was answered: “To what extent

could a scientific model of organisational metrics based on organisational success factors derived from human resource information systems be used in organisational development initiatives be developed?”. The answer was affirmative to a significant extent as a model was created from a review of the literature, refined during the qualitative phase of the research and statistically tested and further refined during the quantitative phase of the research. The result was a statistically tested model based on a strong theoretical foundation that could be used in organisational development initiatives.

#### 9.2.4 Conclusions relating to the contribution to the field of industrial and organisational psychology

The information identified in the literature review and the statistical analysis conducted should contribute to the field of industrial and organisational psychology (as explained in sections 9.2.2.5 and 9.2.2.6). The literature review provided possible organisational success factors and their possible measures. It explained in detail what each of the organisational success factors was, their main influences and correlations with organisational performance and a list of possible measures, as had been identified in several studies conducted. Based on the literature review, a conceptual model of organisational success factors and their measures was created with correlations to HRISs.

This study is deemed to be unique in the field and should contribute to the body of knowledge on HRISs and their uses for assisting organisations to enhance their performance. As key role players in improving the performance of individuals, teams and organisations, industrial psychologists in the modern world need to understand and use HRISs, which many organisations rely on to assist them with the interventions they design in a more targeted way and as a valuable source of data. The findings of this study provide a framework that could be used in utilising data drawn from an HRIS for driver constructs identified, which, to an extent, could indicate the presence of other constructs.

In conclusion, industrial psychologists should find the model created and the literature review conducted useful in designing interventions to help organisations enhance their performance using an organisation’s HRIS. By determining to an extent, the presence of organisational success factors within an organisation, industrial psychologists would be better informed and made aware of where the specific issues regarding organisational success factors are that require targeted interventions to enhance them.

### 9.3 Limitations

The limitations of the research conducted for the literature review and empirical study are highlighted below.

#### 9.3.1 Limitations of the literature review

The following limitations were identified in the literature review:

- As mentioned in the problem statement for the research, there appears to be little understanding of the functionality, uses for and structures of HRISs among IOPs in South Africa. This therefore posed a limitation in that there was no one apparent to the researcher from an academic perspective whom the researcher could engage with on the topic. The researcher was unable to find any empirical studies on this topic specifically.
- When conducting the literature review, there appeared to be a paucity of information and literature on the topic, both internationally and from a South African perspective. Hence there was no previous foundation upon which the research could be built and refined. This resulted in a significant amount of time being spent searching, reviewing and extracting data from a variety of studies, which in some instances, had a significantly different focus than that of this research.

#### 9.3.2 Limitations of the empirical study

The limitations identified in the empirical study are discussed below.

- Selective sampling was used for the study with specific criteria that the participants needed to meet to participate that aimed at enhancing the quality of the input received. However, this meant that although the organisation in which the study was conducted has several thousand employees spread over a large geographic area, only about 200 were eligible for participation. This significantly limited the sample that the researcher hoped to collect for the study.
- The study was limited to only one group of companies. Although the group selected has different business entities across different geographic regions, and with many employees, it would be beneficial to have included other organisations in the study because this could have provided even greater insights.

- The evaluation and assessment of the model proposed were based on the perception of the participants involved and not on data drawn from an HRIS directly. It would have been preferable to combine the data from SMEs and data from the organisation's HRIS to assess the model.
- Benchmark values for the proposed indicators of the constructs were not proposed in this study, and this might add even more value to future research.
- The context of the organisation used for the research could cause the metrics identified in the HRIS to vary, affecting the generalisability of the study.
- The model consisted of organisational success factors and their measures identified by the researcher from the literature and there are therefore further factors and measures that could be added to the model, such as training data and data related to employee talent and competence.

## 9.4 Recommendations

Having achieved the empirical aim of the study, this section makes recommendations for possible future research based on the results and findings of this study.

### 9.4.1 Recommendations for future research

The main target audience for the recommendations are IOPs and OD practitioners. These recommendations for the field of industrial and organisational psychology are based on the conclusions and limitations of the research conducted.

As discussed in section 9.3.2, a limitation of the study was that it was only conducted within one group of companies. Hence the findings cannot be generalised to all companies in South Africa, and relate only to the population in the study. Future research could focus on sampling from as many organisations as possible.

The target population of the study was also limited to only those participants who met the criteria it was believed would allow them to provide good quality input and feedback. Additional research could focus on expanding the population to cover all those participants who might be able to make a contribution.

Another limitation discussed in 9.2.3 was that the evaluation of the model designed was only done on the basis of the participants' feedback and not from data drawn directly from an HRIS. Thus a

recommendation for future research would be to take the model developed and test it with actual data extracted from an HRIS against benchmark values for absenteeism, pay and so forth, to further test the model created.

In conclusion, the model created on the use of HRISs to provide an indication of organisational success factors in an organisation appears to be an original contribution to the field of IOP in South Africa and could therefore be used to inform and assist with future research in this area.

#### 9.4.2 Recommendations for IOPs and OD practitioners

Based on the detail discussed in section 9.2, the following overall recommendations were therefore made for IOPs and ODs:

- The list of constructs that influence organisational performance and their measures could be used to assess the presence of these constructs within an organisation.
- A model, containing the constructs and their measures, identified driver constructs and their measures, could be used as a blueprint in designing more targeted organisational development interventions based on HRIS data that can be extracted.

Owing to the lack of available research on the topic identified, when conducting the literature review, the information gathered on constructs and their possible measures was regarded as a valuable source of information for IOPs and OD practitioners. The model that was designed was also supported by several of the statistical methods used to evaluate it, including the R squared values for the constructs in providing in-sample predictive power and the Q squared values that provided the out-of-sample predictive power. The SRMR value, while not being below 0.08, was within the parameters recommended by Hu and Bentler (1999) and Wong (2013), and therefore confirmed the validity of the model as a framework for IOPs and OD practitioners. Identifying the driver constructs of human resource information systems, organisational commitment and job satisfaction, and mature business processes was also a significant result for the model and was believed to be particularly relevant in terms of its use and for future research. The thinking supported by the statistical analysis was that specific constructs could be identified that could be evaluated using data drawn directly from an HRIS, and these constructs would then provide an indication of the presence of other constructs.

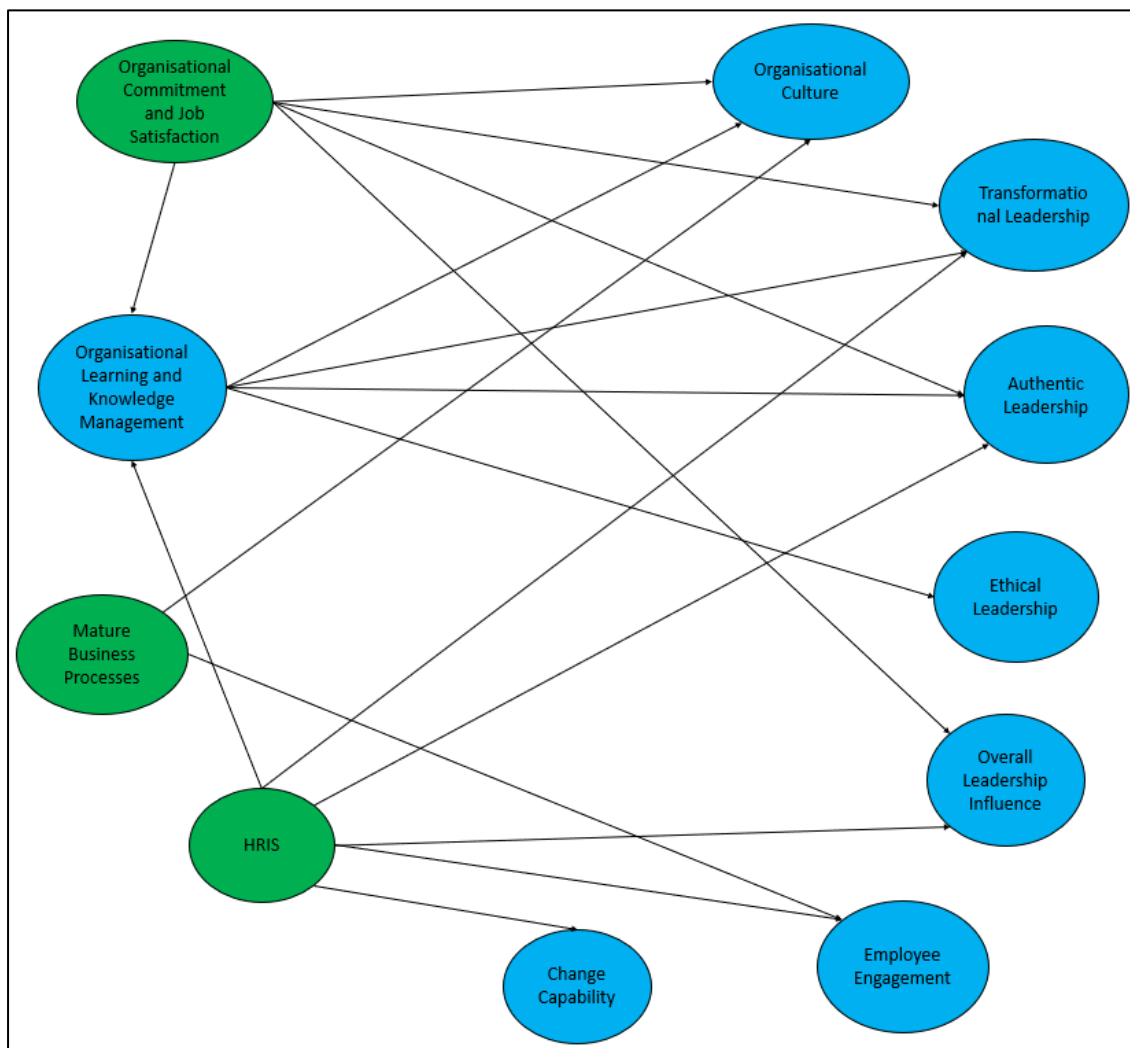
The initial aim of the research was to address a gap deemed to exist in the field of IOP regarding the understanding of HRISs and related systems and how they could be used to provide valuable data to

practitioners trying to assist organisations. The model developed and tested in this study was believed to be a significant attempt to address this gap and assist practitioners to use HRISs and related systems.

It is therefore recommended that the model developed, and the relationships identified between the driver constructs in green and the remaining constructs in light blue, depicted in figure 9.4, be used by practitioners in the initiatives they design to assist organisations. This could be done by providing a means for evaluating constructs, to an extent, within the organisation using data drawn from an HRIS and understanding the impact that the driver constructs have on the other constructs in the model. The model could then be used to design more specific and targeted interventions using the driver constructs, and result in better enhancements and improvements in an organisation.

**Figure 9.4**

*Model Detailing the Relationships between the Driver Constructs of HRIS, Organisational Commitment and Job Satisfaction and Mature Business Processes with the other Constructs*



## 9.5 Evaluations of the research: Theoretical, practical and empirical

The study focused on the creation of a model for the use of an HRIS to provide an indication of the presence of organisational success factors in an organisation. The understanding and use of HRISs has become an imperative for modern-day practitioners because of the reliance of so many organisations on these systems.

The literature review identified several constructs and a list of their possible measures. It also assisted in providing a correlation between the constructs. For organisations there is much more to succeeding or failing in the world of work today than simply the financial metrics they can track. Nonfinancial metrics are equally important in determining the success or failure of organisations. Understanding and improving these nonfinancial measures in an organisation is essential to ensure a healthy, engaged and productive workforce. The use of an HRIS to store, analyse and report on information has also become more common as organisations seek to enjoy the benefits these systems offer and leverage them to make more informed business decisions.

For IOPs and OD practitioners trying to assist organisations to enhance their performance, it is essential that they understand the constructs, their possible measures and how HRISs could be used to assess them. In the experience of the researcher, few practitioners in the fields of IOP and OD understand HRIS and what organisations use them for. Gaining a better understanding of HRISs and their correlation with constructs should lead to better use of the significant amount of information stored in these systems to provide insights and inform decision making. Of significance in this study, was the creation of a model that provides practitioners with a method to draw data drawn from an HRIS that can be used to indicate the presence of certain constructs, and that this, in turn, can be used to explain the presence of other constructs to an extent that is not as easily measured with data drawn from an HRIS.

The empirical study focused on the development of the model envisioned for the use of an HRIS with the relationships between various constructs specified and statistically tested. The central hypothesis of this thesis was supported, namely that a model of HRIS, and measures of constructs, could be developed. The empirical study also accepted the hypotheses on the creation of constructs and their possible measures, the use of HRIS data to indicate the presence of constructs within an organisation, and the confirmation of envisioned driver constructs (HRIS, MBP and Org Comm and JS) that could more easily be assessed with data from an HRIS and then, in turn, could provide some indication of the presence of other constructs.

In conclusion, the researcher's opines that the constructs developed with possible measures provide a means for reviewing constructs within an organisation in a central location. Moreover, the model should provide practitioners with a blueprint on how to utilise HRISs and the data they house more effectively in informing and designing interventions to enhance organisational performance. Future research recommendations were made, and the study should make a positive contribution in the fields of HRIS, industrial and organisational psychology, human resources management, analytics and business intelligence.

## 9.6 Chapter summary

In this chapter, the conclusions drawn from the literature review and empirical research aims were discussed. Possible limitations of the literature review and empirical review were identified and explained. Recommendations for future research and for IOP and OD practitioners were formulated focusing primarily on using data drawn from an organisation's actual HRIS to assess the model, establishing benchmarks for the indicators of the constructs and making use of a larger population and sample. In conclusion, the research was evaluated with the focus on the framework the model provides on HRIS, with possible constructs and indicators that could be used.



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## Annexure A. Statistical Results

### Item Frequency Results with Agreement %

Items		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Total	% Agreement
6.1) Low voluntary turnover is an indicator of higher job satisfaction	n	3	22	18	54	21	118	
	%	2.5%	18.6%	15.3%	45.8%	17.8%	100.0%	63.6%
6.2) Low absenteeism is an indicator of higher job satisfaction	n	7	12	15	61	23	118	
	%	5.9%	10.2%	12.7%	51.7%	19.5%	100.0%	71.2%
6.3) Organisational commitment is an indicator of higher job satisfaction	n	0	6	15	64	33	118	
	%	0.0%	5.1%	12.7%	54.2%	28.0%	100.0%	82.2%
6.4) The content of a job enhances employees' job satisfaction	n	0	2	8	65	43	118	
	%	0.0%	1.7%	6.8%	55.1%	36.4%	100.0%	91.5%
6.5) Higher pay is an indicator of higher job satisfaction	n	0	33	28	38	19	118	
	%	0.0%	28.0%	23.7%	32.2%	16.1%	100.0%	48.3%
6.6) Job satisfaction is an indicator of organisational success	n	0	9	10	49	50	118	
	%	0.0%	7.6%	8.5%	41.5%	42.4%	100.0%	83.9%
7.1) Low voluntary turnover is an indicator of higher organisational commitment	n	3	18	23	54	20	118	
	%	2.5%	15.3%	19.5%	45.8%	16.9%	100.0%	62.7%
7.2) Low absenteeism is an indicator	n	3	10	24	62	19	118	
	%	2.5%	8.5%	20.3%	52.5%	16.1%	100.0%	68.6%



higher of organisational commitment								
7.3) Job satisfaction is an indicator of higher organisational commitment	n	0	2	18	70	28	118	
	%	0.0%	1.7%	15.3%	59.3%	23.7%	100.0%	83.1%
7.4) The implementation of total rewards elements enhances organisational commitment amongst employees	n	1	6	7	62	42	118	
	%	0.8%	5.1%	5.9%	52.5%	35.6%	100.0%	88.1%
7.5) Organisational commitment is an indicator of organisational success	n	0	4	6	64	44	118	
	%	0.0%	3.4%	5.1%	54.2%	37.3%	100.0%	91.5%
8.1) Technology used to support knowledge management is an indicator of effective knowledge management	n	0	3	16	71	28	118	
	%	0.0%	2.5%	13.6%	60.2%	23.7%	100.0%	83.9%
8.2) Elements of a good knowledge management system are an indicator of effective knowledge management	n	0	1	16	75	26	118	
	%	0.0%	0.8%	13.6%	63.6%	22.0%	100.0%	85.6%
8.3) Continuous professional development (CPD) activities within an organisation are an indicator of effective	n	0	2	8	68	40	118	
	%	0.0%	1.7%	6.8%	57.6%	33.9%	100.0%	91.5%

learning management								
8.4) Job satisfaction is an indicator of effective organisational learning	n	0	7	19	63	29	118	
	%	0.0%	5.9%	16.1%	53.4%	24.6%	100.0%	78.0%
8.5) Knowledge management is an indicator of organisational success	n	0	8	19	59	32	118	
	%	0.0%	6.8%	16.1%	50.0%	27.1%	100.0%	77.1%
8.6) Organisational learning is an indicator of organisational success	n	0	1	11	67	39	118	
	%	0.0%	0.8%	9.3%	56.8%	33.1%	100.0%	89.8%
9.1) The defined level described by the Capability Maturity Model (CMM) is an indicator of mature business processes within an organisation	n	0	7	20	75	16	118	
	%	0.0%	5.9%	16.9%	63.6%	13.6%	100.0%	77.1%
9.2) Processes that have been mapped out are an indicator of business processes being mature within an organisation	n	1	10	23	66	18	118	
	%	0.8%	8.5%	19.5%	55.9%	15.3%	100.0%	71.2%
9.3) An organisation that has structured itself to focus on process improvement is an indicator of business processes being mature within an organisation	n	0	7	10	63	38	118	
	%	0.0%	5.9%	8.5%	53.4%	32.2%	100.0%	85.6%

9.4) Mature business processes are an indicator of organisational success	n	0	8	13	53	44	118	
	%	0.0%	6.8%	11.0%	44.9%	37.3%	100.0%	82.2%
10.1) Job satisfaction is an indicator of a good organisational culture	n	1	6	8	76	27	118	
	%	0.8%	5.1%	6.8%	64.4%	22.9%	100.0%	87.3%
10.2) Organisational commitment is an indicator of a good organisational culture	n	0	5	7	72	34	118	
	%	0.0%	4.2%	5.9%	61.0%	28.8%	100.0%	89.8%
10.3) Innovation is an indicator of a good organisational culture	n	0	5	10	57	46	118	
	%	0.0%	4.2%	8.5%	48.3%	39.0%	100.0%	87.3%
10.4) The effective utilisation of technological subsystems to turn inputs into outputs is an indicator of a good organisational culture	n	0	8	18	62	30	118	
	%	0.0%	6.8%	15.3%	52.5%	25.4%	100.0%	78.0%
10.5) The extent to which different elements of the Total Reward Framework are implemented according to occupational group preferences is an indicator of a good organisational culture	n	0	9	27	58	24	118	
	%	0.0%	7.6%	22.9%	49.2%	20.3%	100.0%	69.5%
10.6) Effective leadership is	n	0	0	5	47	66	118	
	%	0.0%	0.0%	4.2%	39.8%	55.9%	100.0%	95.8%

an indicator of a good organisational culture								
10.7) The clan/group culture type as described by the Competing Values Framework is an indicator of a good organisational culture	n	0	6	29	56	27	118	
	%	0.0%	5.1%	24.6%	47.5%	22.9%	100.0%	70.3%
10.8) Organisational culture is an indicator of organisational success	n	0	7	11	56	44	118	
	%	0.0%	5.9%	9.3%	47.5%	37.3%	100.0%	84.7%
11.1) Job satisfaction is an indicator of transformational leadership	n	0	10	20	58	30	118	
	%	0.0%	8.5%	16.9%	49.2%	25.4%	100.0%	74.6%
11.2) Organisational commitment is an indicator of transformational leadership	n	0	5	16	63	34	118	
	%	0.0%	4.2%	13.6%	53.4%	28.8%	100.0%	82.2%
11.3) Organisational learning is an indicator of transformational leadership	n	0	2	13	69	34	118	
	%	0.0%	1.7%	11.0%	58.5%	28.8%	100.0%	87.3%
11.4) A clearly defined purpose is an indicator of transformational leadership	n	0	2	9	61	46	118	
	%	0.0%	1.7%	7.6%	51.7%	39.0%	100.0%	90.7%
11.5) Transformational leadership is an indicator of	n	0	3	12	51	52	118	
	%	0.0%	2.5%	10.2%	43.2%	44.1%	100.0%	87.3%

organisational success								
12.1) Organisational citizenship behaviour is an indicator of ethical leadership	n	0	2	24	67	25	118	
	%	0.0%	1.7%	20.3%	56.8%	21.2%	100.0%	78.0%
12.2) Corporate social responsibility is as an indicator of ethical leadership	n	1	3	20	59	35	118	
	%	0.8%	2.5%	16.9%	50.0%	29.7%	100.0%	79.7%
12.3) Ethical leadership is an indicator of organisational success	n	0	3	7	53	55	118	
	%	0.0%	2.5%	5.9%	44.9%	46.6%	100.0%	91.5%
13.1) Enhanced employee performance is an indicator of ethical leadership	n	0	4	15	67	32	118	
	%	0.0%	3.4%	12.7%	56.8%	27.1%	100.0%	83.9%
13.2) Work engagement is an indicator of ethical leadership	n	0	4	14	73	27	118	
	%	0.0%	3.4%	11.9%	61.9%	22.9%	100.0%	84.7%
13.3) Organisational commitment is an indicator of ethical leadership	n	0	4	18	71	25	118	
	%	0.0%	3.4%	15.3%	60.2%	21.2%	100.0%	81.4%
13.4) Reduced staff turnover is an indicator of ethical leadership	n	3	14	31	52	18	118	
	%	2.5%	11.9%	26.3%	44.1%	15.3%	100.0%	59.3%
13.5) Increased trust is an indicator of authentic leadership	n	0	0	12	56	50	118	
	%	0.0%	0.0%	10.2%	47.5%	42.4%	100.0%	89.8%
13.6) Authentic leadership is an indicator of	n	0	2	12	59	45	118	
	%	0.0%	1.7%	10.2%	50.0%	38.1%	100.0%	88.1%

organisational success								
14.1) A good organisational culture is an indicator of an effective overall leadership influence	n	0	0	8	53	57	118	
	%	0.0%	0.0%	6.8%	44.9%	48.3%	100.0%	93.2%
14.2) Overall leadership influence is an indicator of organisational success	n	0	1	9	54	54	118	
	%	0.0%	0.8%	7.6%	45.8%	45.8%	100.0%	91.5%
15.1) The presence of an HRIS is an indicator that an organisation is on the path to better management of its human resources information	n	0	4	9	62	43	118	
	%	0.0%	3.4%	7.6%	52.5%	36.4%	100.0%	89.0%
15.2) Usage of an HRIS by its users is an indicator of the effectiveness of the HRIS	n	1	6	14	59	38	118	
	%	0.8%	5.1%	11.9%	50.0%	32.2%	100.0%	82.2%
15.3) Reduction in administration levels is an indicator of the effective use of an HRIS	n	0	4	12	64	38	118	
	%	0.0%	3.4%	10.2%	54.2%	32.2%	100.0%	86.4%
15.4) Storing of information on an HRIS promotes access to information across the organisation	n	0	1	10	60	47	118	
	%	0.0%	0.8%	8.5%	50.8%	39.8%	100.0%	90.7%
15.5) Analytics conducted using an HRIS is an indicator of the	n	0	2	15	53	48	118	
	%	0.0%	1.7%	12.7%	44.9%	40.7%	100.0%	85.6%

effective use of the HRIS								
15.6) Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation	n	0	4	17	62	35	118	
	%	0.0%	3.4%	14.4%	52.5%	29.7%	100.0%	82.2%
15.7) The effective use of HRIS is an indicator of organisational success	n	0	4	16	57	41	118	
	%	0.0%	3.4%	13.6%	48.3%	34.7%	100.0%	83.1%
16.1) Employee engagement is an indicator of organisational success	n	0	3	4	58	53	118	
	%	0.0%	2.5%	3.4%	49.2%	44.9%	100.0%	94.1%
16.2) Change capability is an indicator of organisational success	n	0	2	8	60	48	118	
	%	0.0%	1.7%	6.8%	50.8%	40.7%	100.0%	91.5%
17.1) Employees who have been with the organisation for a shorter period tend to show higher levels of job satisfaction than employees who have been with the organisation for a longer period	n	6	34	28	33	17	118	
	%	5.1%	28.8%	23.7%	28.0%	14.4%	100.0%	42.4%
17.2) Older employees tend to be generally more satisfied with their jobs than younger employees	n	2	26	38	34	18	118	
	%	1.7%	22.0%	32.2%	28.8%	15.3%	100.0%	44.1%

17.3) Females generally have higher levels of job satisfaction than males	n	12	30	53	13	10	118	
	%	10.2%	25.4%	44.9%	11.0%	8.5%	100.0%	19.5%
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	n	4	16	16	59	23	118	
	%	3.4%	13.6%	13.6%	50.0%	19.5%	100.0%	69.5%
17.5) Females generally have higher levels of organisational commitment than males	n	6	23	48	27	14	118	
	%	5.1%	19.5%	40.7%	22.9%	11.9%	100.0%	34.7%

*One-sample Effect Sizes Results HRIS Conceptual Model Analysis*

Items		Standardiser <sup>a</sup>	Point estimate	95% confidence interval	
				Lower	Upper
6.1) Low voluntary turnover is an indicator of higher job satisfaction	Cohen's d	1.065	0.541	0.347	0.733
	Hedges' correction	1.072	0.537	0.344	0.728
6.2) Low absenteeism is an indicator of higher job satisfaction	Cohen's d	1.084	0.633	0.434	0.830
	Hedges' correction	1.091	0.629	0.432	0.825
6.3) Organisational commitment is an indicator of higher job satisfaction	Cohen's d	0.783	1.342	1.092	1.590
	Hedges' correction	0.788	1.334	1.085	1.580
6.4) The content of a job enhances employees' job satisfaction	Cohen's d	0.659	1.915	1.609	2.218
	Hedges' correction	0.664	1.903	1.599	2.204
6.5) Higher pay is an indicator of higher job satisfaction	Cohen's d	1.059	0.344	0.158	0.529
	Hedges' correction	1.066	0.342	0.157	0.526
6.6) Job satisfaction is an indicator of organisational success	Cohen's d	0.886	1.339	1.088	1.586
	Hedges' correction	0.892	1.330	1.081	1.576
	Cohen's d	1.023	0.580	0.384	0.774



7.1) Low voluntary turnover is an indicator of higher organisational commitment	Hedges' correction	1.030	0.576	0.381	0.769
7.2) Low absenteeism is an indicator higher of organisational commitment	Cohen's d	0.925	0.769	0.562	0.973
	Hedges' correction	0.931	0.764	0.559	0.967
7.3) Job satisfaction is an indicator of higher organisational commitment	Cohen's d	0.677	1.551	1.281	1.818
	Hedges' correction	0.682	1.541	1.273	1.806
7.4) The implementation of total rewards elements enhances organisational commitment amongst employees	Cohen's d	0.820	1.427	1.168	1.682
	Hedges' correction	0.825	1.418	1.161	1.671
7.5) Organisational commitment is an indicator of organisational success	Cohen's d	0.706	1.776	1.484	2.064
	Hedges' correction	0.711	1.764	1.474	2.051
8.1) Technology used to support knowledge management is an indicator of effective knowledge management	Cohen's d	0.690	1.523	1.256	1.787
	Hedges' correction	0.694	1.513	1.248	1.776
8.2) Elements of a good knowledge management system are an indicator of effective knowledge management	Cohen's d	0.623	1.713	1.428	1.995
	Hedges' correction	0.627	1.702	1.418	1.983
8.3) Continuous professional development (CPD) activities within an organisation are an indicator of effective learning management	Cohen's d	0.649	1.905	1.600	2.207
	Hedges' correction	0.654	1.893	1.590	2.193
	Cohen's d	0.805	1.200	0.961	1.435

8.4) Job satisfaction is an indicator of effective organisational learning	Hedges' correction	0.810	1.192	0.955	1.426
8.5) Knowledge management is an indicator of organisational success	Cohen's d	0.842	1.158	0.923	1.390
	Hedges' correction	0.847	1.150	0.917	1.381
8.6) Organisational learning is an indicator of organisational success	Cohen's d	0.642	1.900	1.596	2.201
	Hedges' correction	0.646	1.888	1.585	2.187
9.1) The defined level described by the Capability Maturity Model (CMM) is an indicator of mature business processes within an organisation	Cohen's d	0.724	1.171	0.935	1.404
	Hedges' correction	0.728	1.164	0.929	1.395
9.2) Processes that have been mapped out are an indicator of business processes being mature within an organisation	Cohen's d	0.844	0.904	0.688	1.117
	Hedges' correction	0.850	0.898	0.683	1.109
9.3) An organisation that has structured itself to focus on process improvement is an indicator of business processes being mature within an organisation	Cohen's d	0.797	1.403	1.147	1.656
	Hedges' correction	0.802	1.394	1.140	1.646
9.4) Mature business processes are indicator of organisational success	Cohen's d	0.863	1.306	1.059	1.551
	Hedges' correction	0.868	1.298	1.052	1.541
10.1) Job satisfaction is an indicator of a good organisational culture	Cohen's d	0.762	1.358	1.105	1.606
	Hedges' correction	0.767	1.349	1.098	1.596
	Cohen's d	0.707	1.617	1.341	1.890

10.2) Organisational commitment is an indicator of a good organisational culture	Hedges' correction	0.712	1.607	1.332	1.878
10.3) Innovation is an indicator of a good organisational culture	Cohen's d	0.775	1.575	1.303	1.844
	Hedges' correction	0.780	1.565	1.294	1.832
10.4) The effective utilisation of technological sub-systems to turn inputs into outputs is an indicator of a good organisational culture	Cohen's d	0.826	1.169	0.933	1.402
	Hedges' correction	0.832	1.162	0.927	1.393
10.5) The extent to which different elements of the total reward framework are implemented according to occupational group preferences is an indicator of a good organisational culture	Cohen's d	0.844	0.974	0.754	1.192
	Hedges' correction	0.849	0.968	0.749	1.185
10.6) Effective leadership is an indicator of a good organisational culture	Cohen's d	0.581	2.612	2.231	2.990
	Hedges' correction	0.585	2.595	2.216	2.971
10.7) The clan/group culture type as described by the Competing Values Framework is an indicator of a good organisational culture	Cohen's d	0.818	1.077	0.849	1.303
	Hedges' correction	0.824	1.070	0.843	1.294
10.8) Organisational culture is an indicator of organisational success	Cohen's d	0.827	1.405	1.148	1.658
	Hedges' correction	0.832	1.396	1.141	1.647
11.1) Job satisfaction is an indicator of	Cohen's d	0.873	1.048	0.822	1.272
	Hedges' correction	0.879	1.042	0.817	1.264


transformational leadership					
11.2) Organisational commitment is an indicator of transformational leadership	Cohen's d	0.770	1.386	1.131	1.637
	Hedges' correction	0.775	1.377	1.124	1.627
11.3) Organisational learning is an indicator of transformational leadership	Cohen's d	0.670	1.707	1.422	1.989
	Hedges' correction	0.675	1.696	1.413	1.976
11.4) A clearly defined purpose is an indicator of transformational leadership	Cohen's d	0.678	1.888	1.585	2.188
	Hedges' correction	0.682	1.875	1.574	2.173
11.5) Transformational leadership is an indicator of organisational success	Cohen's d	0.752	1.712	1.427	1.995
	Hedges' correction	0.757	1.701	1.418	1.982
12.1) Organisational citizenship behaviour is an indicator of ethical leadership	Cohen's d	0.698	1.397	1.142	1.650
	Hedges' correction	0.702	1.388	1.134	1.639
12.2) Corporate social responsibility is as an indicator of ethical leadership	Cohen's d	0.804	1.306	1.059	1.551
	Hedges' correction	0.810	1.298	1.052	1.541
12.3) Ethical leadership is an indicator of organisational success	Cohen's d	0.710	1.909	1.603	2.211
	Hedges' correction	0.715	1.896	1.593	2.197
13.1) Enhanced employee performance is an indicator of ethical leadership	Cohen's d	0.730	1.475	1.212	1.734
	Hedges' correction	0.735	1.465	1.204	1.723
13.2) Work engagement is an indicator of ethical leadership	Cohen's d	0.697	1.496	1.232	1.758
	Hedges' correction	0.701	1.487	1.224	1.746
13.3) Organisational commitment is an indicator of ethical leadership	Cohen's d	0.710	1.396	1.141	1.649
	Hedges' correction	0.715	1.387	1.134	1.638
	Cohen's d	0.973	0.592	0.395	0.787

13.4) Reduced staff turnover is an indicator of ethical leadership	Hedges' correction	0.979	0.588	0.393	0.782
13.5) Increased trust is an indicator of authentic leadership	Cohen's d	0.652	2.027	1.710	2.342
	Hedges' correction	0.656	2.014	1.699	2.327
13.6) Authentic leadership is an indicator of organisational success	Cohen's d	0.703	1.771	1.480	2.059
	Hedges' correction	0.708	1.760	1.470	2.046
14.1) A good organisational culture is an indicator of an effective overall leadership influence	Cohen's d	0.618	2.291	1.945	2.634
	Hedges' correction	0.622	2.276	1.933	2.617
14.2) Overall leadership influence is an indicator of organisational success	Cohen's d	0.662	2.060	1.739	2.378
	Hedges' correction	0.667	2.047	1.728	2.363
15.1) The presence of an HRIS is an indicator that an organisation is on the path to better management of its human resources information	Cohen's d	0.730	1.673	1.391	1.951
	Hedges' correction	0.734	1.662	1.382	1.939
15.2) Usage of an HRIS by its users is an indicator of the effectiveness of the HRIS	Cohen's d	0.849	1.268	1.024	1.509
	Hedges' correction	0.854	1.260	1.017	1.499
15.3) Reduction in administration levels is an indicator of the effective use of an HRIS	Cohen's d	0.735	1.567	1.296	1.836
	Hedges' correction	0.740	1.557	1.288	1.824
15.4) Storing of information on an HRIS promotes access to information across the organisation	Cohen's d	0.658	1.971	1.660	2.280
	Hedges' correction	0.662	1.959	1.649	2.265
15.5) Analytics conducted using an HRIS is an	Cohen's d	0.739	1.686	1.403	1.966
	Hedges' correction	0.744	1.675	1.394	1.953

indicator of the effective use of the HRIS					
15.6) Data drawn from an HRIS can be used as an indicator of the presence of organisational success factors within an organisation	Cohen's d	0.758	1.432	1.173	1.687
	Hedges' correction	0.762	1.423	1.166	1.677
15.7) The effective use of HRIS is an indicator of organisational success	Cohen's d	0.777	1.473	1.211	1.733
	Hedges' correction	0.782	1.464	1.203	1.722
16.1) Employee engagement is an indicator of organisational success	Cohen's d	0.675	2.021	1.704	2.335
	Hedges' correction	0.680	2.008	1.693	2.320
16.2) Change capability is an indicator of organisational success	Cohen's d	0.673	1.939	1.630	2.244
	Hedges' correction	0.678	1.926	1.620	2.230
17.1) Employees who have been with the organisation for a shorter period tend to show higher levels of job satisfaction than employees who have been with the organisation for a longer period	Cohen's d	1.152	0.154	-0.027	0.336
	Hedges' correction	1.159	0.153	-0.027	0.334
17.2) Older employees tend to be generally more satisfied with their jobs than younger employees	Cohen's d	1.040	0.326	0.140	0.511
	Hedges' correction	1.046	0.324	0.139	0.507
17.3) Females generally have higher levels of job satisfaction than males	Cohen's d	1.043	-0.171	-0.352	0.011
	Hedges' correction	1.050	-0.170	-0.350	0.011
17.4) Older employees tend to show higher levels of organisational commitment than	Cohen's d	1.043	0.658	0.458	0.856
	Hedges' correction	1.050	0.654	0.455	0.850

younger employees					
17.5) Females generally have higher levels of organisational commitment than males	Cohen's d	1.040	0.163	-0.019	0.344
	Hedges' correction	1.047	0.162	-0.019	0.342

## Annexure B. Ethical Clearance



**UNISA IOP ETHICS REVIEW COMMITTEE**

Date: 26 January 2021

Dear Mr Jason Bonehill

NHREC Registration # : (if applicable)  
ERC Reference : **2020\_CEMS\_IOP\_038**  
Name : Mr. Jason Bonehill  
Student # : 61934410  
Staff # : NA

**Decision: Ethics Approval from  
01 February 2021 to 01  
February 2026**

---

**Researcher(s)**: Name: Mr Jason Bonehill  
E-mail address, telephone: [jason\\_bonehill@yahoo.com](mailto:jason_bonehill@yahoo.com), 083 596 5917

**Supervisor (s)**: Name: Prof Nico Martins  
E-mail address, telephone: [martinsn@mweb.co.za](mailto:martinsn@mweb.co.za), 083 266 6372

**Use of Human Resource Information Systems in the measurement of  
Organisational Success Factors**

**Qualification**: Doctor of Philosophy (PhD) – Postgraduate degree


---

Thank you for the application for research ethics clearance to the Unisa IOP Ethics Review Committee for the above-mentioned research. Ethics approval is granted for a period of **Five (5) years**.

*The **low risk application** was **reviewed** by the IOP Research Ethics Review Committee on 26 January 2021 in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment. The Ethics Application was approved on 01 February 2021.*

The proposed research may now commence with the provisions that:

- The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa COVID-19 Position Statement on research ethics dated 26 June 2020 which is attached.***



University of South Africa  
Pretorius Street, Muckleneuk Ridge, City of Tshwane  
PO Box 392 UNISA 0003 South Africa  
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150  
[www.unisa.ac.za](http://www.unisa.ac.za)



**2. All data-gathering must adhere to and be aligned with restrictions applicable to the Government's current Lockdown Alert Levels.**

3. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
4. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the Unisa CEMS/IOP Research Ethics Review Committee.
5. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
6. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing, accompanied by a progress report.
7. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
8. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
9. No field work activities may continue after the expiry date **(01 February 2026)**. Submission of a complete research ethics progress report will constitute an application for the renewal of Ethics Research Committee approval.

*Note:*

*The reference number **Bonehill\_2020\_CEMS\_IOP\_038** should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Yours sincerely,



Signature

Chair of IOP ERC

**E-mail:** [vnika2@unisa.ac.za](mailto:vnika2@unisa.ac.za)

**Tel:** (012) 429-8231



Signature

Executive Dean: CEMS

**E-mail:** [moqalmt@unisa.ac.za](mailto:moqalmt@unisa.ac.za)

**Tel:** (012) 429-4805



URERC 16.04.29 - Decision template (V2) - Approve

University of South Africa  
Pretter Street, Muckleneuk Ridge, City of Tshwane  
PO Box 392 UNISA 0003 South Africa  
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150  
[www.unisa.ac.za](http://www.unisa.ac.za)

## Annexure C. Questionnaire

UNISA 

### **Quantitative survey** **Introduction and Context**

Ethical clearance #: **2020\_CEMS\_IOP\_038**

#### **COVER LETTER TO AN ONLINE ANONYMOUS WEB-BASED SURVEY**

Dear Prospective Participant,

You are invited to participate in a survey conducted by Jason Bonehill under the supervision of Professor Nico Martins a professor in the Department of Industrial Psychology towards a PhD at the University of South Africa.

The survey you have received has been designed to study the use of Human Resource Information Systems in the measurement of Organisational Success Factors (OSFs). You were selected to participate in this survey because of your experience and knowledge of the areas of research. By completing this survey, you agree that the information you provide may be used for research purposes, including dissemination through peer-reviewed publications and conference proceedings.

It is anticipated that the information we gain from this survey will help us to create a model on the use of HRIS in measuring OSFs. You are, however, under no obligation to complete the survey and you can withdraw from the study prior to submitting the survey. The survey is developed to be anonymous, meaning that we will have no way of connecting the information that you provide to you personally. Consequently, you will not be able to withdraw from the study once you have clicked the send button based on the anonymous nature of the survey. If you choose to participate in this survey it will take up no more than 30 minutes of your time. You will benefit from your participation as an individual, as it is envisioned that the findings of this study will assist with the creation of a model on the use of HRIS and their use in providing an indication of OSFs. We do not foresee that you will experience any negative consequences by completing the survey. The researcher undertakes to keep any information provided herein confidential, not to let it out of our possession and to report on the findings from the perspective of the participating group and not from the perspective of an individual.

The records will be kept for five years for audit purposes where after it will be permanently destroyed, and any electronic versions will be permanently deleted. You will not be reimbursed or receive any incentives for your participation in the survey.

1

The research was reviewed and approved by the UNISA-CAES Health Research Ethics Committee. The primary researcher, Jason Bonehill, can be contacted during office hours at 083 596 5917. The study leader, Professor Nico Martins, can be contacted during office hours at [martinsn@mweb.co.za](mailto:martinsn@mweb.co.za). Should you have any questions regarding the ethical aspects of the study, you can contact the chairperson of the Committee, Prof MA Antwi, at 011-670-9391 or [antwima@unisa.ac.za](mailto:antwima@unisa.ac.za) . Alternatively, you can report any serious unethical behaviour at the University's Toll Free Hotline 0800 86 96 93.

You are making a decision whether or not to participate **by continuing to the next page**. You are free to withdraw from the study at any time prior to clicking the submit button.

## Quantitative survey

Dear participant to better assist with the analysis of results please answer the following demographic questions:

\* 1. What is your age?

- |                             |                                 |
|-----------------------------|---------------------------------|
| <input type="radio"/> 18-24 | <input type="radio"/> 45-54     |
| <input type="radio"/> 25-34 | <input type="radio"/> 55-64     |
| <input type="radio"/> 35-44 | <input type="radio"/> 65 & Over |

\* 2. Please classify your Race

- |                                    |                                 |
|------------------------------------|---------------------------------|
| <input type="radio"/> African - A  | <input type="radio"/> White - W |
| <input type="radio"/> Coloured - C | <input type="radio"/> Other - O |
| <input type="radio"/> Indian - I   |                                 |

\* 3. What is your Gender?

- Female
- Male
- Identifies as another classification

\* 4. What is your highest qualification?

- |   |  |
|---|--|
| <input type="radio"/> Below Matric                | <input type="radio"/> Postgraduate below Masters |
| <input type="radio"/> Matric                      | <input type="radio"/> Masters                    |
| <input type="radio"/> A or O Levels               | <input type="radio"/> Doctorate                  |
| <input type="radio"/> Undergraduate qualification |  |

**\* 5. Please select your country of residence**

- Swaziland
- Mozambique
- Malawi
- Botswana
- Angola
- Namibia
- Other (please specify)
- South Africa
- Zambia
- Lesotho
- Zimbabwe
- Tanzania
- DRC

## Quantitative survey

Dear participant to enable you to provide feedback on the items for the survey, please read the definitions of terms before each set of items carefully to ensure you understand them.

\* 6. Please rate the following using the provided rating scale and using the definition of terms below:

**Job satisfaction** - “As a pleasurable or positive emotional state resulting from the appraisal of one’s job and job experiences and as a function of the perceived relationship between what one wants from one’s job and what one perceives as it offering.” (Locke, 1976)

**Organisational commitment** - “the relationship that exists between an individual and an organisation, attachment, identification with the organisation, the need to remain and the will to work hard to meet the organisational goals” (Ndlovu, Ngirande, Setati, & Zhuwao, 2018, p. 2)

**Organisational success** - “Refers to an organisation’s ability to attain its goals by using resources in an efficient and effective manner” (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
6.1) Low voluntary turnover is an indicator of higher job satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.2) Low absenteeism is an indicator of higher job satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
6.3) Organisational commitment is an indicator of higher job satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.4) The content of a job enhances employees' job satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.5) Higher Pay is an indicator of higher job satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.6) Job satisfaction is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 7. Please rate the following using the provided rating scale and using the definition of terms below:**

**Job satisfaction** - "As a pleasurable or positive emotional state resulting from the appraisal of one's job and job experiences and as a function of the perceived relationship between what one wants from one's job and what one perceives as it offering." (Locke, 1976)

**Organisational commitment** - "the relationship that exists between an individual and an organisation, attachment, identification with the organisation, the need to remain and the will to work hard to meet the organisational goals" (Ndlovu, Ngirande, Setati, & Zhuwao, 2018, p. 2)

**Total reward elements** - Performance management, compensation, benefits, recognition, talent development and career opportunities (Mabaso & Dlamini, 2018) (Ndlovu, Ngirande, Setati, & Zhuwao, 2018)

**Organisational success** - "Refers to an organisation's ability to attain its goals by using resources in an efficient and effective manner" (Daft, 2000 in Ejere & Abasilim, p. 31).



	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
7.1) Low voluntary turnover is an indicator of higher organisational commitment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.2) Low absenteeism is an indicator higher of organisational commitment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.3) Job satisfaction is an indicator of higher organisational commitment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.4) The implementation of total rewards elements enhances organisational commitment amongst employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.5) Organisational commitment is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 8. Please rate the following using the provided rating scale and using the definition of terms below:

**Knowledge management** – “Generation, representation, storage, transfer, transformation application, embedding, and protecting of organisational knowledge” (Cao, Thompson, & Triche, 2013).

**Elements of a knowledge management system** – Data quality, locatability of data, authorisation, compatibility between systems, production timeliness, training and ease of use, system reliability, and

relationship with user (Goodhue and Thompson, 1995) in (Cao, Thompson, & Triche 2013).

**Continued professional development (CPD)** - Emphasis's on continuous lifelong learning (Puteh, 2017)

**Knowledge management** - "Generation, representation, storage, transfer, transformation application, embedding, and protecting of organisational knowledge" (Cao, Thompson, & Triche, 2013).

**Organisational learning** - "Organisations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together" (Jaaron & Backhouse, 2017, p. 3).

**Organisational success** - "Refers to an organisation's ability to attain its goals by using resources in an efficient and effective manner" (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
8.1) Technology used to support knowledge management is an indicator of effective knowledge management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.2) Elements of a good knowledge management system are an indicator of effective knowledge management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
8.3) Continuous Professional Development (CPD) activities within an organisation are an indicator of effective learning management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.4) Job satisfaction is an indicator of effective organisational learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.5) Knowledge management is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.6) Organisational Learning is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 9. Please rate the following using the provided rating scale and using the definition of terms below:**

**Capability maturity model (CMM)** – A means of categorising organisational maturity relating to its processes, initially on software development but was later used for different purposes. The model uses the following five maturity levels to classify organisations (Kalinowski, 2016):

- **Initial** – Processes are informal and not planned
- **Repeatable** – Processes are documented and can be repeated
- **Defined** – Processes are standardised across the organisation
- **Managed** – Processes are managed quantitatively according to prescribed metrics
- **Optimized** – Measurement of processes lays the foundation for continued improvement and optimisation

**Business process** – “A set of activities that transformed a set of inputs into a set

of outputs for another person using people and equipment” (Oladimeji, Akingunola, & Sanusi, 2017)

**Organisational success** – “Refers to an organisation’s ability to attain its goals by using resources in an efficient and effective manner” (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
9.1) The defined level described by the Capability Maturity Model (CMM) is an indicator of mature business processes within an organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.2) Processes that have been mapped out are an indicator of business processes being mature within an organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.3) An organisation that has structured itself to focus on process improvement is an indicator of business processes being mature within an organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.4) Mature business processes are indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 10. Please rate the following using the provided rating scale and using the definition of terms below:

**Job satisfaction** - "As a pleasurable or positive emotional state resulting from the appraisal of one's job and job experiences and as a function of the perceived relationship between what one wants from one's job and what one perceives as it offering." (Locke, 1976)

**Organisational commitment** - "the relationship that exists between an individual and an organisation, attachment, identification with the organisation, the need to remain and the will to work hard to meet the organisational goals" (Ndlovu, Ngirande, Setati, & Zhuwao, 2018, p. 2)

**Technological sub systems** - "The specialised knowledge, skills, machines, equipment and layout of the facilities that are used in the transformation from inputs to outputs. This can also be seen as a subsystem of artefacts and creations" Martins (1987) and Kekwaletswe & Ncube (2018).

**Occupational Group:** "a body of people doing the same kind of work" (<https://www.vocabulary.com/dictionary/occupational%20group#:~:text=Definitions%20of%20occupational%20group,synonyms%3A%20vocation>)

**Total reward elements** - Performance management, compensation, benefits, recognition, talent development and career opportunities (Mabaso & Dlamini, 2018) (Ndlovu, Ngirande, Setati, & Zhuwao, 2018)

**Competing values framework types** - "Each quadrant represents a particular type of organisational culture denominated by authors as clan or group, adhocracy, hierarchy and market (Belac, Košmrlj, & Markič, 2017) (Hartnell, Ou, Kinicki, Choi, & Karam, 2019):

- **Hierarchy** - "In this organisation, the internal environment is very structured and formalised, where actions determine human behaviour. Leaders are good and efficient coordinators and organisers"
- **Market** - "Is significant for the organisation with the orientation towards social environment, external stakeholders and exchange relations"
- **Clan/Group** - "Organisation is a friendly work environment, where the participants feel like part of the family and share the good and the bad."
- **Adhocracy** - "Is significant for the dynamic organisation with entrepreneurial spirit and creative business environment. The term ad hoc itself implies something right now, dynamic, and specific. Co-workers expose themselves and accept the risks"

**Organisational culture** – “A shared set of norms, understandings, values and behaviours that direct and guide employees on what is acceptable behaviour, ways of thinking and communicating within the organisation” (Ostroff et al., 2013; Schein, 2010) in (Hartnell, Lambert, Kinicki, & Fugate, 2016)

**Organisational success** – “Refers to an organisation’s ability to attain its goals by using resources in an efficient and effective manner” (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
10.1) Job satisfaction is an indicator of a good organisational culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.2) Organisational commitment is an indicator of a good organisational culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.3) Innovation is an indicator of a good organisational culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.4) The effective utilisation of Technological Sub Systems to turn inputs into outputs is an indicator of a good organisational culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
10.5) The extent to which different elements of the total reward framework are implemented according to occupational group preferences is an indicator of a good organisational culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.6) Effective leadership is an indicator of a good organisational culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.7) The Clan/Group culture type as described by the Competing Values Framework is an indicator of a good organisational culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.8) Organisational Culture is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Quantitative survey

\* 11. Please rate the following using the provided rating scale and using the definition of terms below:

**Job satisfaction** - “As a pleasurable or positive emotional state resulting from the appraisal of one’s job and job experiences and as a function of the perceived relationship between what one wants from one’s job and what one perceives as it offering.” (Locke, 1976)

**Organisational commitment** - “the relationship that exists between an individual and an organisation, attachment, identification with the organisation, the need to remain and the will to work hard to meet the organisational goals” (Ndlovu, Ngirande, Setati, & Zhuwao, 2018, p. 2)

**Organisational learning** - “Organisations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together” (Jaaron & Backhouse, 2017, p. 3).

**Transformational leadership** - “Leaders with an appealing vision for their team who intellectually stimulate others in a way that is demanding and are appreciative of the individual needs of the team members” (Yukl, 2013)

**Organisational success** - “Refers to an organisation’s ability to attain its goals by using resources in an efficient and effective manner” (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
11.1) Job satisfaction is an indicator of Transformational Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
11.2) Organisational commitment is an indicator of Transformational Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.3) Organisational learning is an indicator of Transformational Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.4) A clearly defined purpose is an indicator of Transformational Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.5) Transformational Leadership is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 12. Please rate the following using the provided rating scale and using the definition of terms below:

**Organisational citizenship behaviour** – “The extra-role, discretionary behaviour that helps other members in the organisation to perform their jobs. OCB also includes showing support and conscientiousness towards the organisation” (Smith et al, 1983; Bateman and Organ 1983; Borman and Motowidlo 1993) in (Suan, Anantharaman & Kin, 2015).

**Corporate social responsibility** – “The social responsibility of business encompasses the economic, legal, ethical, and discretionary [later referred to as philanthropic] expectations that society has of organizations at a given point in time” Fordham and Robinson (2018) (synthesis of Carroll 1979, p. 500; 1991, p. 283).

**Ethical leadership** – “The demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct to followers through two-way communication, reinforcement, and decision making” (Brown Treviño, & Harrison, 2005, p. 120) in Choi, Ullah and Kwak (2015).

**Organisational success** – “Refers to an organisation’s ability to attain its goals by using resources in an efficient and effective manner” (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
12.1) Organisational Citizenship Behaviour is an indicator of Ethical Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12.2) Corporate Social Responsibility is as an indicator of Ethical Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12.3) Ethical Leadership is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 13. Please rate the following using the provided rating scale and using the definition of terms below:

**Organisational commitment** – “the relationship that exists between an individual and an organisation, attachment, identification with the organisation, the need to remain and the will to work hard to meet the organisational goals” (Ndlovu, Ngirande, Setati, & Zhuwao, 2018, p. 2)

**Authentic leadership** – “Which focuses on leaders being guided by sound moral convictions and acting in accordance with deeply held values” (Avolio et al., 2009; Gardner et al. 2011)” in (Wei, Li, Zhang, & Liu, 2018, p. 763)

**Organisational success** – “Refers to an organisation’s ability to attain its goals by using resources in an efficient and effective manner” (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
13.1) Enhanced employee performance is an indicator of Authentic Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.2) Work Engagement is an indicator of Authentic Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.3) Organisational commitment is an indicator of Authentic Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.4) Reduced Staff Turnover is an indicator of Authentic Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.5) Increased Trust is an indicator of Authentic Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
<b>13.6) Authentic Leadership is an indicator of organisational success</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p><b>* 14. Please rate the following using the provided rating scale and using the definition of terms below:</b></p> <p><b>Organisational culture</b> - “A shared set of norms, understandings, values and behaviours that direct and guide employees on what is acceptable behaviour, ways of thinking and communicating within the organisation” (Ostroff et al., 2013; Schein, 2010) in (Hartnell, Lambert, Kinicki, &amp; Fugate, 2016)</p> <p><b>Organisational success</b> - “Refers to an organisation’s ability to attain its goals by using resources in an efficient and effective manner” (Daft, 2000 in Ejere &amp; Abasilim, p. 31).</p>					
	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
<b>14.1) A good organisational culture is an indicator of an effective overall leadership influence</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>14.2) Overall Leadership influence is an indicator of organisational success</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p><b>* 15. Please rate the following using the provided rating scale and using the definition of terms below:</b></p> <p><b>Human Resource Information System (HRIS)</b> - “The system used to acquire, store, manipulate, analyse, retrieve and distribute pertinent information regarding an organisation’s human resources” (Qaisar, Shahzad, &amp; Arif, 2018).</p> <p><b>Organisational success</b> - “Refers to an organisation’s ability to attain its goals by using resources in an efficient and effective</p>					

manner” (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 – Strongly Agree	2 – Agree	3 – Neither agree nor disagree	4 – Disagree	5 – Strongly Disagree
15.1) The presence of an HRIS is an indicator that an organisation is on the path to better management of its human resources information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.2) Usage of an HRIS by its users is an indicator of the effectiveness of the HRIS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.3) Reduction in Administration levels is an indicator of the effective use of an HRIS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.4) Storing of information on an HRIS promotes access to information across the organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.5) Analytics conducted using an HRIS is an indicator of the effective use of the HRIS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
15.6) Data drawn from an HRIS can be used as an indicator of the presence of Organisational Success Factors within an organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.7) The effective use of HRIS is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 16. Please rate the following using the provided rating scale and using the definition of terms below:

**Employee engagement:** "is the extent to which employees feel passionate about their jobs, are committed to the organization, and put discretionary effort into their work" (<https://www.custominsight.com/employee-engagement-survey/what-is-employee-engagement.asp>)

**Change capability:** "Change capability is the ability of an organization to plan, design, and implement all types of change efficiently with committed stakeholders, causing minimal negative impacts on people and operations, so that desired business and cultural results from change are consistently achieved and integrated seamlessly into operations to deliver maximum ROI" (Anderson & Anderson, 2001).

**Organisational success** - "Refers to an organisation's ability to attain its goals by using resources in an efficient and effective manner" (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
16.1) Employee Engagement is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.2) Change capability is an indicator of organisational success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 17. Please rate the following using the provided rating scale and using the definition of terms below:

**Job satisfaction** - "As a pleasurable or positive emotional state resulting from the appraisal of one's job and job experiences and as a function of the perceived relationship between what one wants from one's job and what one perceives as it offering." (Locke, 1976)

**Organisational commitment** - "the relationship that exists between an individual and an organisation, attachment, identification with the organisation, the need to remain and the will to work hard to meet the organisational goals" (Ndlovu, Ngirande, Setati, & Zhuwao, 2018, p. 2)

**Organisational success** - "Refers to an organisation's ability to attain its goals

















by using resources in an efficient and effective manner” (Daft, 2000 in Ejere & Abasilim, p. 31).

	1 - Strongly Agree	2 - Agree	3 - Neither agree nor disagree	4 - Disagree	5 - Strongly Disagree
17.1) Employees who have been with the organisation for a shorter period tend to show higher levels of job satisfaction than employees who have been with the organisation for a longer period	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.2) Older employees tend to be generally more satisfied with their jobs than younger employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.3) Females generally have higher levels of job satisfaction than males	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.4) Older employees tend to show higher levels of organisational commitment than younger employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.5) Females generally have higher levels of organisational commitment than males	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Quantitative survey

**\* 18. For the following section, please rank the Organisational Success Factors in order of importance:**

 	Employee Engagement
 	Change Capability
 	Job Satisfaction
 	Organisational Commitment
 	Organisational Learning
 	Knowledge Management
 	Mature Business Processes
 	Organisational Culture



Transformational Leadership



Ethical Leadership



Authentic Leadership



Overall Leadership influence



Human Resource Information Systems

**\* 19. To what extent do you think there is a need to make use of HRIS data?**

- 1 - No need at all                       4 - There is a need
- 2 - Some need                               5 - Critical need
- 3 - Neutral

**\* 20. I would describe my HRIS exposure as:**

- 1 - None
- 2 - Some exposure
- 3 - Significant exposure

**\* 21. I would describe my understanding of HRIS as:**

- 1 - None
- 2 - Intermediate
- 3 - Advanced

**\* 22. Do you make use of HRIS data in fulfilling your responsibilities?**

- 1 - Never
  4 - Frequently  
 2 - Almost never
  5 - Almost every time  
 3 - Occasionally/Sometimes

**\* 23. How would you describe the quality of HRIS data you have used in general?**

- 1 - Poor  
 2 - Moderate  
 3 - Good

**\* 24. Where does HRIS data add the greatest value?**

	1 - No value at all	2 - Some value	3 - Neutral	4 - Value added	5 - Critical
24.1) To slice and dice information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.2) To inform decision making and provide insights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.3) To assist with the composition of teams for projects and events	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.4) For career development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.5) For compliance and financial benefits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>