CHINHOYI UNIVERSITY OF TECHNOLOGY

DEVELOPING A PREDICTIVE MODEL FOR HUMAN CAPITAL ANALYTICS ADOPTION IN ZIMBABWEAN STATE UNIVERSITIES

BY

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ABSTRACT

The use of human resource analytics is meant to improve performance of organisations by enabling them to predict and direct business outcomes and employee behaviour. However there is a problem of under-utilization of human resource analytics in state universities. The present study, therefore, sought to improve the use of human resource analytics by developing a predictive model for adoption of human capital analytics in Zimbabwean state universities. A quantitative research strategy anchored on the positivism philosophy was used in this treatise. A sample size of 434 research subjects selected through stratified random sampling method and snowball sampling technique of was used in this study. Structured questionnaires, key informant interviews and documentary review were used as the data collection tools for the study. Descriptive and inferential statistical techniques, using exploratory factor analysis and structural equation modeling were done for primary data. The results of the study supported the hypothesized relationship between top management support and lack of human resource analytics competency. The study established that there is no significant relationship between top management support and level of human capital analytics adoption in state universities. The hypothesis that there is a significant relationship between lack of human resource analytics competency and level of human capital analytics adoption in state universities was not supported by the data. The alternate hypothesis of length of time using human resource information system affecting level of adoption of human capital analytics in the organization was rejected. Key informant interviews and documentary review indicated a descriptive level of human capital analytics adoption in Zimbabwean state universities. Resistance to change, negative organizational structure and perceived cost were discovered as impeding factors towards full adoption of human capital analytics.The findings indicate that Human resource experts are capable of producing human resource analytics reports, albeit at an early stage (descriptive analytics). This means that top management assistance is critical in boosting HR professionals' and the organization's overall human resource analytics proficiency level. A model for human resource analytics adoption was produced and links human and organizational dimension factors. Literature on human resource analytics should focus on factors revealed by the study's quantitative and qualitative findings. Hence, the present theory (resource-based view) should be revised to accommodate this discovery. It is suggested that senior management in state institutions would focus on training key personnel on how to use technical tools. Policies outlining how HR practice reports should be done would also be an important element of the training endeavor. Change management strategies and organizational structure improvements would be implemented.

Keywords: *Human resource analytics,human capital analytics, people analytics, talent analytics, workforce analytics*

LIST OF ACRONYMS

HRA-Human resource analytics

HCA-human capital analytics

HRIS-Human resources information systems

SEM- Structural equation modeling

JASP- Jeffrey Amazing Statistical Program

TOE- Technology-Organization-Environment

TAM- Technology Acceptance Model

CIPD-Chartered Institute of Personnel Development

BI-Business Intelligence

USA-United States of America

SAP- Systems Application and Products

UK-United Kingdom

IBM-International Business Machines Corporation

HR-Human Resource

ROI- Return on investment

UNESCO-United Nations Education, Scientific and Cultural Organization

HRM-Human resource management

SPSS-Statistical Package for the Social Sciences

IT-Information Technology

ERP-Enterprise resource planning

HCCS- Human capital capability scorecard

TRA-Theory of Reasoned Action

RBV- Resource-based view

LAMP-Logic, Analytics, Measures and Process

UTAUT- Unified Theory of Acceptance and Use of Technology

SCA-Sustainable Competitive Advantage

ANOVA- Analysis of Variance

TLI-Tucker Lewis Index

NFI-Normed fit index

NNFI-None normed fit index

SRMR-Standardized root mean square residual

RMSEA-Root mean square error of approximation

AIC-Akaike information criterion

BIC-Bayersian information criteria

AVE- Average variance extracted

LVC- Latent variable correlations

TPB-Theory of Planned Behavior

HIT-Health Information Technology

CAS- Complex adaptive system

HCIS- Human capital information systems

ZETDC-Zimbabwe electricity transmission distribution company

ZIMRA-Zimbabwe revenue authority

E-HRM-Electronic Human Resource Management

DOI-Diffusion of Innovation

ZIMSTAT-Zimbabwe Statistical Agency

IPC- Industrial Psychology Consultants

CI- Confidence interval

KMO-Kaiser-Meyer-Olkin

EFA-Exploratory factor analysis

CFA-Confirmatory factor analysis

CUT-Chinhoyi university of technology

MSU-Midlands state university

ML- Maximum likelihood

MSS - Management Self-Service

SOE-State Owned Enterprises

NRZ- National Railways of Zimbabwe

NSSA-National Social Security Authority

VRIO- Valuable, rare, low imitability, and organized

AMO- Ability, Motivation, and Opportunity

ZOU-Zimbabwe Open University

HRBP-Human resource business partners

KSAS-Knowledge, Skills and Abilities

DEFINITION OF KEY TERMS

HR analytics

Marler and Boudreau (2017, p. 15.) defines HR analytics as ‘an HR practice enabled by information technology that uses descriptive, visual, and statistical analyses of data related to HR processes, human capital, organizational performance, and external economic benchmarks to establish business impact and enable data-driven decision-making’.

HRIS

Stands for Human Resources Information System. HRIS can be defined as integrated systems used to gather, store and analyze information regarding Zimbabwean state universities' human resources.

Human resource professionals

People who perform a plethora of tasks in Zimbabwean state universities and theses tasks range from recruiting, managing employee relations and creating company policies among other essential people management tasks.

HRA adoption

Means the acceptance of human resource analytics from descriptive to prescriptive level in Zimbabwean institutions of higher learning by both top management and human resource professionals.

Zimbabwean State Universities

High level educational establishments in which students study for diverse certificates, degrees and scholarly research is done. These institutions are government created and controlled, they have one Chancellor who is the President of the Republic of Zimbabwe.

Descriptive analytics

A commonly used form of data analysis whereby historical data is collected, organized and then presented in a way that is easily understood through pie charts, graphs and tables. This category of analytics focus only on what has already happened in a business and, unlike other methods of analysis, it is not used to draw inferences or predictions from its findings. Descriptive analytics uses simple maths and statistical tools, such as arithmetic, averages and per cent changes, rather than complex calculations necessary for predictive and prescriptive analytics.

Predictive analytics

Predictive analytics is focused on foretelling and apprehension of what could happen in the future by analyzing past data patterns to predict what might happen going forward and, in doing so, inform many aspects of a business, including setting realistic goals, effective planning, managing performance expectations and avoiding risks (Edwards *et al.*, 2022). Mostly, predictive analytics is based on probabilities. Thus, using a variety of techniques such as statistical modeling, classification and regression, predictive analytics attempts to forecast possible future outcomes and the likelihood of events in an organization.

Prescriptive analytics

Also called optimization analytics and takes predictive data to the next level which includes achieving the best outcomes by using limited resources. It involves using linear programming; simulations, creating mathematical modeling and implementation to find best alternatives in business management, for example, training investment to achieve organizational effectiveness.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Human resource analytics (HRA) is defined as "human resource practice enabled by information technology that uses descriptive, visual, and statistical analyses of data related to Human Resource (HR) processes, organizational performance and external economic benchmarks to establish business impact and enable data-driven decision-making" (Marler & Boudreau, 2017, p.15) . From this definition, it is clear that the strategic role of HR analytics goes beyond reporting HR metrics and connects HR decisions and processes with organizational operations. Thus, these HR decisions and processes are not only based on sophisticated analysis of HR data, but involve data from different internal functions and even external data. In this regard, the analysis of the data requires respective information technology and employees with the necessary skills. As HR analytics collects and analyses data, a whole enterprise approach is needed. Specifically, human capital analytics helps data in constructing a storyline about key business practices. It is mining primary raw data for useful information ultimately relating the storyline to overall business goals(Mishra & Lama, 2016). Further, HRA helps in tracking projects, absenteeism, monitoring and managing schedule assignment, and tracking performance of each employee (ibid). Through the help of human capital analytics, various workforce planning can be made in a more strategic approach. Eventually, organizations can have an upper hand over their competitors, as human resources have always been the vital aspect of every organization. In contemporary research and practice, human capital analytics takes a variety of different labels and forms, showing that the subject matter is still under intense development(Marler & Boudreau, 2017). Some of the other labels are: talent analytics as indicated by Chartered Institute of Personnel Development(CIPD, 2013), workforce analytics(Lawler *et al.*, 2004), people analytics (Waber, 2013) and human resource intelligence (Falletta & Combs, 2020). Mishra and Lama (2016) and Marler and Boudreau (2017) used the terms human capital analytics and human resource analytics respectively. Borrowing from the aforesaid definitions, the researcher in this thesis adopted the label human capital analytics.

Precisely, this chapter covered key aspects pertaining to background of the study, statement of the problem and research objectives. Other key elements of the chapter include significance of the study, scope of the study, overview of the investigation and organisation of the study.

1.2 Background to the study

Industrial Revolution (1760 to 1913) brought a seismic change to the global economic landscape, and human capital analytics emerged as efforts to optimize output increased Chartered Institute of Personnel Development (CIPD), 2015). Frederick Winslow Taylor developed a scientific management methodology anchored on four principles. Specifically, the principles involve use of methods based on a scientific study of the tasks, scientifically selecting, training, and developing each employee. Lastly, applying scientific management principles to workforce planning and supervising each employee in detail for each of their separate tasks and providing performance feedback. Guided accordingly by the scientific management methodology, production was analysed by the minute for each task to increase production and improve worker conditions. Certainly, this phenomenon marked one of the first known usages of human capital analytics in the corporate business world (Cascio & Boudreau, 2014).

Analytics can be categorized as descriptive, predictive and prescriptive or optimization analytics (Narula, 2015). Descriptive analytics is a commonly used form of data analysis whereby historical data is collected, organized and then presented in a way that is easily understood. This category of analytics focus only on what has already happened in a business and, unlike other methods of analysis, it is not used to draw inferences or predictions from its findings. Descriptive analytics is, rather, a foundational starting point used to inform or prepare data for further analysis down the line. As the most simplistic form of data analytics, descriptive analytics uses simple maths and statistical tools, such as arithmetic, averages and per cent changes, rather than complex calculations necessary for predictive and prescriptive analytics (Fitz-enz & Mattox, 2014) . Generally, visual tools such as line graphs and pie and bar charts are used to present findings, meaning descriptive analytics can and should be easily understood by a wide business audience.

Practically, descriptive analytics is frequently used in the day-to-day operations of an organization. Company reports such as those on inventory, work-flow, sales and revenue are all examples of descriptive analytics that provide a historical review of an organization's operations. Data collected by these kinds of reports can be easily aggregated and used to create snapshots of an organization's operations (Margherita, 2022) . Equally, comments that people post on company face-book page are also examples of descriptive analytics and can be used to better understand user attitudes. Similarly, a headcount report of all employees within the organization is a form of descriptive analytics. Even taking it a step further to break it down by demographics would still be in the same category. In a hospital setting, for instance, say that an unusually high number of people are admitted to the emergency room in a short period of time. In this regard, descriptive analytics provides real-time data with all the corresponding statistics in the form of date of occurrence, volume and patient details. Along the same line of logic, more sophisticated metrics like turnover rates would be descriptive as well. They rely on the past and aim to explain why something already happened.

The second level of analysis is Predictive analytics. While descriptive analytics focuses on historical data, predictive analytics, as its name implies, is focused on predicting and understanding what could happen in the future. Analyzing past data patterns can predict what might happen going forward and, in doing so, inform many aspects of a business, including setting realistic goals, effective planning, managing performance expectations and avoiding risks (Edwards *et al*., 2022). Largely, predictive analytics is based on probabilities. Thus, using a variety of techniques such as statistical modelling (mathematical relationships between variables to predict outcomes) and classification and regression predictive analytics attempts to forecast possible future outcomes and the likelihood of those events. Since predictive analytics can tell a business what could happen in the future, this methodology empowers executives and managers to take a more proactive, data-driven approach to business strategy and decision making. Logically, businesses can use predictive analytics for anything from forecasting customer behaviour and purchasing patterns to identifying sales trends. Back to the hospital example given above, predictive analytics may forecast a surge in patients admitted to the emergency room of the hospital in the next several weeks.

Based on patterns in the data, the illness could be said to be spreading at a rapid rate. In predictive analytics, data is also collected but is used to make future predictions about employees or HR initiatives. This can include anything from predicting which candidates would be more successful in the organization and who would be at risk of quitting within a year. Historical data can pinpoint reasons for poor performance, but predictive analytics can make predictions about what initiatives are most likely to improve performance in an organization. If engagement levels are identified as being correlated with performance, then organizations can implement specific initiatives that boost employee engagement. Predictive HR analytics enables organizations to become proactive in their use of data. Instead of fixing past problems, organizations can create a future that prevents problems and solves future challenges before they even happen(Falletta & Combs, 2011). This can save on future costs, both in revenue, goals, and productivity.

The third level of analysis is Prescriptive analytics/Optimization analytics and takes predictive data to the next level. This includes not only achieving the best outcomes by using limited resources. It involves using linear programming; simulations, creating mathematical modelling and implementation to find the best alternative training investment to achieve organizational effectiveness (Collmann &Matei, 2016). Now that one would have an idea of what will likely happen in the future, prescriptive analytics suggests various courses of action and the potential implications. Back to the hospital example:now that a medical practitioner knows that the illness is spreading, prescriptive analytics tool may suggest that hospital management have to increase the number of staff on hand to adequately treat the influx of patients.

In a nutshell, descriptive analytics look to the past to explain what happened and why it happened. Predictive analytics and prescriptive analytics use historical data to forecast what will happen in the future and what actions can be taken to affect those outcomes. Forward-thinking organizations use a variety of analytics together to make smart decisions that help them or in the case of the hospital example given, to save lives (Levenson, 2017). Nevertheless, different views on adoption challenges and benefits of HRA were proffered by international, regional and local scholars. (Ojokuku and Akanbi, 2015; Bersin, Leonard & Wang-Audia, 2017; Mpofu and Sebele, 2023).

Thus, ensuing paragraphs present brief findings of the aforesaid scholars and others in order to understand trends and current position of this study's subject matter.

1.2.1 The Global Perspectives

The total number of organizations globally using advanced human capital analytics is small and distributed unequally. A study by Bersin, Leonard & Wang-Audia (2017) in the United States of America (USA) has shown that only 10% of Fortune 500 companies are using advanced analytics. Out of this 10%, only 4% are using predictive and prescriptive analytics and remaining 6% are still restricted to basic statistical techniques for HR analytics.

An analysis of the adoption and use of human resource information systems (HRIS) and analytics in the public Universities in Saudi Arabia by Aletaibi (2016) indicated that there were six factors that affect the use of HRIS in the HR Departments of public universities. The factors were: usefulness, a speedier decision-making process, system quality, ease of use, subjective norms (social and peer pressures), and the unification of systems.The current level of use is affected by lack of customization, inadequate training, poor system, poor service quality and hindrances to the use and implementation of HRIS. Notwithstanding such challenges, it was found that HRIS and analytics use have a significant and positive impact on the performance and productivity of the HR Departments of public universities in Saudi Arabia.

Chahtalkhi's (2016) research study in the Netherlands revealed six categories of challenges faced by HR organizations when implementing HR analytics. The six categories were (1) lack of business/management support and interest, which implies that the business does not recognize the necessity of an HR analytics team and thus, does not consider its benefits and added value. Secondly, data and tools, which implies how to get the data, gaining a solid knowledge on which tools should be acquired as well as which methods are suitable for what kind of analytics techniques. Third, legal and compliance, (4), roles, which imply the roles that are needed to develop an HR analytics team, (5) training and skills, and (6) communication, which implies the lack of the right communication between the different entities.

The results illustrated that almost all three organizations that participated in the investigation mentioned these six categories of challenges, which they have been facing when implementing HR analytics within their organizations. Therefore, this research study assumed that when implementing HR analytics, such challenges might emerge.

Saxena *et al.* (2022) study shows that HR analytics adoption and acceptance is not a cakewalk. Certainly, an organization has to prepare its employees to adjust to new technology by supporting, encouraging, training, building the right attitude to bring change, and leading in an impactful manner.

Kiran *et al.*(2023) research study in India investigated the influence of human resource analytics on organizational performance in the service industry. It was discovered that HR analytics influence assorted human resources activities. The research also proved that HR analytics and HCM positively impact the performance of the organizations in the service industry.

Bahuguna *et al*.(2023) research findings based on literature survey and bibliometric analysis, reveal the path-breaking articles, the prominent authors, most contributing institutions and countries that have contributed to the HRA scholarship. The results show that the number of publications has significantly increased from since the last eight years, reaching a maximum of over hundred journals in 2021. The USA, China, India, Canada and the United Kingdom were the most productive countries in terms of the total number of publications. Human Resource Management Journal, Human Resource Management, International Journal of Manpower, and Journal of Organizational Effectiveness-People and Performance are the top four academic outlets in the field of HRA.

1.2.2 The African Perspectives

A research study by Ojokuku and Akanbi (2015) in Nigerian Public Universities revealed that a major challenge facing Nigerian public universities in the adoption of strategic human resources management incorporating human resource analytics is financial constraint. Despite advances in the application of analytics in business functions such as marketing and finance, HR analytics usage among South African public universities is still nowhere near where it could be.

It was found that South African organizations' usage of HR analytics is still in its infancy and that the concept and its implications are little understood (Molefe, 2013). Mushi's (2014) research study at Tanzania-Ardhi University (ARU) revealed that the current HR system had challenges which include human errors, delays, poor decision-making, inconsistencies, biases, favoritism, high cost, tediousness, corruption, and lacked transparency.

1.2.3 Zimbabwean perspectives

Mutanga and Siwadi (2013) research study in Zimbabwe found that HR practitioners in HR departments were grappling with traditional personnel management activities. The organizations' reports lacked the insights gathered through HR analytics. Mpofu and Sebele (2023) carried out a study on the perspective of top management towards human capital measurement and disclosure in the Zimbabwean mining sector. Obtained results reveal that top management is of the view that human capital has a strong relationship with the value of a company and its financial performance. They also indicated that the value of a company, its competitiveness, and economic growth is largely dependent on employee competencies (skills and expertise).

In spite of the big promise of human capital analytics, its real value and advantage continues to be a question mark, and relatively little published research exists about the issue. The above cited researches revealed the existence of time bound and knowledge gaps. Human resource analytics is a relatively novel intervention in the larger domain of human resource management (HRM). Hence, these aspects make the Zimbabwean context study an ideal ground for investigation of the topic.

1.2.4 Study Location and context

Zimbabwe, officially the Republic of Zimbabwe, formerly Rhodesia, is a landlocked country located in Southern Africa, between the Zambezi and Limpopo Rivers, bordered by South Africa, Botswana, Zambia and Mozambique.The capital and largest city is Harare. A country of roughly 14 million people, Zimbabwe has 16 official languages,with English, Shona, and Ndebele as the most common. The Zimbabwean university education system expanded rapidly from one institution at independence in 1980 to twelve state universities to date.

This expansion was partly due to the deliberate government policy to redress injustices of the colonial education system particularly with the bottle neck screening system used against the black majority (Garwe, 2013). Public higher education systems in Zimbabwe are historically heavily dependent on the fiscus (80%) for their capital and recurrent expenditures (Mutenga, 2012).The same author alluded that only 15% funding comes from the fees paid by students and 5% from other sources.The expansion of university education system brought several challenges such as limited and dwindling funding, poor infrastructure and lack of support in staff development programmes. In the past 5 years, Zimbabwe has been experiencing serious economic, social and political challenges and the government has failed to live up to its responsibility of supporting universities from the fiscus. Under-funding from the government has resulted in archaic and primordial technological equipment in higher institutions of learning (Gandawa,2016). Higher education system has immense social and public roles in national development. University graduates are meant to be critical mass citizens with relevant skills to solve intricate societal problems (Mutenga, 2012). Thus, university education should produce graduates with 21st century skills which include technological advancement (Chimbganda, 2014). Most Zimbabwean public universities adopted human resource information systems but mostly use descriptive analytics that focuses on mere reactive data presentations on tables, reports and metrics (CUT annual Report, 2017; MSU annual Report, 2020). Zimbabwean universities do not have people with the right skills set to gather, manage, and report on HR data and to identify the best HR technologies to keep track of the data.This thesis reckoned that human capital analytics could, if adopted and used well, leverage some of these challenges.

1.3 Statement of the problem

There is a problem of under-utilization of human capital analytics in state universities (researcher's experience). Many of these institutions collect and analyze relatively few types of HR data and engage in backwards-looking approach for reporting HR processes to executive management. Specifically, the problem manifests itself in the use of descriptive analytics that focus on mere reactive data presentations on tables, reports and metrics instead of predictive and optimization analytics (CUT annual Report, 2017; MSU annual Report, 2020).

This has resulted in failure by human resource professionals to focus on activities that place them in full strategic partnership with other key decision-makers within the organization. Human capital analytics usage is currently mostly limited to standard HR accounting and reporting (Pape, 2016). There is still an element of relying on gut feeling rather than using a statistical and analytical approach (ibid). Past researches (Ojokuku & Akanbi, 2015; Aletaibi, 2016; Bersin, Leonard &Wang-Audia, 2017) were conducted to understand the adoption of human capital analytics in various organizations (state universities included) but none of them paid special attention to Zimbabwean state universities. This study sought to develop a predictive model for human capital analytics adoption by human resource professionals in Zimbabwean state universities.

1.4 Research Objectives

1.4.1 General Objective

1. To develop a predictive model for human capital analytics adoption in Zimbabwean state universities

1.4. 2 Specific Objectives

1. To appraise the relationship between level of human capital analytics adoption and the time period since state universities introduced HRIS
2. To determine organisational dimension factors inhibiting the adoption of human capital analytics in state universities.
3. To assess human dimension factors impeding the full adoption of human capital analytics in state universities.
4. To develop a predictive model for adoption of human capital analytics in Zimbabwean state universities.

1.5 Research Questions

1. What is the the relationship between level of human capital analytics adoption and the time period since state universities introduced HRIS?
2. Which organisational dimension factors inhibit the adoption of human capital analytics in state universities?
3. Which human dimension factors impede the full adoption of human capital analytics in state universities?
4. Is there a predictive model for adoption of human capital analytics in Zimbabwean state universities?

1.6 Research Hypotheses

H_1:Length of time using HRIS affect level of adoption of human capital analytics in the organization

H_2: There is a significant relationship between organisational dimension factors and the level of adoption of human capital analytics in state universities

H_3: There is a significant relationship between human dimension factors and level of human capital analytics adoption in state universities

H_4:There is a predictive model for adoption of human capital analytics in Zimbabwean state universities

1.7 Significance of the study

First, the study will contribute to the discourse on human capital analytics in tertiary institutions in Zimbabwe particularly.The findings of previous studies (Bersin, Leonard &Wang-Audia, 2017; Aletaibi, 2016; Ojokuku & Akanbi, 2015; Molefe, 2013) did not adequately explain the phenomenon, time bound gaps, population gaps and geographical gaps have been identified in the previous researches. In the current study, the researcher intends to close the identified gaps. The research significantly contributes to the methodology for future studies in human capital analytics and to making its academic findings of value to practice. Second, the study informed university and government policy makers and practitioners as they develop policies, guidelines, systems and interventions pertaining to data-driven human resource management in tertiary institutions. Third, the study was significant in that it would expand the frontiers of knowledge by identifying factors that affect human capital analytics in state universities. The identification of such factors would go a long way in providing answers to questions like why human resource management has remained poor in local universities despite the fact that the institutions are being run by highly qualified personnel who have embraced strategic human resources management practices. Fourth, the research candidate anticipated to acquire the critical skills vital for solving societal problems and for pursuing post doctoral scholarship. Last, upon successful completion of the research study the researcher would earn the Doctor of Philosophy in Entrepreneurship and Business Management.

1.8 Scope of the study

The researcher, in order to control the scope of the study, set some boundaries (Leedy & Ormrod, 2010; Simon, 2011). The research study focused on areas under the jurisdiction of public higher education institutions.The researcher was therefore keen to find out the underlying challenges bedevilling human capital analytics adoption in local universities in spite of them being in the hands of highly qualified people. The study was conducted using the quantitative research strategy. A study of the adoption factors influencing human capital analytics among human resource professionals in Zimbabwean state universities is as a result of researcher's identification of a gap in literature and practice.Furthermore, and the need to come up with a predictive model for human capital analytics propelled the researcher to undertake this study. The study proposed a conceptual link between human and organization dimension factors and the nexus between level of human capital analytics adoption and the time period since state universities introduced HRIS as the independent variables and level of human capital analytics adoption as the dependent variable. For the purpose of this research, research subjects were human resource professionals, senior management and other employees in sampled Zimbabwean state universities. Data was collected from bonafide permanently employed workers from the host organizations, leaving out all other workers on part time contracts and industrial attachment. Mainly, the thesis was anchored on the Resource-based view theory supported by technology acceptance model (TAM), Kotter change management and Diffusion of Innovation theories. The study covered a period from 2019 to 2023. Overall, the researcher needed a minimum of twelve months to do the field work as well as to gain trust of the research subjects so as to obtain full details.

1.9 Overview of the method of investigation

This section discusses the research methodology adopted in the study. Specifically, it addresses the issues of research philosophy, approach, the research design, target population, sample size, sampling method, data collection techniques and the data analysis procedures adopted in the research. The thesis was guided by the positivism philosophy and adopted a deductive approach. The treatise also used the explanatory correlational research design, target population of the research was drawn from the human resource professionals, senior management and other employees who use human resource services from the fourteen Zimbabwean state universities.

A sample size of 434 research subjects was used for this study. Stratified random sampling and snowball methods were employed, structured questionnaire, key informant interviews and document review were the main data collection tools used. Data analysis was done using the statistical package for the social sciences (SPSS), Microsoft Excel and Jeffrey's Amazing Statistical Program (JASP). More detailed explanations of these issues are provided in chapter 3 of this thesis.

1.10 Organization of the study

Essentially, this subheading provides a representation of the whole thesis in terms of how the study was organized and sequenced (Bryman and Bell, 2015).The thesis was separated into five sections and elaborated as follows:

1.10.1 Chapter 1: Introduction

This is an introductory chapter that comprised of the background to the study, statement of the problem, research objectives, hypotheses, justification of the study, scope of the study, overview of the method of investigation and structure of the thesis. Chapter one also covered definition of key terms.

1.10.2 Chapter 2: Literature Review

This second chapter of the thesis started off by defining literature review and information sources for the literature review conducted. Conceptualization of the study key aspects was done and this also covered historical developments of the subject matter. Furthermore, a discussion of related literature on human capital analytics in higher education institutions around the world, in the African continent and in Zimbabwe was covered. The theoretical and conceptual frameworks guiding the study, empirical literature review and research gaps were covered.

1.10.3 Chapter 3: Research Methodology

This section of the thesis provided a detailed description of the research philosophy, research design, target population, sample size, sampling method, research instruments, data collection procedures, data analysis and presentation methods, reliability, validity and ethical considerations. Due diligence processes carried out by the researcher in this study was covered in this chapter as well.

1.10.4 Chapter 4: Results and Discussion

The chapter focused on data analysis and findings from the three research instruments used in this study. Reliability of the research of the data collection tools, identification and validation of the model was demonstrated in this chapter as well. Lastly, a discussion of the research findings as linked to empirical literature view discussed in chapter two and interpretation of the findings was covered.

1.10.5 Chapter 5: Conclusion and Implications

This phase of the treatise provides the conclusion based on the research objectives as outlined in Chapter 1. It also touched on the implications of the theory, implications for policy and practice and implications of the research methodology. The conceptual model developed from confirmed results was also covered in this chapter.

1.11 Chapter summary

This chapter discussed the background to the problem. In this case, the background provided an insight into the problem which prompted the study, statement of the problem, research objectives and hypotheses. Further, it covered significance of the study, scope of the study, overview of methods of investigation and organization of the study. It has been observed that human resource analytics is a vital aspect of every organization. In contemporary research and practice, human capital analytics takes a variety of different labels and forms, showing that the subject matter is still under intense development. Some of the other labels are talent analytics, workforce analytics, people analytics, human capital analytics and human resource analytics.The researcher in this thesis adopted the label human capital analytics. Human capital analytics usage is currently mostly limited to standard HR accounting and reporting, it is a relatively novel intervention in the larger domain of human resource management. Both anecdotal and empirical evidence pointed to the fact that there is a problem of under-utilization of human capital analytics in Zimbabwean state universities. The next chapter focused on a review of related literature pertaining to the subject matter.

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Introduction

The chapter discussed various human capital analytics literature at the international, regional, and local levels. The primary purpose of a literature review is to look into what others have done in similar areas, but not necessarily identical, to one's field of study (Mouton, 2001,p.87). This is done to gain an understanding of what, how, and where studies in the area are taking place. Google.scholar.com, newspaper articles, and the internet search engine for published academic work were used to find literature. A literature review is an essential component of any study, and the term "review" in this context refers to the evolution of human capital analytics, characteristics, models, value creation, and adoption challenges in organizations. The second section elaborated on theoretical aspects and their relevance to current research, conceptual framework, empirical evidence literature, and research gaps. The researcher used the 5Cs of writing a literature review: citing, comparing, contrasting, critiquing, and connecting the literature to own study (Callahan, 2014).

2.2 Evolution of HRA

Analytics is a knowledge domain that has developed at the junction of engineering, computer science, management, and quantitative methods to organize, analyze and make sense of the increasing amounts of data being generated by contemporary societies (Boudreau & Lawler, 2015a). Analytics has been described as a 'must have' capability for the HR profession; a tool for creating value from people and a pathway to broadening the strategic influence of the HR function (CIPD, 2013). In a seminal work on HR metrics, Fitz-enz (1984) worked with Saratoga Institute to create HR metrics that could determine the value and effectiveness. The seminal work was about of HR initiatives in areas such as turnover, training, return on human capital, costs of labor, and expenses per employee. HR metrics evolved and attained some level of standardization enabling organizations to use them as benchmarks of efficiency, effectiveness, and impact that resulted in competitive advantages (Handa & Garima, 2014).

The disadvantage of using metrics as benchmarks was the belief that all organizations are similar, and the same solution would work for all companies regardless of the organizational context.

While HR managers may find HR metrics convenient to measure the effectiveness of HR initiatives, the challenges with metrics are that they are of limited strategic value. Precisely, the basis of metrics is past data, the method of calculation uses non-standard idiosyncratic computations, and they are usually not business-focused (Harris, Craig, & Light, 2011; Nienaber & Sewdass, 2016). In the same vein of argument, Heuvel and Bondarouk (2017) remarked that metrics alone are not adequate as they do not provide insights into causal factors, do not explain differences in outcomes, nor can they predict the likelihood of future recurrences. HR metrics alone could not provide the answers asked by business leaders regarding the value of HR to the company's performance. However, as noted by Nienaber and Sewdass (2016), measurement of the impact of people initiatives on organizational performance is a necessity for promoting competitive advantage and facilitating business performance. During the 1990s, HR thought leaders intensified efforts to manage and measure the returns on investment in people. Such efforts resulted in a shift to viewing people as valuable organizational resources with the capability to create a competitive advantage (Barney,1991; Huselid,1995). Research on high-performance work systems by Huselid (1995) established the relationship between HR management systems and organizational performance. Another significant development in the field of measuring HR effectiveness, compared to efficiency, is Kaplan and Norton's (1996) balanced scorecard that focused on indicators of HR effectiveness from critical organizational perspectives.Relentlessly, HR scholars and practitioners continued to seek improved methods for measuring the effect of HR activity on organizational performance. By the mid-2000s, the practice of using scientific methods to evaluate management practices emerged as evidenced-based management (Madsen & Slatten, 2017). This practice caused an increased demand for more scientific and evidence-based methodologies for HR management (Boudreau & Ramstad, 2007; Madsen & Slatten, 2017). Reddy and Lakshmikeerthi (2017) defined evidenced-based management as using scientific evidence as the basis for managerial decisions.

Equally, Rousseau and Barends (2011) described evidence-based management as using the best evidence from multiple sources for the process of appraising decisions and then evaluating the results of the decisions taken. Consequently, evidenced-based management results in improved organizational performance and extending the use of evidence-informed resolutions to HR facilitates success and a more engaged workforce (Reddy & Lakshmikeerthi, 2017).

Madsen and Slatten (2017) noted that evidence-based management trends and the ongoing quest for HR to become strategic were the foremost drivers of HRA gaining the status of being critical for competitive advantage. In contemporary competitive and knowledge-based environments, HR can no longer afford to base decisions on the manager's experience, intuition, or best practice, but must use more logical and scientific approaches to decision-making(Bersin *et al.*, 2014a).In resource-constrained environments, HR, as with any other resource, must provide evidence of a superior return on investment or risk losing support for investments in HR. Advancements in technology-enabled HR managers to maximize data for improved performance. Increase in IT capabilities, HR information systems (HRIS), and big data contributed to propelling the HRA drive (Dlomu & Spears, 2015; Du Plessis & De Wet Fourie, 2016; Schiemann *et al.*, 2017). Handa and Garima (2014) noted that technology provided automation, powerful HRIS, and various data collection systems resulting in extensive HR data. Advances in IT increased computing power and connectivity, enabling an organization to obtain, and process voluminous data quickly, and cheaper. Likewise, technology influences modern-day strategic planning, as more companies are making efforts to capture and manage people-related data through HR information systems (Du Plessis & De Wet Fourie, 2016; Lal, 2015). Furthermore, modern enterprise resource planning (ERP) systems enable the combination of HR data with operational and financial data. Eventually, these ERP systems create vast opportunities for companies to gain advanced insights about drivers of performance through HRA (Du Plessis & De Wet Fourie, 2016; Togt & Rasmussen, 2017). In sum, gathering and analyzing big data provides vital information HR managers can use to understand trends and uncover critical insights to shape HR policies and practices to drive the behaviors that result in profitable business results.

2.3 Characteristics of HRA

Scholars and practitioners have not yet agreed on a general definition for HRA. Researchers identified the lack of a simple paradigm as one of the barriers to the adoption of HRA (Narula, 2015; Fink, 2017; Reddy & Lakshmikeerthi, 2017). Levenson and Fink (2017) noted that because of limited standard HRA frameworks, the concept of HRA currently covers a wide range of numerical practices and processes related to HR work. Thought process of HRA cover a wide scope of activities including metrics, statistics and cover different perspectives. Fitz-enz and Mattox (2014) described HRA as a means of communication and concurred with Sesil (2014) that HRA is both art and science. From another angle, Narula (2015) defined HRA as an approach for combining data into metrics to examine relationships or changes to facilitate managerial decisions based on evidence. Handa and Garima (2014) suggested HRA is a process for reporting HR metrics, a measure of comparison, a predictive tool, a facilitator of performance, and a talent optimization solution. George and Kamalanabhan (2016) defined HRA as a process for providing evidence of the direct impact of HR-related activities on business outcomes. Marler and Boudreau (2017) explained HRA as an evidence-based decision-making approach for HR issues consisting of an array of tools and technologies and encompasses simple reporting of HR metrics up to predictive modeling. Paradoxically, some HR managers who use efficiency and effectiveness metrics claim to be using HRA. Others who use metrics to measure the impact of HR decisions may also argue they are using HRA. Some models of HRA specify reporting descriptive metrics as the beginning stage of HRA (Fitz-enz, 2010). Minbaeva (2017) conceptualized HRA as organizational capacity in three categories that should exist at three levels: individual, process, and corporate, and requiring three elements: data quality, analytical competencies, and strategic determination.

Another issue with the definitions of HRA arises from the different terms used to describe the process. Interestingly, the common phrases are HRA, workforce analytics, human capital analytics, and people analytics, which people use interchangeably. Van den Heuvel and Bondarouk (2017) suggested that the different terminology of HRA may relate to the same processes. In essence, the difference in semantics relates to expected outcomes and determinants of the success of HR/workforce/people analytics.

Adding to the controversy, some scholars suggested HRA is merely a fad or a non-rational trend that may not have a lasting impact as a management technique (Angrave *et al.*, 2016; Rasmussen & Ulrich, 2015). Certain similarities exist in the various definitions of HRA. Various definitions from different scholars point to the measurement aspect in all human endeavours in organisations to enable data driven decisions. Despite the confusion and integration of HR metrics into definitions of HRA, they are not the same.

Importantly, Fitz-enz (2009) proposed that HRA starts with simple metrics, but users must link the data from HR metrics with data from other sources to enable the predictions and insights that propel business outcomes. Supporting Fitz-enz, Sant (2016) posited that HRA transforms HR data and measures (HR metrics) by using statistics and research from other functional areas to provide accurate and relevant insights on business performance. Fitz-enz and Mattox (2014) defined HRA as a process for combining disparate data from sources such as surveys and operations records to develop a cohesive and actionable picture of current conditions and future outcomes. Heuvel and Bondarouk (2017) noted that HR metrics are essential and permit an examination of HR data from different perspectives.

However, HRA links HR data with other data and business outcomes; therefore, users should not use HR metrics and HRA interchangeably. Marler and Boudreau (2017) noted that HRA enables managers to make superior results compared to HR metrics by connecting HR practices with organizational performance. Sesil (2014) suggested through HR metrics, HR managers started developing measures of relationships between critical variables and HRA can deepen that understanding to improve decision-making. Considering that HR managers use standard HR metrics to report HR data, these simple HR metrics and reporting should form the foundation of HRA while HRA is the process of integrating these metrics with data from other sources. Managers use information from HRA to solve business performance issues; this distinguishes HRA from HR metrics and justifies investments in HRA. By enabling managers to provide evidence of the factors that facilitate or hinder business results, HRA is a powerful tool to compel actions to improve organizational performance.

The foregoing paragraphs reflect the challenges resulting from the lack of a standard definition and framework for HRA. This state of affairs emphasizes the need for scholarly research in this area and developing standards for HRA.

2.4 HRA Classification and Models

Despite the inconsistency of HRA definitions, scholars and practitioners have developed standard classifications of HRA. Interestingly, scholars and practitioners classify analytics into three levels; descriptive, predictive, and prescriptive (Fitz-enz, 2010; Kapoor & Kabra, 2014; Narula, 2015; Sant, 2016; Talukdar, 2016). Descriptive analytics is usually the starting point to provide an understanding of past and current performance to answer questions regarding what happened. Examples of descriptive analytics include employee attrition rate by job function or location, grade, or other similar demographics. Predictive analytics involves using advanced statistical methods to analyze data on past trends and relationships to predict the future. Leaders may use predictive analytics to identify employees likely to quit their job or in recruiting to predict which candidates will best fit the position. Prescriptive analytics enable modeling and forecasting for the optimization of outcomes by identifying probable future results in terms of probabilities. Prescriptive analytics allow managers to minimize risks and maximize return on investments. With predictive analytics, managers can determine which actions would reduce attrition or build success models to identify the best people to recruit, train, and promote.

2.4.1 HRA models

Just as there is an array of definitions of HRA, there is also no standard approach to HRA. Scholars identified the lack of a simple HRA paradigm that informs how HRA improves business performance as a significant barrier to HRA adoption (Lesser & Hoffman, 2012; Handa & Garima, 2014; Angrave *et al*.,2016; Reddy & Lakshmikeerthi, 2017; Sharma & Bhatnagar, 2017). The lack of empirical research on HRA further compounds this problem and only a few companies that have successfully implemented analytics have shared their experience of building the analytics function (Togt & Rasmussen, 2017). Analytics are strategic tools business leaders apply to solve complex problems or to exploit opportunities.

However, unlike strategic planning with standardized models established by research, there is a gap regarding empirical literature on HRA models. This section examined some of the established models, as well as practitioner recommended approaches for successful HRA.

2.4.2 Human capital bridge framework

The HC Bridge Framework was one of the first HRA models developed to address the limitations of HR metrics (Boudreau&Ramstad, 2002). The model theorized that the critical feature of any HR measurement method was the ability to enhance management decisions by establishing a logical connection between HR actions and business results. Boudreau and Ramstad used the metaphor of a bridge to represent the links between HR investments and business performance. The framework considered measures beyond HR activity and focused on what the company should be accomplished through its people. The focus of the model is three anchor points relevant to virtually all business decisions; efficiency, effectiveness, and impact. Scholars discovered the HC Bridge Framework as useful for linking HR processes with business strategy to leverage financial performance and demonstrate the value HR adds to the business (Magau & Roodt, 2010; Talukdar, 2016).

2.4.3 LAMP model

Building on the HC bridge model feedback, in 2004 Boudreau and Ramstad introduced the LAMP model for measuring the outcome of HR actions (Boudreau & Ramstad, 2004). The authors noted that HR managers had developed standard and useful measures of HR efficiency and effectiveness, which were limited in their ability to measure the actual effects of HR initiatives to truly enhance people-related decisions. Boudreau and Ramstad developed the LAMP model to enable managers to identify the decisions about people most crucial for organizational success and how to link those decisions logically to organizations' effectiveness. The letters in LAMP stand for the four critical components of a measurement system that can cause organizational efficiency; logic, analytics, measures, and process. Boudreau and Ramstad (2004) posited that these four components logically identifies the questions that reveal associations between HR investment and corporate performance.

Analytics is defined as identifying, articulating, and analyzing data on critical issues from HR and other relevant areas to provide insights into essential logic questions(ibid). Appropriate and accurate measures are required as indicators of progress on programs and results. The process reflects the goal of the measurement system, effectiveness, and strategic success. Thus, the process elements should reflect the change management efforts reflecting the knowledge and learning from the earlier steps. Marler and Boudreau (2017) suggested these four factors were necessary to provide evidence of the causal relationships between HR programs, strategic HR management, and business outcomes and thereby improving decisions.

2.4.4 Human capital capability scorecard

The human capital capability scorecard (HCCS) is another HRA model. Bassi and McMurrer (2008) developed the HCCS as a model through which organizations can link critical human capital activities to the outcomes that drive financial performance. Based on research, Bassi and McMurrer (2008) identified the following HR management drivers that affect organizational performance: leadership practices, employee engagement, knowledge accessibility, workforce optimization, and learning capacity. The framework assesses a company's level of HR management maturity in these critical areas and then links the variations to key organizational outcomes. Business leaders operationalize the HCCS through employee surveys that capture essential HR metrics and data to predict future business results. Bassi and McMurrer also suggested that the process enables the development of disaggregated measures of the quality of HR management in the company, creating an opportunity to focus on areas for improvement. Therefore, the HCCS is useful for analyzing the effect of HR actions on organizational performance. Based on Bassi and McMurrer's HCCS, scholars conducted studies to establish the impact of the proposed HR-related drivers of organizational performance and confirmed significant positive relationships (Odhong, Were, & Omolo, 2014; Salau, Falola, Ibidunni, & Igbinoba, 2016). Bassi and McMurrer's HCCS was a significant development as it provided evidence linking HR management practices to business performance. Consequently, this creates an avenue for companies to improve their results by realizing and focusing on the unique capabilities of their people as a source of competitive advantage.

However, managers using the HCCS cannot provide explanations for the perceived relationships between the HR management drivers and performance. Another limitation is HCCS only uses HR information without considering environmental factors that could have a possible influence on HR and performance.

2.4.5 Human capital management for the 21st-century model

Human capital management for the 21st century (HCM:21) was one of the first comprehensive HRA models. Fitz-enz (2007) introduced the HCM:21 model; a framework for analyzing data at an organizational level allowing HR to focus on corporate-level strategic issues. The model was designed to support strategic planning by incorporating processes for market scanning to develop leading indicators and integrating different measurement systems to optimize HR services. The steps of the model are (a) the strategic scan, (b) capability planning, (c) process optimization, (d) integrated delivery, (e) predictive measurement, and (f) analytics (Fitz-enz, 2010). The model is analytical as it uses data from various sources to integrate three levels of assessment; strategic, HR operations, and leading indicators to instigate change and predict future outcomes. One advantage of the HCM:21 model was the inclusion of leading indicators and consideration of the intangible factors that influence company performance. Essentially, the intangible factors are leadership and employee engagement, and allow a more holistic analysis. Some scholars described the HCM:21 model as one of the most comprehensive logic frameworks for conducting HRA (Zafor & Shaobo, 2013;Muscalu & Şerban, 2014). The HCM:21 enables managers to gather, organize, and interpret data from various sources for predictions in support of a broad range of business goals as well as specific HR initiatives. Spahic (2015) suggested that the HCM:21 model is complex and presents a challenge as it requires users to adapt to, and practice, evidence-based HR while developing the measures of HR investments. Jensen-Eriksen (2016) noted the versatility of the HCM:21 model as it can be used for different situations and uses various tools and metrics suitable for the context. However, this versatility also presents a challenge as Jensen-Eriksen noted more complex tools require higher strategic and analytical capability from users. This need for versatility is significant because scholars identified the lack of skills of HR managers for using HRA as one of the primary factors preventing its adoption (Marler & Boudreau, 2017).

Fatima and Rahaman's (2014) study explored various data mining techniques and concluded C4.5 algorithms, K-nearest neighbor, and a priori algorithms were suitable for human talent prediction, workforce planning, and recruitment. Mishra and Lama (2016) developed a decision-making framework for HR decisions comprising data mining and predictive analytics. Mishra and Lama suggested decision trees, logistic regression, and neural networks are the data mining techniques most suitable for understanding the problem of turnover while classification, clustering, association, and prediction rules are most appropriate for talent management. In their study, Hirsch, Sachs, and Toryfter (2015) described an HRA project using a multivariate regression model to conduct attrition rate analysis while Sharma and Berger (2017) developed a model for the same purpose but suggested the use of factor analysis or multiple regression analysis. In their research, Xiaojuan *et al*., (2017) used time series modeling for the same purpose.

From the literature reviewed, the actual statistical methods used in HRA to analyze data and provide the required insights depend on the nature of the question a user chooses to answer or the problem one is attempting to solve. Scholars posited that there is no standard HRA application that answers all questions (Schiemann *et al*., 2017; Sharma & Berger, 2017). HRA practitioners adopt a wide range of statistical techniques appropriate for the specific purpose. The wide variety of techniques and processes for the statistical analysis required to prove causal associations between HR actions and business outcomes is a challenge for an inexperienced person attempting to start the journey to HRA. From the review, it is observed that there is a gap in the literature on the most effectual methodology for guiding the use of analytics to deliver practical and usable information for management decisions. In this thesis, the researcher intended to develop a predictive model for the level of adoption of human capital analytics.

2.5 HRA Value Creation

Scholars suggested HRA could be used to strengthen strategy implementation (Sant, 2016; Levenson, 2017). Others suggest that the most important use of HRA is to enable the identification and understanding of the linkages between people and organizational outcomes (Aral, Brynjolfsson, & Wu, 2012; Sharma *et al*., 2014; Wawer & Muryjas, 2016).

Similarly, many business leaders identified business intelligence and analytics as their priority for improving competitiveness(Holsapple, Lee-Post, & Pakath, 2014; Collins *et al*., 2017). HRA enables managers to focus on improving business performance instead of simply HR management. HR leaders used to focus on establishing the efficiency, effectiveness, or impact of HR initiatives but such standards are no longer acceptable in today's knowledge and data-driven operational environment. Therefore, the objective of HRA should be to add value by solving business problems and creating a competitive advantage or business transformation (Turner & Zytkowiak, 2016; Fink, 2017; Levenson, 2017).

Strategic HR leaders must address the company's overarching business strategy and HRA is a powerful tool for optimizing HR to facilitate the achievement of business results. The use of HRA creates advantages for organizations in a few ways. Researchers indicated that HRA could improve a company's bottom line through effective workforce cost control and improve HR credibility (Kapoor & Kabra, 2014; Jones, 2015). Other benefits of using HRA include allowing segmentation of employees, talent pools, or vital skills for more efficient and impactful HR decisions (Muiruri *et al*., 2015). Arora and Rahman (2016) discovered that HR-related data are a component of 'big data' and are unique, valuable firm resources that can provide a sustainable competitive advantage. The HRA process facilitates insightful diagnosis of problems for developing focused solutions. HRA is a management tool for identifying opportunities, solving problems, and predicting returns on investments for obtaining maximum value (Fitz-enz & Mattox, 2014). Supporting the view that people are the most significant factor affecting business performance, scholars opined that HRA enables quantifying, evaluating, and controlling human behavior critical for improved workforce performance (Momin, 2015; Momin & Mishra, 2016; Nienaber & Sewdass, 2016). From another point of view, Fitz-enz and Mattox (2014) provided a simple analogy of the workings of HRA as a problem-solving process. If one collects detailed data regarding a problem (descriptive analytics) and analyzes it to determine causes of the problem and the effects of allowing the problem to continue (predictive analytics) then one could most likely develop a solution and prevent a recurrence of the problem (prescriptive analytics) (ibid).

The use of data in HRA ensures managers are making informed and unbiased decisions about the resource that has the most influence on company performance while the process of causal and statistical analysis increases the likelihood of choices achieving the intended results. The use of HRA enables detailed segmentation of employees, empowering HR managers to identify and understand the reasons behind the trends and thereby remove the guesswork from finding solutions. Scholars who support the resource-based theory, posit that HRA is associated with improvement in business performance and competitive advantage (McGuire & Ladd, 2014; Jones & Sturtevant, 2016; Marler & Boudreau, 2017).

Some researchers suggest the predictive quality and insights from HRA provide company leaders with the ability to identify challenges and opportunities and react to them ahead of competitors (Sharma *et al*., 2014; Kapoor & Kabra, 2014; ; Lakshmi & Pratap, 2016; Kryscynski *et al*., 2018). Another dimension of HRA's value relates to the improved quality of data supported decisions that are faster and less subjective. A statistical approach to decisions permits business leaders to establish correlations among variables and reach more objective decisions (Higgins, 2014; Lipkin, 2015; Mishra & Lama, 2016). HRA supports HR's strategic focus by providing means for HR managers to articulate the impact of HR initiatives on the company's profits in financial terms and using visualization to create a compelling story (Higgins, 2014; Fenzig, 2015; Lal, 2015).

Extant literature contained numerous examples of how companies used HRA to their advantage. The sphere of application of HRA is still limited. In their 2017 human capital management survey for Deloitte, Collins *et al*. (2017) noted that the use of HRA is expanding to cover a wide range of business challenges; however, recruiting remains the primary area of utilization. The other business facets are performance measurement, compensation, workforce planning, and retention. Despite the promise of HRA and the benefits identified in the literature, the uptake of HRA remains low and mainly focused on descriptive analytics (Dlomu & Spears, 2015; Lipkin, 2015; Pape, 2016; Wawer & Muryjas, 2016;Marler & Boudreau, 2017; Collins *et al*., 2017; Green, 2017).

2.6 Barriers to HRA Adoption

The development of HR analytics is being hampered by a lack of understanding of analytical thinking by the HR profession. This problem is compounded by the HR analytics industry, which is largely based on products and services which too often fail to provide the tools for HR to create and capture the strategic value of HR data. In practical terms, analytics involves both traditional relational database and spreadsheet-based analysis, new forms of database software that allow very large quantities of data to be stored and organized more efficiently. More specifically, data held in HRIS typically comprises information on the workers who are hired (employment history, skills, competencies, formal educational qualifications, demographic information) and on those applicants that were not hired. Once a worker is employed by an organisation, data on hours worked and pay is collected and stored routinely. Depending on the job role, there may also be information on the performance of workers (sales made, hours billed to clients, and measures of individual output). Additionally, there are a variety of 'soft' performance data that might be collected from appraisal and performance management systems, along with information on training and development that the worker has experienced. This would also include information on grievances, capability and disciplinary cases, dispute resolution, internal communications, participation schemes, and staff attitudes surveys. Historically, such data have been held in separate pieces of software designed to carry out different HR processes (Parry, 2011), but increasingly they are being gathered together and held in cloud-based data warehouses as organizations invest in upgrading HRIS.

Conceivably, these data could be combined with 'bigger' data on what a worker does, whom they communicate with and what they communicate about. There are also significant issues of privacy, consent, and ethics to address when storing and analyzing HR data. Nevertheless, while the technology to more fully exploit big data as it relates to HR develops there is still much that can be done with existing relational data held on HRIS. Indeed, making better use of this data to create and capture value is a necessary prerequisite to the more advanced forms of big data analysis that are in development. Rasmussen and Ulrich (2015) cite two examples of sophisticated HR analytics projects, in an offshore drilling company, which have provided a significant boost to business performance.

In the first, HR analytics was used to establish a relationship between leadership quality and lower turnover levels, which resulted in higher levels of operator competence which in turn fed through to fewer accidents. In the second, analytics were used to demonstrate the significant benefits the business derived from the company's graduate training program; the program was doubled in size as a result. Sparrow and his colleagues cite the example of how Tesco applied the analytics tools developed to understand its customers and its workforce, and how Mcdonald's was able to identify how staff demographics, management behaviors, and employee attitudes interacted to optimize restaurant performance. The key questions are how can analytics be used to create, capture, leverage, and protect value from HR data (Sparrow *et al*., 2015). Successful strategic HR analytics projects appear to be few and far between. Although many organizations have begun to engage with HR data and analytics, most have not progressed beyond operational reporting. There is little evidence of the strategic use of HR analytics (Parry & Tyson, 2011;Rasmussen and Ulrich, 2015).The central problem is that in the main, the ideas about HR data and analytics have not penetrated the thinking of much of the HR profession. Many HR professionals are skeptical because they question whether people can be reduced to metrics. Where these ideas have penetrated HR thinking, there remains the problem of praxis, the solution to which is not well understood in HR circles. According to the Chartered Institute for Personnel and Development, the HR function lacks the skills, knowledge, and insight to ask the right questions about the HR data they have at their disposal (CIPD, 2013; Rasmussen & Ulrich, 2015).

A survey by Collins *et al*. (2017) revealed that few organizations are successfully using analytics and the response to HRA is still bleak. HRA is primarily used for enhanced reporting, still often spreadsheet-based (Jones, 2015). Some of the reasons provided in previous studies for the failure to use HRA include the lack of a simple archetype that informs the use of analytics and the lack of skills (Angrave *et al.*, 2016; King, 2016; Minbaeva, 2017; Reddy & Lakshmikeerthi, 2017). Collins *et al.* (2017) reported that while 71% of respondents rated analytics as an area of priority, only 8% believed they had usable data. Other reasons are costs, challenges of integrating information systems, and lack of executive management support (Kapoor & Kabra, 2014; Tonidandel, King, & Cortina, 2016).

Some researchers noted emerging ethical issues and a lack of an appropriate legal framework (Pape, 2016; White & Ariyachandra, 2016). Some researchers supported the view that organizational culture is one of the factors that encourage or hinder HRA (Ames, 2014; Kapoor & Kabra, 2014; Tableau, 2016; Levenson, 2017; Sharma & Sharma, 2017).

Reliable data are fundamental to the successful implementation of any HRA project since the focus of HRA is to incorporate data from diverse sources to create astute comprehension of topics and enable enhanced solutions. If data are incomplete or defective, the process cannot deliver the desired results. Scholars revealed that data quality is critical as the use of any analysis depends on the quality of the data (Fenzig, 2015; Andersen, 2017) and referred to the famous adage; garbage in, garbage out. Even with clean data, without the skills to analyze and transform the data into knowledge, information, trends, or correlations; the data remains of limited value. Without the necessary analytical skills, HR managers are not likely to take advantage of the analytical capabilities offered by most modern HR management software (Jones, 2015). Togt and Rasmussen (2017) suggested companies that already have robust management information systems are deriving value from fact-based decisions but estimated the return on investment at only 80% without advanced analytics. For firms to maximize their big data analytical and HR system investments, HR professionals need to have relevant skills to use the software optimally and analyze the information astutely. HRA assists business leaders utilize the data they have more effectively. Big data are a facilitator of analytics as most companies now use HR management information technology that generates voluminous data (Lal, 2015). However, for HRA to be successful, the manager must identify the relevant data required to provide insight into the pertinent questions or business problems. The data must also be in a form that allows the integration of disparate datasets to provide a comprehensive and balanced representation of the issues. Outdated or flawed data can cost the organization the time needed to structure and clean the data to make them usable and increases risks. Minbaeva (2017) noted the requirement for successful HRA should not be big data but smart data; defined as methodical, structured data that is updated continuously. HR managers require a diverse set of skills to be successfully implementing HRA.

Kryscynski *et al*. (2018) opined that successful HR analysts must have strong analytical skills to produce recommendations supported by empirical evidence. Kryscynski *et al.* defined required analytical ability as the individual's ability to develop and test causal models using appropriate metrics and incorporating the results into the company's decision-making process.

Scholars opined that to work with HRA successfully, HR professionals require business acumen, business statistics, data modeling and interpretation, working knowledge of analytic tools and technology, as well as HR domain expertise (Andersen, 2017; Marler & Boudreau, 2017). Other researchers noted the importance of data visualization and storytelling skills needed to induce changes and action (Jones, 2015; Rasmussen & Ulrich, 2015; Boudreau & Cascio, 2017). Kapoor and Kabra (2014) suggested the ability to use HRA to confirm how HR is facilitating improved financial results is a distinguishing factor between high and low-performing companies. Analytical skills will become even more essential for HR professionals with technological advances and knowledge-based economies. Skills and data are critical to HRA leading, Sharma and Bhatnagar (2017) refer to them as the two most important influences promoting the use of analytics for strategic HR outcomes for enhanced business performance. Further, successful HRA requires a complement of both clean qualitative and relevant data and analytics skills. HR professionals need to up-skill themselves in this area or run the risk of statisticians and IT professionals taking over what should be a critical strategic HR role (Marler & Boudreau, 2017). For successful HRA, scholars noted the need for HR managers to be mindful of the operational context (Beygelman, 2014; Jones & Sturtevant, 2016; Minbaeva, 2017).

The literature above revealed a theme indicating that HRA is context specific. In analyzing data, HR managers require a clear understanding of the business, operational environment, and other contextual factors as these have a bearing on data interpretation results. Jones (2015) noted various locations might have different restrictions or requirements regarding data collection and use while Lal (2015) emphasized the need for understanding the contextual and complex relationships in the company. Another common theme in the literature is the influence of organizational culture on HRA.

2.7 Theoretical Framework

This section provided the theoretical framework which guided the thesis. A theoretical framework is a conceptual model of how one theorizes or makes logical sense of the relationships among the several factors that have been identified as important to the problem (Sekaran, 2003). The study was anchored on the Resource-based view as the main theory supported by Technology Acceptance Model (TAM), Kotter's change management and Diffusion of Innovation Theories. This treatise, acknowledged *a priori* the existence of Technology, Organization and Environment (TOE) as a model that is rival to the one (Resource-based view theory) tested.

2. 8 Resource-Based View Theory (RBV)

The resource-based view model of the firm was posited by Penrose (1959) and then Winerfelt (1984) as a theory of the firm. The core idea of the theory is that instead of looking at the competitive business environment to get a niche in the market or an edge over competition and threats, the organization should instead look within at the resources and potential it already has available.

According to RBV, it is significantly easier to exploit new opportunities using resources and competencies that are already available, rather than having to acquire new skills, traits, or functions for each different opportunity. These resources are the main focus of the RBV model, with its supporters arguing that these should be prioritized within organizational strategy development. It was then popularized through the works of Barney (1991), Peteraf (1993), Barney *et al*, (1995), and Teece (1997). Within an RBV model, there are two main types of resources (assets), which will likely be familiar to business professionals. Tangible assets are physical things, for example, property, land, products, and capital. These are resources that can generally be bought easily on the market and thus offer little competitive advantage, as other organizations can also acquire identical assets quickly if they should like.

Intangible assets refer to items and concepts that have no physical value but can still claim to be owned by the organization. This may refer to any reputation, trademarks, or intellectual property that the organization may possess. Some of these, for example, reputation are built up over a significant period and is something that other competitors or comparable organizations cannot buy on the market. These will likely stay within the organization and are their main source of competitive advantage.

There have been numerous publications in support of the RBV theory (Ranjan & Basak, 2013; Vargas,2015; Godwin-Opara,2016; Mbarki,2017) or making a critique (Gustavsson & Johansson, 2016; Lee and Kramer, 2016; Mupemhi, 2016). The theory tries to explain the role of the firm's internal resources in generating competitive advantages. It explains why businesses in the same industry and environment might have different competitive advantages and performance levels. The RBV theory argues that firms possess resources and capabilities which enable them to achieve a competitive advantage.

These then become the primary source of profit for the firm (Grant, 1991). In this theory, a resource is defined as an asset that is tied semi-permanently to the firm and includes financial, marketing, technological, and human resources assets (Barney, 1991). Resources are the inputs that help the daily operation of the organization (Amit & Schoemaker, 2012). Stacey (2011) advanced the use of the framework by stating that financial resources enable organizations to acquire other resources. According to RBV, businesses achieve sustainable competitive advantage when they effectively manage the resources owned or obtained (Barney & Hesterly, 2012).

i. Financial resources and the resource-based view

The financial resource is an assets used to settle liabilities and an obvious resource that companies must have available to achieve strategies (Stacey, 2011). The resource-based theory complements strategic human capital management by focusing company efforts on asset accumulation (Degravel, 2012). In a dynamic business environment, companies create a competitive advantage by offering value to customers that competitors cannot duplicate (Barney & Hesterly, 2012). The resource-based theory states that companies create value by manipulating resources for customers to appreciate the company's offerings (Henard & McFadyen, 2012). Henard and McFadyen noted that under the resource-based theory, the possession, utilization, and dedication of resources are strategically essential to value creation. The dedication helps companies exploit opportunities that exist in the marketplace (Henard & McFadyen, 2012) and affects companies' competitive advantage (Cassia & Minola, 2012). Stacey noted that financial resources enable organizations to acquire other forms of resources that organizations use for operations that justify the company's existence.

ii. Marketing resources and the resource-based view

The financial success of a business organization depends on the ability to market its products or services to make profits that sustain the growth of the organization (Kotler & Keller, 2012). Marketing plays a role in business survival in the face of a competitive economic environment. Marketing helps businesses in the building, maintain, and enhance their relationship with customers (Chang & Li, 2012).

Good marketing is a result of planning and execution requiring creative tools and techniques (Kotler & Keller, 2012). The RBV of marketing strategy helps to determine the resources relating to brand, relationship, and sales to help understand what drives competitive advantage (Kozlenkova *et al*., 2013). Business owners realized that corporate branding depends on employees effectively delivering the company's core value to the customers (Punjaisri & Wilson, 2010).

iii. Information technology and the resource-based view

According to RBV, companies' competitive advantage is attributed to their resources (Barney & Hesterly, 2012). Technological resource is an element in the success of businesses, and they must adapt to the latest technology to capture the required information about their customers (Yallapragada & Bhuiyan, 2011). Information is the lifeline of organizations so gathering information continuously and providing them to internal and external stakeholders help in making accurate decisions(ibid). Businesses that use the latest technology can capture and retain information about their customers better than their competitors retain. Uwizeyemungu and Raymond (2012) remarked that technological information resources contribute to organizational performance and add business value. In addition, Uwizeyemungu and Raymond argued a firm's strategic success depends on a combination of the firm technological resources that the company possesses internally. Achieving competitive advantage lies not only in the information infrastructure but also in the information organization and capabilities. Achieving competitive advantage through information technology depends on the specific capabilities the business chooses to develop (Uwizeyemungu & Raymond, 2012). Chia-An and Chandra (2012) noted that businesses knowledgeable in information technology are at an advantage because the resource helps the business operate efficiently.

iv. Human resources and the resource-based view

There is evidence that HR strategies help organizations achieve competitive advantage (Barney & Hesterly, 2012) and enhance organizational performance (Katou, 2012). The accumulation of high quality human capital can lead to a sustained competitive advantage when the resource is scarce, specialized, and holds tacit knowledge that makes it difficult to replicate by competitors (Shaw, Park & Kim, 2013). Human capital (HC) includes training, experience, judgment, intelligence, relationships, and insight of individual staff and managers. RBV reaffirms strategic HR management scholars' view that people, as an internal resource, are a source of competitive advantage (ibid). Maley (2014) observed that traditionally in the field of management, there is a recognition that HR contributed to business effectiveness and is identified as a valuable source of competitive advantage. Angadwita and Mustafid (2014) noted that besides innovativeness, sustainability, and entrepreneurial aspects, business organizations need the competence of HR to face market competition.

Businesses with a workforce that possesses superior knowledge, skills, and capabilities achieve a competitive advantage because competitors cannot copy the model. Shammot (2013) noted that the services rendered by employees were the differentiator that determines competitive advantage and suggested that competent employees are great assets to businesses. While Ahmad and Achim (2013) viewed the employees as an asset rather than just labor cost. Human resources are a vital asset that plays a vital role in organizational performance and value creation (Cherian & Farouq, 2013). A firm's human resources contribute to value creation through employee skills, commitment, attitudes, and motivation making HR a source of competitive advantage. The firm's capability, on the other hand, is defined as the firm's capacity to deploy resources. Hence, the firm's resources are deployed as it implements strategies to achieve efficiency and effectiveness. Thus, a competitive advantage is gained if this deployment of resources leads to superior differentiation or lower costs by comparison with a marginal competitor in the product market (Stephane, 2007). If the firm's resources are to generate a sustainable competitive advantage (SCA), which by definition is a superior differentiation that cannot be duplicated by competitors, then the resources must be heterogeneously distributed across the industry and it should be difficult to move them from one firm (ibid).

Therefore, resource heterogeneity and immovability differentiate firms, thus generating a competitive advantage for those firms with a valuable resource and a competitive disadvantage for those without it. This means that firms cannot have a competitive advantage if strategic resources are evenly distributed and highly mobile across all competing firms.

The RBV literature identifies critical attributes of resources that generate competitive advantages. These are rareness, value, imitability, and substitutability (Coleman, Cotei & Farhat, 2013). The Rareness of the strategic resource implies the uniqueness of the resource which is inherent to a particular firm in the industry such that when it is deployed in executing a particular value-enhancing strategy, the benefits accrued are unique to that firm (Barney, 1991). Therefore, rare resources are needed to generate a sustainable competitive advantage. The second attribute of the firm resource which generates a sustainable competitive advantage (SCA) is that it should be imperfectly imitable, that is, firms that do not have the resource cannot duplicate it (Barney, 1991). The RBV literature identifies three reasons why the resource might not be duplicated.

These are: (1) the unique historical conditions of the firm: some firm resources depend on time and space advantages such that firms which could not acquire the resource at the given time or place might not be able to do so anymore. (2) Causal ambiguity: this means making it difficult for firms that may want to duplicate the resource to know what actions to take to gain the SCA because there is no clear link between the resource and the SCA. (3) Social complexity: some resources may be difficult to imitate due to complex social relations, culture, or traditions involved. The third attribute is substitutability. The firm resources are not substitutable if there is no other strategically equivalent resource, that is, any other resource that can be exploited separately to achieve the same goal. The fourth attribute of the firm resource which generates a sustainable competitive advantage is value. A firm resource has value if it can be used to exploit opportunities and neutralize threats in the firm's environment.

v. Assumptions of RBV

There are two significant, critical assumptions of RBV, that resources must also be heterogeneous and immobile.

vi. **Heterogeneous**

This first major assumption is that resources, skills, and capabilities must vary significantly from one organization to another.

If these organizations had the same set of resources and individuals, they would not be able to employ varying strategies to compete with one another, as other organizations would be able to follow them step by step (known as "perfect competition"). Perfect competition does not exist in the real world, companies may be exposed to the same competitive and external forces, but they are still able to formulate different strategies to compete with one another. Thus, RBV assumes that this is due to the varying values of their resources and skills.

vii. **Immobile**

The second assumption of RBV is that resources are immobile and thus unable to move freely from organization to organization, for example, employee movement, at least over the short-term. Due to this, organizations are unable to quickly replicate the resources of rival organizations and therefore implement the same strategies. Intangible assets-knowledge, processes, and intellectual property are more likely to be 100% immobile than tangible assets.

viii. VRIO Framework

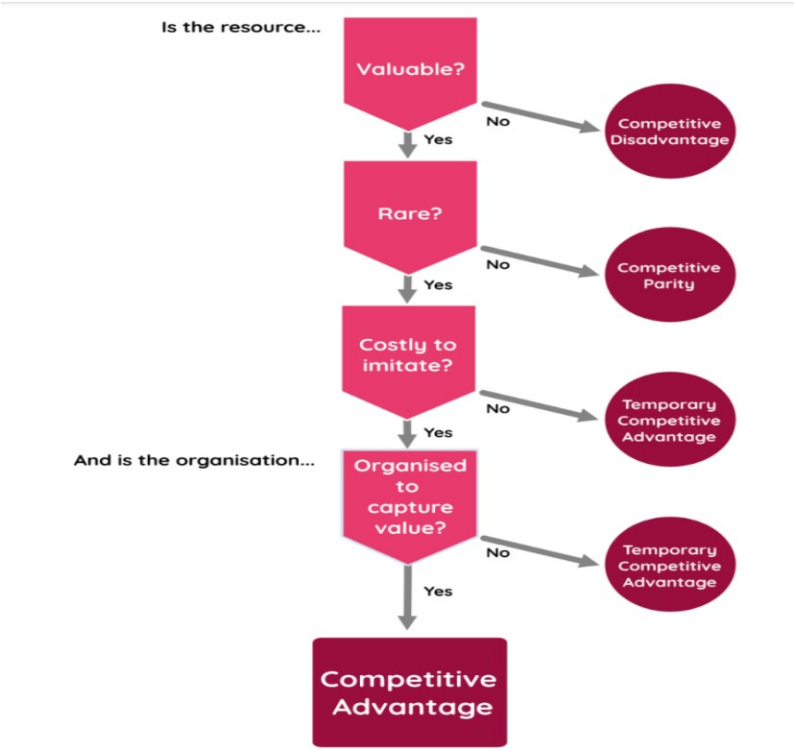


Figure 1:VRIO Flowchart.

Source: Adapted from Rothaermel, F. (2013). *Strategic Management*.

Although possession of heterogeneous and immobile resources is crucial to organizational success, it is not alone if an organization wishes to sustain this competitive advantage. Barney (1991) identified a framework for examining the key properties of resources and organizations (VRIN). These criteria were altered later by other leadership thinkers, and the new acronym VRIO was developed to stand for valuable, rare, low imitability, and organized to capture value.

ix. **Valuable**

Resources are valuable if they can help to increase the value of the service or product supplied to customers or others reliant on the organization. This can be improved by increasing differentiation, decreasing the cost of production, or other general modifications to improve the quality and worth of the service. Any resources that do not meet this condition may lead to a competitive disadvantage.

x. **Rare**

Any resources-both tangible or intangible-which can only be acquired by one or very few organizations, may be considered rare. If organizations have the same resources or capabilities, this can result in competitive parity.

xi. **Low Imitability**

If an organization holds resources that are valuable or rare, it can at least achieve a competitive advantage in the short-term. However, to sustain this advantage the resources need to be costly to imitate or substitute, or else rivals may begin to close the gap by obtaining the same or similar resources.

xii. **Organized to capture value**

Resources do not necessarily convey a competitive advantage if the organization, its systems, and its processes are not designed to exploit the resource to its fullest, then it cannot hope to gain a competitive advantage. This could refer to not utilizing talented or knowledgeable individuals in the correct department or role, or not fully building campaigns that utilize the organization's positive reputation, amongst many other examples. Only when all of these factors are fulfilled can one gain a sustained competitive advantage, and can innovate, and get ahead in the market.

2.8.1 Critique of the Resource-Based View Theory

The authors of RBV frameworks tell managers that they should find and develop high-potential resources, using the VRIO framework; however, they do not suggest how this should be done, and in reality, there is often nothing that managers appear able to do to improve the resources available. Further critiques include the extreme rarity of resources that match the VRIO criteria, the limit of the VRIO criteria itself in determining value, the unclear and indeterminate nature of VRIO itself, and the ambiguous nature of the term "resources". Supporters of RBV posit that competitive advantage is best achieved by utilizing present internal resources. However, this has drawn many critics within leadership and management, and frameworks such as the industrial organization view (I/O), place more emphasis on strategic planning, regulatory policy, and the activity of market competition. In reality, the likelihood is that significant amounts of an organization's performance can be explained by both factors.

What RBV neglect to mention, is that leaders and managers can improve the processes and systems that create higher-value resources which could over the long term have a more significant impact on the performance of the organization. In addition, when in unpredictable markets such as the technology industry, innovations, and new inventions can almost instantly have a drastic effect on the value of resources. This can render previous activities to try and generate a sustainable advantage null thus, RBV can be considered to be only a practical view when situated in a stable competitive environment. Eisenhardt and Martin (2000) indicated that levels of organizational learning and adaptiveness are more crucial to success over the long term, though RBV can be an important model in the short-term. The RBV theory generated a lot of debate with some scholars strongly arguing that it cannot be a theory of the firm. Some of the notable critiques are from Gustavsson and Johansson's (2016) research study in the United States of America. The resource-based theory was used on the challenges of formulating an expansion strategy in the real estate industry. However, the RBV has been accused of being too theoretical with practitioners finding it difficult to fully operationalize its concepts and making the RBV difficult to use in practice.

The major weakness of this theory was identified as its lack of unity of analysis as it focused on resources rather than activities as sources of competitive advantage. Porter (1985) identified the firm's activities as sources of competitive advantage. It then looks like this model is countering Porter's propositions but without offering a proper definition of the constructs of the theory (Foss & Knudsen, 2003). Furthermore, it ignores the constraints that the environment may impose on the firm desiring to generate a competitive advantage. For a long time, scholars in strategic management have known that competitive advantage depends on a match between the firm's internal strengths and environmental opportunities (Hart, 1995). The RBV's focus on internal factors only has generated debate. The other critique is that the theory views firms as a bundle of resources instead of a collection of people trying to make sense of what is happening around them (Weick, 2001; Stephane, 2007). Lee and Kramer (2016) emphasized the major limitation of the RBV is the internal focus, noting that the operational environment might constrain the delivery of value by internal resources.

The general concluding thought is that RBV can be useful for developing competitive advantage, particularly in the short-term, but should be considered in partnership with other frameworks and theories when performing long term strategic planning.

Despite these critiques, the RBV remains a useful model for explaining sustainable competitive advantage and performance in firms, hence it has continued to be applied in many empirical studies, including the areas of information systems (IS), e-business, and manufacturing (Ranjan & Basak,2013;Vargas, 2015; Godwin-Opara, 2016; Mbarki, 2017). Godwin-Opara's (2016) research study in the USA, South Central Kansas on Financial Resource Strategies for Small Business Sustainability among five machine shop owners used the resource-based view (RBV) theory. As applied to the Godwin-Opara study, the RBV provided the conceptual lens to understand how obtaining financial resources would contribute to business success. The application of the RBV helped let participants identify the strategies that were needed to obtain financing that could help achieve financial sustainability. The purpose of the Godwin-Opara (2016) multiple case study was to identify the strategies that some small business owners used to obtain the financial resources needed to operate a financially sustainable business and competitive advantage (Shafeey & Trott, 2014).

Small businesses achieve a competitive advantage when they create more value than their competitors, and the competitors cannot duplicate the strategy (Barney & Hesterly, 2012). If competitors find it difficult to imitate the resources, the small business generates a competitive advantage (ibid). Mbarki (2017) research study in Belgium used the resource-based view theory to analyze its application to operations strategy and how it would impact a manufacturing firm.

New insights and observations emerged on how the resource-based view can complement the operations strategy. The resource-based logic can also have important implications for management practice. Indeed, this logic can be employed by management teams who are facing strategic disadvantages and used to achieve a somewhat strategic balance by identifying those valuable and rare resources their firm currently does not own and analyzing if they could be duplicated either through imitation or substitution. Resource-based logic can also assist managers in firms that have the potential for achieving sustained competitive advantages, but cannot seem to fully realize this potential.

By helping managers to understand how resources can be fully utilized to generate sustained competitive advantages, the resource-based logic can be an amazing framework to assess the full range of a firm's resources and then exploit the most critical resources to finally achieve sustainable competitive advantages (Samaha & Palmatier, 2013). Finally, resource-based logic can also be used by managers to ensure that they nurture and maintain those resources that are sources of a firm's current competitive advantages. Competitive advantages for firms are often based on bundles of related resources. Some of these resources are likely to be valuable, but either not rare, not imperfectly imitable, or not non-substitutable. Armed with this understanding, managers in an organization may be less inclined to make decisions that have the effect of destroying the very resource that is generating a sustained competitive advantage for their firm (Barney & Arikan, 2001).

Ranjan and Basak's (2013) study findings regarding the limited availability of talent needed in HRA support the RBV theory. Ranjan and Basak(2013,p.3) stated that even with the relatively high unemployment rates in the weak economic scenario, the scarcity of skilled talent is a key concern for many organizations. Analytics is emerging as a handy weapon in this "talent war" to hire, retain, and effectively manage scarce talent.

Resourced-based theory (Barney, 1991) suggests that resources that are rare, inimitable, and non-substitutable provide sources of sustainable competitive advantage for the organization. If strategically managed, a firm's human resource deployments have the potential to meet these conditions and thus provide the firm with an advantage in terms of its human, social, and intellectual capital. Using HRA properly can predict which employees may be getting ready to leave the organization, which will assist in the retention process by either increasing compensation, and responsibilities, or even providing job rotation (Siegel, 2013).

2.8.2 Relevant Aspects from RBV for human capital analytics

The tangible and intangible resources and capabilities maybe a source of sustained competitive advantage if it is rare, valuable, imperfectly imitable, and not substitutable (Barney, 1991; Barney *et al*., 2001).

The absence of other researchers who used this theory at the local level in state universities, especially in studying the level of human capital analytics adoption combined with the strengths identified (Ranjan & Basak, 2013; Vargas, 2015; Godwin-Opara, 2016; Mbarki, 2017) in past researches made the RBV theory more applicable to this study on human capital analytics adoption. The theory provides a framework for understanding the importance of organizational resources and explains that the performance and sustainability of an organization depend on the resources owned and controlled by the organization. The other reason the RBV theory was chosen by this researcher is that it has been tested empirically and supported through validations, applications, and replications (Schaup *et.al*. 2010, Lee 2010). Resource-based view theory is one of the most powerful, robust, and parsimonious theories for predicting the level of adoption of human capital analytics which is the key subject of this study. The RBV model applies to any type of business sector or organization regardless of its constitution, orientation, components, or scope. In this way, more experiences are needed to study human capital analytics within public universities in Zimbabwe. Although there are different scholars with extensive intellectual and empirical production on the theory analyzed from different points of view, there is still great potential to develop it.

2.9 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed by Fred Davis in 1986 to predict user acceptance of new technologies (Takele&Sira, 2013). According to Chuttur (2009), Davis considered that the actual use of a system is behavior, and thus the Theory of Reasoned Action (TRA) would be a suitable model to explain and predict that behavior. He borrowed and used the principles of 'intention to use' to influence behavior (actual use) in TAM (Klopping&McKinney, 2004). However, Davis did not take the subjective norm in Figure 1 into account in influencing intention to use as he was uncertain of its theoretical status (Chuttur, 2009). Although he considered the attitude of a person towards influencing intention, he did not include Fishbein and Ajzen's main beliefs on the consequences of behavior and what others thought about a given behavior.

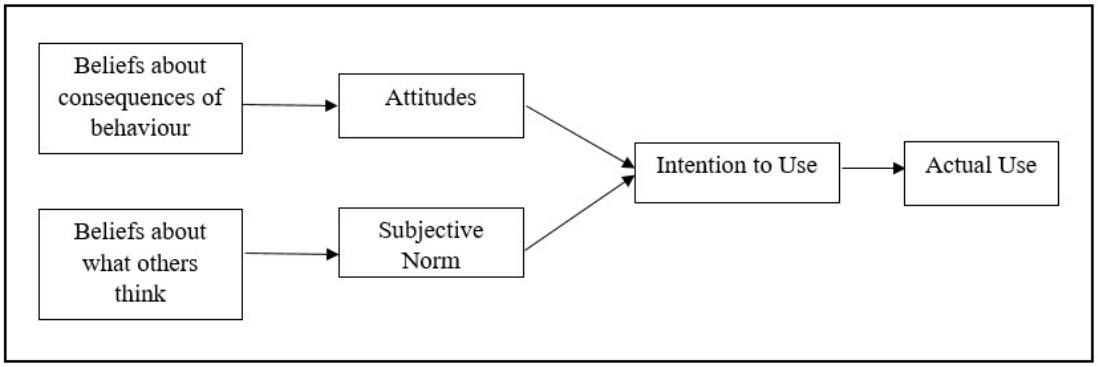


Figure 2: The Theory of Reasoned Action

Source: Tan (2013)

In its place, he identified perceived usefulness and perceived ease of use to be enough to predict the attitude towards behavior which jointly influenced the attitude toward a new technology as shown in figure one above(Takele&Sira,2013).

Davis (1986) defined perceived usefulness as the prospective user's subjective probability that using a system will increase their task performance. Perceived ease of use was defined as the degree to which the prospective user expects the system to be free from effort. He proposed that both perceived usefulness and perceived ease of use directly influenced the intention to use. Davis (1986) also posited that perceived ease of use influenced perceived usefulness which in turn influenced intention to use and consequently usage behavior as shown in Figure 2. Since the theory was borrowed from the field of Psychology, Davis (1986) included the three major learning domains in the theory. Perceived ease of use and perceived usefulness comprised of the cognitive response (mental skills and knowledge domains). The attitude response fell under the affective domain (feelings or emotions) and the behavioral response fell under the psycho-motor or physical skills domain as shown in Figure 2 below.

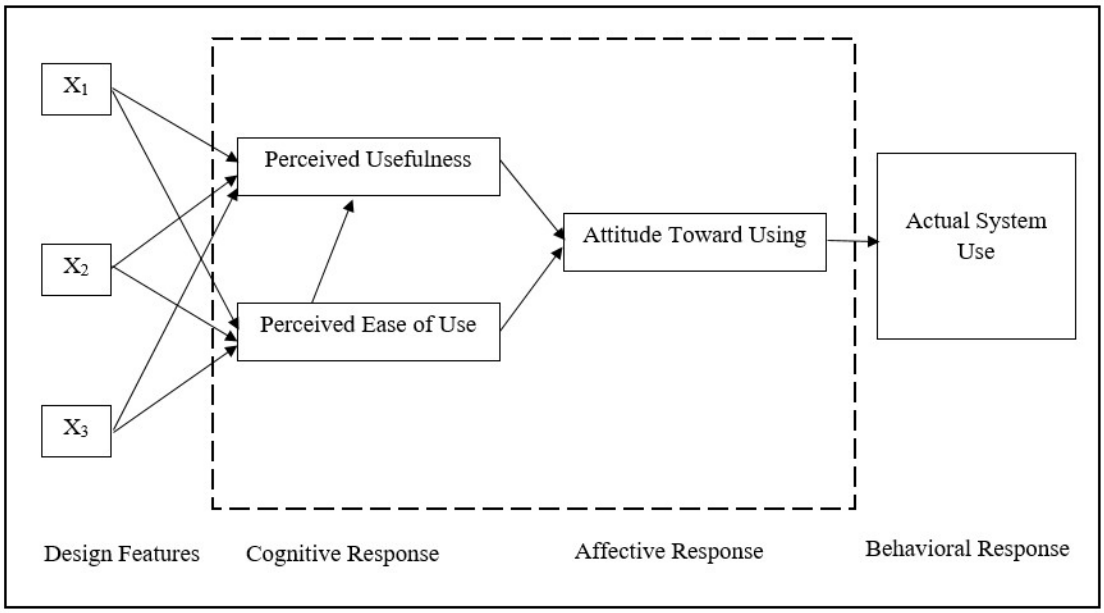


Figure 3:Davis' Initial Technology Acceptance Model

Source: Davis (1986)

The cognitive and affective responses are internal and they take place within the individual's mind and are then expressed in the behavioral response.

The behavioral response is external and is expressed through acceptance or rejection of the design features (x1, x2, and/or x3). The internal responses are enclosed in the dotted box in Davis' initial model as shown in Figure 2.

In 1989, Davis, Bagozzi, and Warshaw extended Davis's initial TAM to include the variable behavioral intention which was influenced by attitude towards use. The behavioral intention then influenced behavioral usage. Davis, Bagozzi, & Warshaw (1989) posited that perceived usefulness directly influenced behavioral intention. They maintained that perceived usefulness was influenced by perceived ease of use which in turn influenced attitude towards use, then behavioral intention, and eventually behavioral usage as shown in Figure 3.

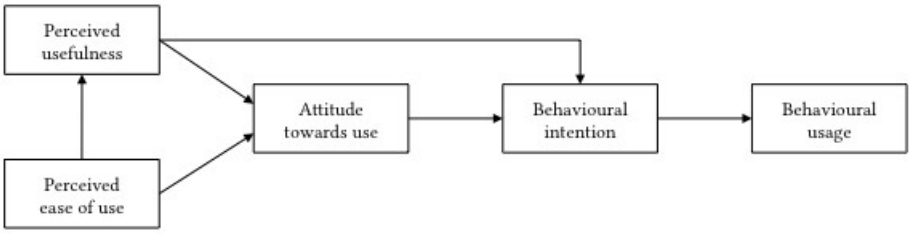


Figure 4: Davis, Bagozzi, & Warshaw's modified TAM

Source: Davis, Baggozi, and Warshaw (1989)

The Technology Acceptance Model was again modified by Venkatesh and Davis in 1996. Venkatesh and Davis (1996) removed the attitude variable holding that it eliminated any unexplained direct influences observed from the system's characteristics. However, they added external variables such as factors influencing both perceived usefulness and perceived ease of use. The external variables included system characteristics, user training, user participation in the design, and the nature of the implementation process although these remained silent on the model as shown in Figure 4.

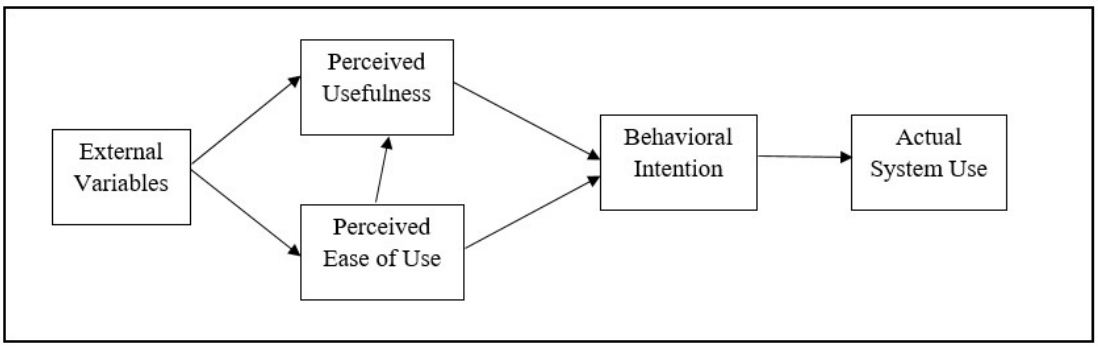


Figure 5:Venkatesh & Davis's modified TAM

Source: Venkatesh and Davis (1996)

Since 1996, many others have modified TAM in many different ways by developing antecedents to either perceived usefulness or perceived ease of use, or both. In 2000, Venkatesh and Davis went on to modify Venkatesh and Davis' TAM and termed it TAM2. TAM2 retained the intention to use and included determinants or factors influencing perceived usefulness.

These were the subjective norm, image, job relevance, output quality, and result demonstrability (Venkatesh&Davis, 2000). In TAM 2 Model, the relationship between subjective norm and perceived usefulness was moderated by experience and that between subjective norm and intention to use was influenced by voluntariness as shown in Figure 5.

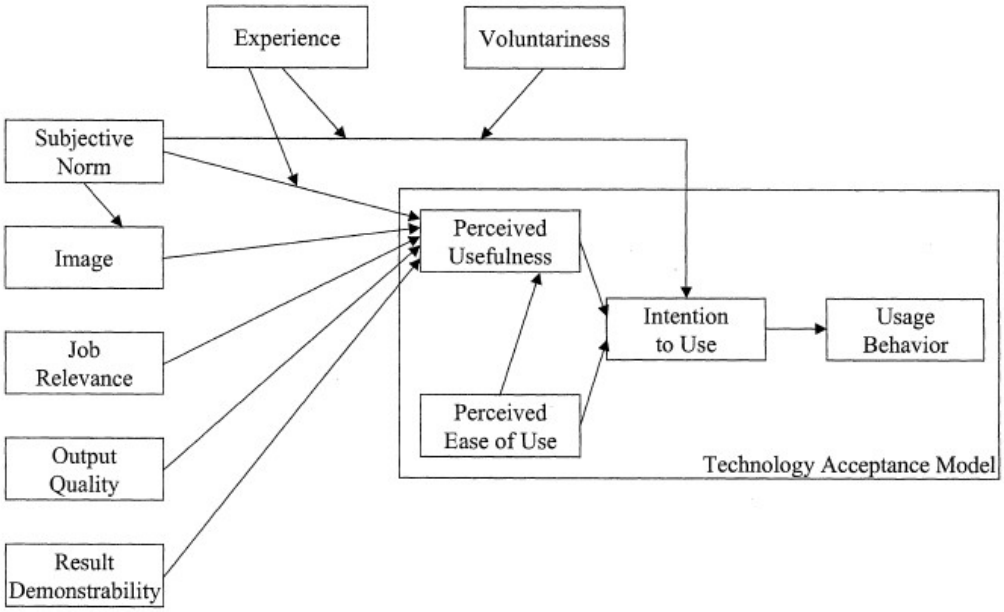


Figure 6:Venkatesh and Davis's modified TAM 2 Model

Source: Venkatesh and Davis (2000)

In 2000, Venkatesh identified antecedents to the perceived use variable and divided the antecedents into two main groups. These were anchors, namely, computer self-efficacy, computer anxiety, computer play-fullness, and perceptions of external control and adjustments, namely, perceived enjoyment and objective usability (Venkatesh, 2000). In 2008, Venkatesh and Bala (2008) further developed a model which they termed TAM 3 by combining TAM 2 and Venkatesh's 2000 model. TAM3 combined the determinants of ease of use and the determinants of perceived use (Venkatesh&Bala, 2008). In 2003, the Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh, Morris, Davis, and Davis. UTAUT was a combination and fusion of prior technology acceptance research and it had four key constructs that influence behavioral intention to technology use (Venkatesh, Morris, Davis & Davis, 2003). These were performance expectancy, effort expectancy, social influence, and facilitating conditions.

Apart from experience and voluntariness being the moderators, UTAUT added two demographic factors, namely age and gender (Venkatesh *et al.*, 2003). Since its conceptualization, UTAUT has served as a baseline model for a majority of information systems(IS) research and has been used to study a variety of technologies in both organizational and non-organizational settings (individual, across countries). The model has been applied, extended, and replicated within new contexts (different industries or countries), exploring new users and adding new constructs to the model (Venkatesh, 2017).

2.9.1 Evaluation of the TAM Model

Although the model has been used in many present-day types of research (Midiwo, 2015: Mapesa; 2016; Phahlane, 2017; Dube & Gumbo, 2017) it cannot be used in every case due to its numerous limitations. Despite TAM's popularity and predictive power (Benbasat & Barki, 2007) and (Bagozzi (2007) have highlighted several unintended problems within the information systems(IS) field, and TAM diverts the researcher from the phenomena. TAM-based research has paid little attention to the antecedents or theory for PEU and PU as bases for decision-making. TAM research stream is limited in examining important consequences of IS adoption, it also fails to account for group, social and cultural processes within organizations which are important aspects of implementation and developing technology in assessing any success or achievement. Due to the saturation of TAM-related research, TAM as a theory has not expanded or adapted its core model limits and its usefulness in a constantly changing IS adoption environment. It is not based on a solid and commonly accepted foundation, resulting in theoretical confusion, chaos, and lack of progress in knowledge accumulation. The biggest drawback is a surprising dearth of any practical implementation and explanation, which was pointed out by (Chuttur, 2009).

An effort was made to integrate IS adoption and use theories resulting in a unified theory of acceptance and use (UTAUT) to resolve some TAM limitations (Bagozzi, 2007; Benbasat & Barki, 2007; V. Venkatesh, 2015) (Venkatesh, 2015).UTAUT comprises three direct determinants of behavioral intention, performance expectancy, effort expectancy, and social influence, as well as intention and facilitating conditions, the two direct determinants of use behavior (Venkatesh, 2015).

Hubona and Cheney (1994), tried to compare two models (TAM and the Theory of Planned Behavior [TPB]), using surveys based on assessing the levels of satisfaction of their users.

They noted that the TAM is relatively easy and clear to use, thus guaranteeing technological acceptance among its users.TAM has emerged as an effective model with the ability to predict the acceptance behavior of users based on perceived behavioral intention and perceived usefulness. The TAM model was used to explore the acceptance of HRIS in the banking sector in South Korea (Suh & Han, 2002). The authors (2002) reported that the ease of use and perceived usefulness dimensions of the TAM model applied to the acceptance of technology in the banking sector of South Korea, encouraging customers to use the system more frequently. This was supported by the study by Pikkarainen *et al*. (2004), who used the TAM model and reported that bank customers in Finland accepted online banking services because of the ease of use and perceived usefulness. Hari (2012) also used TAM in a study to investigate the impact of customer relationship management software on small retail businesses. The findings suggest that both dimensions, perceived ease of use and perceived usefulness affect users' intentions to use the system, which in turn determines the actual usage. Similarly, Sentosa *et al*. (2011) used TAM to investigate the adoption of the Internet by small and medium entrepreneurs in Malaysia. Their study provided empirical evidence showing that two dimensions in the TAM model, perceived ease of use and perceived usefulness influenced users' attitudes toward system usage.

Midiwo (2015) research study used the TAM model in Kenyan public universities. The study revealed that the variables presented in TAM offer practitioners a practical, cost-effective method for evaluating new technology and predicting the degree to which end users will use that technology before the system is implemented.TAM is extremely robust. It was revealed that behavioral intention will have a significant positive influence on the usage of technology. Unless the employees of public universities are willing to use this new technology, HRIS, to transact their HRM functions such as e-recruitment and e-training packages, it may not improve the performance of Kenyan public universities.

Mapesa (2016) used the TAM model in the Health sector in Zimbabwe. His study revealed that deploying new technology and practice innovations in complex healthcare environments is challenging, particularly when the innovation is disruptive to established structures and workflow.

Health information technology (HIT) and the electronic health record are considered disruptive technologies; thus, their integration into practice has been slow and problematic. Clinical environments are complex, unpredictable, and replete with intricate and highly interdependent relationships. Hence, the context in which HIT implementation occurs strongly influences the process outcome. Hospitals and clinics fall therefore into the category of a complex adaptive system(CAS). Implementations in a CAS require creative and critical thinking. This, therefore, suggests that if the development of HRIS is complex and if it is difficult to use, users will not accept or adopt it. However, when the system is easy to use, users can derive benefits from using the system and then show readiness to adopt and accept the system.

The absence of other researchers who used this theory at the local level in state universities, especially in studying the level of human capital analytics adoption combined with the strengths identified (Hubona & Cheney,1994; Suh & Han, 2002; Midiwo,2015) researches made the TAM model more applicable to this study on human capital analytics adoption.

The past researches which used the TAM model were for service industries, the same applies to the host organizations for this study. The use of this theory in this thesis offers room for comparison, verification, and confirmation of data that will be collected from the respondents in this study. The variables presented in TAM offer human resource practitioners a practical, cost-effective method for evaluating new technology and predicting the degree to which end users will use that technology before the system is implemented.

2.10 Kotter Change management theory

Figure 7:Theoretical Framework-Kotter's 8- step change theory

Source: Kotter, (1995).Why Transformation Efforts Fail, *Harvard Business Review*.

This thesis assumed that the implementation of HR analytics implies a change, which thus can be linked to Kotter´s transformation process and create an in-depth understanding of conducting the implementation of HR analytics within organizations. Kotter (1995) listed eight steps within a process of leading change, which contain (1) creating a sense of urgency, (2) forming a powerful guiding coalition, (3) creating a vision, (4) communicating the vision, (5) empowering others to act on the vision, (6) planning for and creating short-term wins, (7) consolidating improvements and producing more change and (8) institutionalizing new approaches change (Kotter, 1995).

(1) Creating a sense of urgency

Kotter describes the first step of leading a change process as creating a sense of urgency to enable the start of implementing a change. According to the author, many organizations underestimate the effects of this step and its impact on the overall change process. Kotter further claims that one key requirement of getting the transformation process started, is to ensure the cooperation of many individuals as possible. Therefore, creating urgencies such as discussing potential crises like a possible drop in the market position or a possible loss in the financial performance or identifying new business opportunities creates the starting point of transformation processes and the change effort.

The implementation and utilization of HR analytics represent such a new business opportunity that can create the above-mentioned sense of urgency to start a transformation process. According to Deloitte (2015, p.10), "companies that take time and make the investment to build people analytics capabilities will likely outperform their competitors significantly in the coming years". This would mainly because the business world can be "characterized by a new 'normal' of fast-paced change, related to advancing technology, skill shortages and competitive pressures". Organizations are also suffering a lot of pressure, which increases the need to take opportunities. Bersin *et al.* (2014b)indicated that research disclosed that more than 87% of business leaders are worried about both retention and engagement, more than 86% are concerned about leadership and 85% are apprehensive about working skills in general. This emphasizes the need for making decisions about human resources more on evidence-based methods to provide possible solutions for these matters. Marriott (2015) added that there is an increased need for senior-level HR managers to understand more about analytics to find answers and being able to identify possible opportunities.

Furthermore, to make a proper selection regarding vendors or simply feel more confident when including data and facts in decision-making processes. Therefore, the drive for becoming more fact-based can be seen as one of the biggest opportunities for HR to improve its decision-making processes. However, it has to be considered that not all employee´s interests are aligned, and thus, not all employees might embrace using sensitive human resource data for analysis purposes (Coolen, 2015).

Expecting a unitarist view at the start of this step might expose a pitfall and hinder the implementation of HR analytics in the starting phase. Since not all employees might share the same opinion (Geare, Edgar & Mcandrew, 2006), not all employees might experience a sense of urgency. Further, as mentioned above, within fact-based management it is being stressed that facts only do not contribute to a proper decision-making process and thus, do not substitute other important requirements for making decisions (Coolen, 2015). This might also hinder the transference of the urgency level to the employees.

(2) Forming a powerful guiding coalition

Within the second step, Kotter highlights the importance of building a guiding coalition that grows over time. The coalition might consist of the head of the organization, the general manager, and as many employees as possible to develop a shared commitment to establish excellent performance. This group of the coalition should be powerful in many terms such as title, information, expertise, reputation, and relationships. Relating the second step to the implementation of HR analytics, the involvement of supportive leadership might be one aspect and hence, represent a challenge. According to Deloitte (2015), companies are struggling with the overall development of leaders as they are facing skills gaps that need to be overcome. Since HR is reinventing itself to deliver business impact and also to be more innovative-driven, leadership that can foster and encourage those goals is required (Deloitte, 2015). Once this kind of supportive leadership is developed a guiding coalition can emerge. To attract people with the work of HR analytics, one has to make sure that the outcomes of these analyses are supportive of business goals. One has to gain the required knowledge to understand the business model, its strategy, and the current challenges the organization is facing (Coolen, 2015).

Further, cooperation with the employees and legal department is required to convince that using the data for analysis purposes is being done concerning legal aspects (Bersin, 2015). Therefore, it is recommended that a training session in data security, privacy, and identity protection for the HR analytics team should be provided to ensure the appropriate use of the data, which will lead to gaining trust and support from the organization(ibid).

Coolen (2015) argues that to sail through, HR analytics consultancy skills are key in spreading the message across the organization. The consultant will translate HR analytics outcomes into business language while being able to explain the general process of HR analytics convincingly with the ability to visualize the outcomes in a non-technical manner (Coolen, 2015). However, the author also mentions that the consultant should maintain in-depth knowledge of analytics as well to be able to answer any questions properly. Further, Kotter claims that the guiding coalition should possess the capabilities to lead the change effort while encouraging teamwork. Bersin (2015) claims that HR analytics is considering change management consultants as inevitable when implementing the recommended changes.

Donaldson (2015) also adds, that knowing the outcomes of analyses will have no impact if the organization does not implement them and thus, turn the advice into actions. Gaining an effective sponsorship will support HR analytics to acquire the needed resources, both technology and human resources, to succeed and focus on the key business challenges needed to be solved (Berry, 2015) Therefore, through cooperation with other departments and transparency, the needed support in terms of a guiding coalition of implementing HR analytics is considered as one key aspect. Within this step, it has to be considered, that while seeking for establishing a group that supports the implementation of HR analytics, a pluralist view might exist (Geare & Edgar & Mcandrew, 2006) as not all stakeholders might share the same level of interest (Coolen, 2015). Therefore, forming a guiding coalition might represent a challenge and should be given awareness.

(3) Creating a vision

The third step of transforming organizations aims to create a vision that supports directing the change effort through the development of strategies to achieve the vision. According to Kotter, (1995), the vision should be easy to communicate and also be attractive to all stakeholders that are affected.When implementing HR analytics, also because it affects the entire HR function and the organization in general, it is necessary to communicate the vision entirely to every stakeholder involved to gain the support of the employees (Farmer, 2014). The new vision of the HR function will be considering analytics as an integral part of its function. This will also exert an impact on strategic work and capabilities building.

Bersin (2014) states that HR practitioners will have to put the effort into certain actions that will support organizations measurably better and significantly different than alternative methods and competitors. The demand for implementing analytics within HR is growing and will be part of the general HR function in the upcoming future (Bersin, 2015) to create insights and provide valuable information to improve decision-making processes. However, since evidence-based management already stressed that facts only do not form the basis for decision-making processes, it is important to mention that data science should be integrated as one aspect of decision-making processes.Through that, also the pitfall of expecting a pluralist view will be avoided.

(4) Communicating the vision

Within the fourth step of the transformation process, Kotter stresses the importance of using communication vehicles to spread the vision as well as the strategies. The guiding coalition should act as a role model and act upon the new vision through its behavior. As many people as possible will be attracted and their willingness to support the organization during the transformation process will increase. According to Deloitte (2013, p.9) "For organizations where analytic support is visible and valued, senior leadership often plays a role in championing the analytics effort." Therefore, for proper communication of HR analytics throughout the organization, a general sense of analytics in operation might be necessary. Hence, the basis for the guiding coalition is given to successfully communicate the vision throughout the organization. The impact of HR analytics and benefits should be preached to all stakeholders, if possible. This can be done by providing courses to share all results and outcomes with the relevant target group such as the HR community to create awareness. Consistency in spreading awareness is considered an important aspect and can be continued in issuing booklets containing the results of further analyses(Mushi, 2014; Coolen, 2015). Also, workshops can be provided to the regular HR community to explain the main principles of HR analytics (ibid). Through that, the HR function itself will gain regular knowledge about analytics and capture opportunities for HR analytics when they occur. Through providing these courses and workshops, the vision as well as the impact of HR analytics can be shared and well communicated throughout the HR community to increase awareness.

One important aspect of communicating the vision through sharing the outcomes is to develop skills such as being able to tell a story while presenting the insights without many technical details and with strong visualization (Coolen, 2015; Davenport, 2015). Further, these insights and the new vision of the HR function must be well communicated to HR and the overall business since their backing and confirmation will support spreading the impact that HR analytics has (Coolen, 2015). Under this step of communicating the vision, Smeyers (2015) argues that a role of a translator, such as an HR business partner, between the analytics department and the business should be staffed, with the ability to translate analytical outcomes into actionable insights for the management team.

The HR business partner should maintain four main skills, such as (1) possessing analytical skills, (2) a comprehensive and widespread understanding of business operations, (3) a high level of consultancy skills, and (4) a high ability to steer projects on cross-functional levels (Smeyers, 2015). Therefore, communication of the vision and impact of the insights HR analytics can provide should be communicated well and spread throughout the HR community and the business. Proper communication is also required according to the pluralist view since it is believed that for an organization to achieve its goals, it is necessary to manage and involve all the different employees (Geare, Edgar & Mcandrew, 2006).

(5) Empowering others to act on the vision

The fifth step attempts to remove everything that does not go hand in hand with the newly created vision, such as obstacles that prevent the change and systems or structures that undermine the vision. Within this step, Kotter encourages risk-taking behavior as well as embracing nontraditional ideas, activities, and actions. The goal of this step is, after the vision and strategies have been communicated, to not make the employees only understand the vision but also remove obstacles that prevent them from acting upon new vision and taking initiative. Empowering action should be seen as removing barriers to those who are to assist in pushing the change effort. Removing obstacles should inspire, promote optimism and build confidence around the change effort. This is all possible through finding individuals with change experience who can bolster people's self-confidence with "we-won you-can-too" anecdotes. Recognition and reward systems inspire, promote optimism and build self-confidence. The feedback that can help people make better decisions is all mechanisms that can empower the change team to act on the vision.

Relating this aspect to HR analytics, one key obstacle to remove is to enable the employees to attain the required skills to apply analytics (Rasmussen & Ulrich, 2015; Huselid, 2015). According to Deloitte (2015), technical and professional skills have become a top priority but many organizations´ training programs have failed to comply with developing and providing suitable workshops where the required skills can be developed. Coolen (2015) also approves this aspect and states that the basics of statistics are inevitable to start HR analytics.

Further, Coolen (2015) claims that gaining general knowledge about the IT landscape can also be beneficial to understand how data can be accessible and identifying unique identifiers between multiple systems. Gaining this knowledge can support the collection of data more efficiently. Therefore, one major challenge for organizations is to develop training programs that support employees to learn how to apply analytics within HRM and thus, enable the employees also to act upon the newly created vision of HRM (Coolen, 2015). Otherwise, HR operations as well as the HR skills will not be able to keep up with business needs. Also, further obstacles can be removed such as simplifying the process of cleaning the data or supporting the integration of big data platforms (Bersin, 2015). Moreover, Bersin (2015) states that more than 80% of organizations are still feeling challenged with reporting tasks due to technical debt in cleaning the data. To empower others to act upon the vision, these obstacles have to be considered and removed. At this point, again, it is important to acknowledge the pluralist view, which claims that not all employees might be sympathetic to implementing HR analytics and thus, not share the same interests. Therefore, Coolen (2015) stresses that transparency in all the steps of conducting analytics within HR is essential and should be an integral part of conducting analyses. Further, when empowering others to act upon the vision, attention should be paid noting that not all employees might share the same opinion and thus, different actions are required to convince all employees, according to the pluralist view (bid).

(6) Planning for and creating short-term wins

The sixth step involves the establishment of a reward system that recognizes visible performance improvements and rewards the employees involved in the improvements made. Short-term wins nourish faith in the change effort, emotionally reward the hard workers, keep the critics at bay, and build momentum. By creating short-term wins, and being honest with feedback, progress is achieved and people are inspired. According to Kotter, (1995), this is a big requirement as any transformation of an organization absorbs both time and effort but the motivation level needs to be held as high as possible. Otherwise, the urgency level will drop. The creation of short-term wins encourages the employees to keep the focus and achieve the objectives and thus, be rewarded.

Rewarding is part of cultural elements and its integration is an important success factor that should be taken into account when implementing change (Huselid,2015). Deloitte (2013) states that small pilot groups did help organizations to effectively plan short-term wins as they yielded tangible results. Through that, the employees´ motivation level is maintained high. Through a consistent way of communicating the outcomes of the insights HR analytics provides, the motivation of establishing HR analytics more and more in daily operations will increase awareness and encourage employees to recognize that high demand for providing more insights exists (Coolen, 2015). This also emphasizes the pluralist view as it highlights the fact that power is not only exerted by management but also by all stakeholders that contribute to the implementation of HR analytics (ibid).

(7) Consolidating improvements and producing still more change

The seventh step of Kotter´s "Leading Change", (1995) states that although the change might be implemented yet, change processes should not end here entirely until behavior towards any implementation of changes has been anchored deeply within the organization's values and routines. By bracing the process with new projects and themes, a new change should be created. Also, support can be gathered externally through hiring, promoting, or developing employees that can support implementing the vision.

Huselid (2015) indicated that change should be a fundamental part of any organization since technology is dramatically advancing which exerts a high impact on how operations will work. Coolen (2015) remarked that HR analytics is about the minimization of human biases, the creation of new insights, taking actions upon those gained insights, and thus, helping employees and creating a consistently high demand for HR analytics. Implementing all these steps and finding out the best practices for each step requires consolidating the improvements but also producing more changes when improvements are still required. Bersin (2015) reiterated that a group of people with different backgrounds are needed to make HR analytics work such as data scientists, consultants, organizational development(OD) experts, visual designers, and IT people. However, this takes time to function properly. Therefore, the search of making more improvements over time is essential to make the HR analytics function work to the best of its abilities.

(8) Institutionalizing new approaches change

The last step requires building relationships between the new behaviors developed with the corporate success and articulating these to everyone involved within the organization. Likewise, it needs to be ensured that future leaders live by the new behaviors and support the leadership style that has been created. Since the major goal of conducting any change within a company is to improve performance as well as efficiency, "the value of major change efforts can be evaluated by determining the extent to which a project influenced measures related to job performance (proficiency) as well as business performance (productivity, quality, and cost). If HR experts are perceived as true business partners, they must become more adept at showing how HR practices contribute to business results" (Ulrich, Schiemann & Sartain, 2015, p.51). One of the hardest parts of HR analytics is the implementation of the changes recommended based on the model (Bersin, 2015). A change management consultant team is highly recommended when implementing those changes to institutionalize the new insights and methods (ibid). In doing so, the need and the demand for gaining continuous new insights can be anchored within the organizational values.

2.10.1 Evaluation of the Kotter Change Management Theory

Even though the theory has been used in many contemporary research projects (Anne Ng'endo, 2014; Negin, 2016; Okemba, 2018; Maganga, 2018) it cannot be used in every case due to its numerous limitations.The eight steps of Kotter that illustrate how change should be implemented however imply that change can be a linear process. Nevertheless, in reality, change might not be manageable step by step as any organization might be confronted by the change in a more chaotic way. Changes in the business environment are influenced by several forces including political, economic, social, and technological. The government also as a stakeholder in some state institutions like universities can put in place regulations that shape and transform how things are conducted in the organization. To contain the Covid-19 pandemic, the government of Zimbabwe imposed lockdown restrictions which necessitated universities to resort to blended learning. Therefore, the proposed steps of Kotter might sound theoretically correct but also might appear less reliable during an actual transformation. Dinesh (2014) analyzed Kotter's eight steps to managing change and pointed out several matters arising.

A 2006 study by Harvard Business Review found that 66% of change initiatives fail to achieve their desired business outcomes. Change is so difficult because of the five most common obstacles to change. These are employee resistance, communication breakdown, insufficient time devoted to training, staff turnover during the transition, and costs exceeding budget. Out of the five common obstacles a change leader can influence and improve employee resistance to change. This is through leveraging the relationship with the change team to address employee concerns on a personal level and asking for their feedback and responding to their concerns honestly and openly. Communication breakdown can be mitigated by communicating key information to employees on an ongoing and consistent basis. Meanwhile, staff turnover can be curbed by involving the change team in the initiative, coaching, mentoring, and enriching their roles. Costs exceeding budget and insufficient time devoted to training factors are usually factors that fall within the scope of a training manager and the approval by top management. The change agent can sometimes be found without much influence.·

In step one, Kotter begins by creating a sense of urgency without mentioning the vision. Dinesh argues that individuals are unlikely to abort the status quo and embrace change when the future is not yet promised to them. He objects that it only creates a 'fake urgency' unlike the 'true urgency' statement.

He also mentioned that while step three talks of an ambitious vision, it is relevant in organizations. However, the theory fails to acknowledge that there is no set parameter to legitimize a vision.

It is therefore incumbent upon the leadership to estimate the set vision based on mutual agreement with the coalition team. The other challenge in change management is resources, more often than not, resources have to be acquired to achieve change objectives. These resources are almost always never enough, organizational leaders tend to employ political strategies in the distribution of scarce resources. The organizational structure and systems can also be an impeding block in change management. Some organizations have tall structures and bureaucratic practices that require long procedures and approvals before a project can kick off. This makes it difficult to implement change within the short timelines provided. The matrix structure may play a role in complicating the change process.

Negin's (2016) research study on Netherlands' banks and insurance companies used Kotter's change management theory. The study was not able to measure the outcomes HR analytics have on business matters, such as its contribution to business decision-making processes. This was because companies researched were at their starting point of the implementation of HR analytics. Ng'endo's (2014) study in Kenya used Kotter's change model in the Tobacco industry. However, there were change management challenges for the employees when they wanted to execute change. Not everyone was delighted with the change, most people preferred the status quo and viewed change as a threat. The British American Tobacco (BAT) management used various strategies to bring employees on board and make them buy into the change idea. Some of the strategies include peer influence. It is argued that it is easy for one to listen to peers and get influenced by them. Resources were another challenge at BAT Kenya, the interviewees collectively agreed that this has been an impeding block for most change projects as some objectives have not been achieved because of the limited resources. The most crucial projects were given top priority and most resources were dedicated to these projects. This led to a backlog of unattended projects that have been put aside due to a lack of resources.

Locally, Maganga (2018) used the change management theory of Kotter in his applicability of the business excellence model as an effective strategy to turn around the National Railways of Zimbabwe study. It was observed that the change management strategy of being able to diagnose accurately change forces affecting an organization has a positive effect on State Owned Enterprises (SOEs) performance.

Forces impacting the NRZ include indirect competition arising from reliable and swift road bulk cargo carriers, lack of financial capabilities to fund retooling, and government policy directions. Finally, leadership is the overarching component that drives excellence for the achievement of improved organizational performance. Therefore, it is imperative that organizations design performance assessment criteria that focus on leadership performance. Leadership is the driver of all the enabling systems and processes that enable the organization to achieve the result matrices.

Since the Negin (2016) research study in the Netherlands was conducted within the financial and partly insurance services sector, research also addressing the implementation of HR analytics in other service industries like state universities would be interesting. Through globalization, organizations are forced to undergo changes and transformations constantly to increase their effectiveness, also in decision-making processes. Most likely any transformation implies facing challenges and requires all the parties concerned to adapt and support finding solutions. The full utilization and implementation of HR analytics represent such a transformation as it restructures the HR function by integrating analytics as an integral part to enable the measurement of HR outcomes and develop a decision science within HR.

Kotter (1995) pointed out that for the change management process to be successful, the eight steps need to be followed step after step without skipping any. The Ng'endo (2014) research revealed that management at BAT Kenya would at times skip some steps or execute a step before another that comes first in the model. For example, while handling the small changes at times, the vision of the change was developed before the guiding coalition was set. This is a deviation from Kotter's model but it still worked well for BAT Kenya. Kotter's eight-step model emphasized a lot on the communication of the vision in the entire organization for a buy-in. The model also emphasized the generation of short-term wins. The management at BAT demonstrated that they take the communication stage very critically. The interviewees said that they communicate the objective of change every day in very different ways including games, emails, posters, word of mouth, and in small groups. BAT management had set up a leading team depending on the change project.

When it is a big change, a team of members from different departments is appointed to lead, but when the project is of a smaller magnitude, one champion is selected to carry the mantle. This is in line with Kotter's model. Past research revealed that leadership can be a challenge to the change management process (Kotter, 2007). He explained that at times the leadership team may not fully support the change and it will take a long time for the approvals to be given. This has not been the case as seen by this research. Management at BAT ensured that the first step is to get the leadership in the loop. In doing this, the process begins and flows to the end with the approval and guidance from the leadership team.

Maganga (2018) used the change management theory of Kotter at the National Railways of Zimbabwe study but not in state universities. The absence of other researchers who used this theory at the local level in state universities, especially in studying the level of human capital analytics adoption combined with the strengths identified by Negin (2016) and Ng'endo (2014) researches made the Kotter change management theory more applicable to this study on human capital analytics adoption. The use of this theory in this thesis offers room for comparison, verification, and confirmation of data that will be collected from the respondents in this study because change is diverse and also occurs in varied forms. The theory emphasizes the significant role played by individuals, in this case, both leaders and employees in the process of change implementation within the scope of human capital analytics adoption. Individuals must be sensitized to the impending change because change evokes a reaction that can either be in the form of resistance or acceptance based on the expected outcome from it. Leaders are the engineers of change and are therefore tasked with the responsibility of designing visions that will be achieved through rightful approaches. Kotter's model is a model that talks of leadership traits. Kotter mentions that the majority of organizations fail to excel in the market because of a leadership that is short of the relevant skills for change implementation. The model, therefore, brings out a list of eight tasks that leaders must perform to surge in the chosen direction of human capital analytics adoption.

2.11 Diffusion of Innovation Theory

Rogers (2003) defined Diffusion of Innovation as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (p. 3). Diffusion of Innovation (DOI) Theory, developed by E.M. Rogers in 1962, is one of the oldest social science theories. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses through a specific population or social system. The result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption means that a person does something different than what they had previously for example, purchase or use a new product, acquire and perform a new behavior. The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible within organizations.

Adoption of a new idea, behavior, or product which is "innovation" does not happen simultaneously in a social system; rather it is a process whereby some people are more apt to adopt the innovation than others. Researchers have found that people who adopt an innovation early have different characteristics than people who adopt an innovation later (Rogers & Scott,1997). When promoting an innovation to a target population, it is important to understand the characteristics of the target population that will help or hinder the adoption of the innovation. There are five established adopter categories, and the majority of the general population tends to fall in the middle categories. It is still necessary to understand the characteristics of the target population and the different strategies used to appeal to these different adopter categories when promoting an innovation.

Innovators-These are people who want to be the first to try innovation, they are venturesome and interested in new ideas. These people are very willing to take risks and are often the first to develop new ideas. Very little, if anything, needs to be done to appeal to this population.

Early Adopters-These is people who represent opinion leaders. They enjoy leadership roles and embrace change opportunities. They are already aware of the need to change and so are very comfortable adopting new ideas. Strategies to appeal to this population include the provision of how to manuals and information sheets on implementation. They do not need the information to convince them to change.

Early Majority-These people are rarely leaders, but they do adopt new ideas before the average person.

That said, they typically need to see evidence that the innovation works before they are willing to adopt it. Strategies to appeal to this population include success stories and evidence of the innovation's effectiveness.

Late Majority-These people are skeptical of change, and will only adopt an innovation after it has been tried by the majority. Strategies to appeal to this population include information on how many other people have tried the innovation and have adopted it successfully.

Laggards-These people are bound by tradition and very conservative. They are very skeptical of change and are the hardest group to bring on board. Strategies to appeal to this population include statistics, fear appeals, and pressure from people in the other adopter groups. The stages by which a person adopts an innovation, and whereby diffusion is accomplished, include awareness of the need for an innovation, decision to adopt (or reject) the innovation, initial use of the innovation to test it, and continued use of the innovation. Five main factors influence the adoption of an innovation, and each of these factors is at play to a different extent in the five adopter categories mentioned above.

i. **Relative Advantage**

The degree to which an innovation is seen as better than the idea, program, or product it replaces. Robinson (2012) explains the relative advantage of innovation as the degree to which an innovation is seen as more advantageous than the idea it supersedes by a particular group of users in terms of economic advantage, social prestige, convenience, or satisfaction. He stresses that the rate of adoption is positively correlated with the perceived relative advantage of an innovation. The general understanding according to Mndzebele (2013) is that organizations need to understand that adoption of innovation provides solutions to inefficient traditional systems and presents new opportunities in the form of increased productivity and operational efficiency. This is in line with the point of view by Al-Jabri and Sohail (2012) that indicated that a system that is perceived to provide increased efficiency, economic benefits, and enhanced status positively leads to a high rate of adoption. Organizations only adapt to technology when they are confident that a certain technology will add value to their existing state. This means that when a user perceives the relative advantage or usefulness of a new technology over an old one, they tend to adopt it (Al-Jabri & Sohail, 2012).

ii. **Compatibility**

Compatibility is "the extent to which an innovation is considered as being consistent with the existing principles and standards of behavior, past experiences and need of potential adopters" (Rogers, 2003: 15).

Equally, Lee Hsieh and Hsu (2011) define compatibility as the extent to which innovation is consistent with the potential end users existing principles and standards of behavior, prior experiences, and needs. Evenly, Mndzebele (2013) concludes that the more users regard the system as compatible with their felt needs, the greater the diffusion rate.

iii. **Complexity**

This refers to how difficult the innovation is to understand or use. Several researchers attempted to define complexity in innovations, notably (Al-Jabri & Sohail, 2012) who define it as the extent to which an innovation is considered cumbersome to learn and use. Similarly, Zaltman, Duncan and Holbek (1973); Rogers(1995) defines complexity as the degree to which the innovation is difficult to understand and use. Lee, Hsieh, and Hsu (2011) posit that new ideas that are easy to learn are accepted faster than innovations that require the adopter to develop new knowledge and skills.

iv. **Observability**

Observability is defined as the degree to which the results of the innovation are visible to others (Moghavvemi, Hakimian, & Feissal, 2012). Al-Jabri and Sohail (2012) expanded this definition to describe the extent to which an innovation is visible to the members of a social system, and the benefits can be easily observed and communicated. The attribute of observability is divided into two constructs; result in demonstrability (the tangibility of the results of using an innovation); and visibility which refers to the extent to which potential adopters see the innovation as being visible in the adoption context (Moghavvemi, Hakimian, & Feissal, 2012). Chigona and Licker (2008) posit that it is easy for others to see the outcome of adoptions from those who have already accepted the technology. They indicate that the rate of adoption of an innovation is affected by observability.

v. **Liability**

It is the extent to which the innovation can be tested or experimented with before a commitment to adopt is made. At this very point, outright adoption may be risky and therefore the intended users will try out the product/service first. Noncontinuous innovations generally have little trialability (Chigona & Licker, 2008).

2.11.1 Limitations of Diffusion of Innovation Theory

An innovation may mutate in the process of diffusion thereby affecting the diffusion process and this has not been accommodated by this theory (Kiplang'at & Majanja, 2005). The theory also states that diffusion is only a one-way thing; it moves from the opinion leaders down to the locals. Sometimes, an invention may rise from the locals, and is upon the rest to adopt the innovation(ibid). The innovation adopters do not fall within a definite line. This is because with one invention, the now innovator will be laggard and the now laggard will be the innovator. It works better with the adoption of behaviors rather than cessation or prevention of behaviors. It does not take into account an individual's resources or social support to adopt the new behavior or innovation. The diffusion of innovation theory does not quite give a clear prediction of how the innovation will be successful after going through the implementation.

2.11.2 Application of Diffusion of Innovation (DOI) Theory to HR analytics

The functional value and applicability of DOI theory to many disciplines are documented by its use in empirical research over the past several decades. Educators examining adult education practices (Cervero & Rottet, 1984), medical researchers interested in the adoption and use of new drugs by medical doctors (Leslie & Rosenheck, 2002), and scholars of public health policy (Bradley, Webster, & Baker,2004) all have applied the theory to their work. An additional testament to the validity and usefulness of the theory is its ability to evolve and continue to apply to emerging innovations, management, and social science issues (Dearing, 2009; Ali, 2016; Dube & Gumbo, 2017; Scott & McGuire, 2017). This theory was chosen for this study because it relates to the study in that diffusion of innovation explains and determines the rate of adoption of technology (human capital analytics) in a society (Zimbabwean State Universities).

The strength of the theory is that adopters and non-adopters of an innovation may be studied to identify the factors that influence their adoption behavior (Lewis, 1997:7; Ojiambo, 1989:38). Therefore, this study sought to find adoption factors influencing human capital analytics among human resource professionals in Zimbabwean State Universities.

2.12 Technology-Organization-Environment Framework (TOE)

Tornatzky *et al.* developed the TOE Framework to appraise technology adoption in organizations (Tornatzky *et al*, 1990; Habiboğlu *et al*., 2020). The TOE framework depicts the way how an organization influences the effectuation of innovations (Handayani & Mahendrawathi, 2019). TOE describes the process by which an organization adopts and utilize technological innovations as influenced by the technological context, the organizational context, and the environmental context (Tornatzky and Fleisher 1990). The technological aspect consider the interior, extrinsic technologies and the processes that are vital to an organization. Meanwhile, the organizational context pertain to the characteristics and resources of an organization, including its size, state of integration, degree of rationalization, managerial structure, people resources, amount of slack resources, and connection among employees. Lastly, the environmental context includes the magnitude and composition of the business enterprises, an organization's contenders, the macroeconomic circumstances, and the regulative state of affairs (Samy *et al.*, 2023). These elements present both opportunities and challenges for technological innovation in organizations today (ibid). Therefore, these three elements determine the way an organization values the need to adopt new technology to improve its work processes. TOE model has empirical support of previous human resource studies conducted in various organizations (ElNakib *et al.*, 2021; Kutieshat & Farmanesh, 2022).

2.13 Conceptual Framework

The conceptual framework below represents the researcher's synthesis of the literature on the factors impacting the adoption of human capital analytics in Zimbabwean state universities. A conceptual framework is a structure that the researcher believes can best explain natural progression of the phenomenon to be studied (Camp, 2001). It is the researcher's explanation of how the research problem would be explored in an integrated way. It is arranged in a logical structure to aid provide a picture or visual display of how ideas in a study relate to one another. The framework makes it easier for the researcher to easily specify and define the concepts within the problem of the study (Luse, Mennecke & Townsend, 2012). Figure 8 below depicts the conceptual framework for this thesis.

In this case, the independent variables are length of time since the introduction of human resource information systems, organisational dimension and human dimension factors and the dependent variable is the level of adoption of human capital analytics. Length of service means the period since the concerned organizations started using Human Resource Information systems as one of the human capital analytics tools. The level of adoption of human capital analytics refers to the descriptive, predictive and prescriptive levels as indicated elsewhere in chapter one. Concerning human dimension factors, analytical competencies refer to the human resources analytics team's ability to measure variables, build causal models, and accurately test them. It also includes the ability to communicate the results of sophisticated models to managers by telling a compelling story. This includes educating the organization and most HR business partners in the basic logic and terminology of HCA. Top management support means the provision of resources and policies in the implementation of human capital analytics. The ability of university top leaders to come up with new ideas concerning the use and adoption of human capital analytics. The ability to think, take risk and act independently. Top management support also refers to the availability of a supportive environment and adequate resources provided by an organization's top management for adopting human capital analytics in the organization. Perceived cost means the implementation costs for technology innovations comprising initial development investments and recurring operating expenses for technology adoption. This study investigated these factors as challenges that hinder HCA adoption in Zimbabwean state universities.

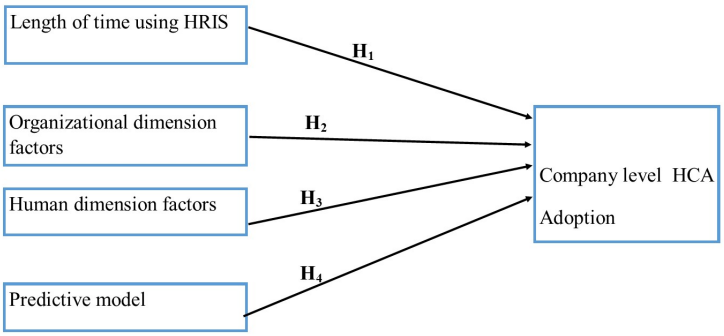


Figure 8: Conceptual Framework

Source: Researcher's own drawing, 2020

2.14 Length of time using HRIS

Human Resource Information System (HRIS) also known as Electronic Human Resource Management (e-HRM) consists of systematic procedures and functions for acquiring, storing, manipulating, retrieving, analyzing, and disseminating pertinent information concerning an organization's HR (Lippert and Swiercz, 2005). Gueutal and Stone (2005) acknowledged the use of technologies for HRM practices and policies as maturing within organizational life. However, academic involvement in HRIS started relatively late and is still trying to catch up with practice (Stanton and Coovert, 2004; Townsend and Bennett, 2003). Lydgate (2018) study discovered that organizational HR information systems may be functionally restricted and only report historical data, resulting in descriptive analytics. Traditional analytics, while useful for reporting, is incapable of predicting critical employee and organizational outcomes. Instead of investing more resources in HR analytics, a company's focus may be on the day-to-day operations of running a business and achieving stability. Furthermore, current HR analysts' and managers' knowledge, skills, and abilities, particularly their quantitative skills, influence the extent to which HR analytics will result in prescriptive action in support of strategic business initiatives.

A survey by Collins *et al*. (2017) revealed that few organizations are successfully using analytics and the response to HRA is still bleak. HRA is primarily used for enhanced reporting, still often spreadsheet-based (Jones, 2015). Some of the reasons provided in previous studies for the failure to use HRA include the lack of a simple archetype that informs the use of analytics and the lack of skills (Angrave *et al*., 2016; King, 2016; Minbaeva, 2017; Reddy & Lakshmikeerthi, 2017). Collins *et al*. (2017) reported that while 71% of respondents rated analytics as an area of priority, only 8% believed they had usable data. Other reasons are costs, challenges of integrating information systems, and lack of executive management support (Kapoor & Kabra, 2014; Tonidandel, King, & Cortina, 2016). Some researchers noted emerging ethical issues and a lack of an appropriate legal framework (Pape, 2016; White & Ariyachandra, 2016). Some researchers supported the view that organizational culture is one of the factors that encourage or hinder HRA (Ames, 2014; Kapoor & Kabra, 2014; Levenson, 2017; Sharma & Sharma, 2017; Tableau, 2016).

Togt and Rasmussen (2017) suggested companies that already have robust management information systems are deriving value from fact-based decisions but estimated the return on investment at only 80% without advanced analytics. For firms to maximize their big data analytical and HR system investments, HR professionals need to have relevant skills to use the software optimally and analyze the information astutely.

From the foregoing, it is clear that many organisations indeed have human resource information systems as some of their work tools. However, not many of them use the tool to do human resource analytics up to the last level of prescriptive analytics. Some notable reasons are revolving around what the management wants to do with the technology, lack of appreciation of technology, costs and organisational culture. In sum, the length of time using HRIS does not materially translate to full adoption of human capital analytics.

2.15 Organizational dimension factors inhibiting the adoption of human capital analytics

a. Perceived cost

Funds to buy hardware and software licenses and maintenance of HRIS is a crucial factors for the adoption. Adopting HRIS can be challenging because it can be costly and it can take long periods before espousing pre-adoption benefits become available after HRIS is fully assimilated (Ashbaugh & Miranda, 2002). In particular, HRIS adoption in the public sector may be even more challenging than in the private sector for several reasons. Public sector organizations have different underlying goals to those operating in the private sector, in that the former may have multiple intangible goals such as health and education) unlike the latter which is typically driven by economic viability considerations (Kamal, 2006). Also, due to budget timing restrictions, public sector organizations may be subject to constraints of budgeting cycles which may be dictated by political influences or periodic changes in political priorities (Caudle *et al*., 1991; Themistocleous *et al*., 2004). Ziederman and Arberecht (1995) observed that higher education the world over is said to be in crisis that extends from financial to concerns about quality, relevance, equity, and specific missions of institutions. However, among these problems, the financial crisis appears to be of particular concern. Boyer (1993) observed that funding in higher education was at the heart of the world crisis. The financial crisis in education in most countries is much deeper than macro statistics reveal and is not going to disappear soon, especially in developing countries(ibid). Ayoo (2002) observed that one of the greatest challenges facing African Universities currently is finance or lack of it. This resulted in most universities' inability to implement most of the projects proposed. There is a critical need to identify possible sources of funds to supplement the dwindling support from the respective governments and the other formal channels on how to get access to their funding.

b. Top management support

Despite HR analytics being associated with successful companies such as Google, Apple, Disney, Amazon, and Microsoft (Bock, 2015; Morgan, 2017), some companies have been reluctant to design and develop an HR analytics function (Falleta, 2014; Rasmussen & Ulrich, 2014). Building the necessary support from upper management and decision-makers to support the HR analytics initiative will be the first challenge HR leaders may face before implementing a robust analytics function (Rasmussen & Ulrich, 2015).

HR leaders should acknowledge any barriers, such as cost, time, capability, and bandwidth, the company may face when implementing HR analytics, but also be able to demonstrate how a properly designed function will outweigh the costs and result in improved organizational performance. If HR leaders can gain buy-in from executive leaders and convince them to invest in HR analytics, the function is more likely to gain sufficient funding for the resources needed to implement a successful analytics function (Hunt, 2014). One-way to encourage buy-in from managers is incorporating compelling data and information and data visualizations that aid in understanding the impact of HR analytics on organizational performance (McAfee & Brynjolfsson, 2012).

For example, the performance yield curve is a well-known visual aid for understanding the impact of business operations and management practices on strategic value and performance in an organization (Boudreau & Ramstad, 2007; Cascio & Boudreau, 2011). Top management support is essential for innovation adoption (Premkumar, 2003; Troshani *et al*.,2011). It is crucial to overcome possible internal resistance and allocate resources to assist facilitate HCA adoption and ensure successful implementation. Top management support can be about initiatives such as training, and manuals investments before HCA adoption to ensure an easy transition.

Ukandu, Iwu, and Allen-lle (2014) research study in South Africa on challenges faced by human resource management staff members regarding the use of the E-HRM system revealed that there is a need for data analysis expertise in the HR departments of South African universities. It was revealed that there is inadequate knowledge of data integrity and technical expertise in the HR departments. There was also an indication that new staff members need to be trained on the use of the E-HRM system to enable them to have better staff performance in the use of the E-HRM system. The research study revealed that the system is costly to maintain (upgrade issues).

This finding especially validates the conclusion arrived at by Iwu and Benedict (2013) who were of the view that HR departments may be under pressure to prove that their E-HRM systems are an investment that will pay off and not just an additional cost. A supporting organizational setting, including a skilled workforce, can be critical for successful innovation adoption (Lin, 2006). HRIS expertise or human capability is a significant factor influencing the adoption of HRIS.

HRIS was found as an important factor in the adoption of new technologies in a study by Kwon and Zmud (1987). Therefore, the successful adoption of HRIS requires the availability of skilled HRIS professionals in the organization because if the users lack understanding of the system features that can be a major obstacle in HRIS adoption.

Troshani (2011) indicated that training was needed for all user levels such as operational and strategic levels to increase their knowledge and skills in using the system effectively. Makwinja's (2015) study also noted that factors are hindering the successful implementation and use of human capital information systems(HCIS) at ZETDC, ZIMRA, and Tel-One. These factors were identified as a failure to attract and retain HCIS expertise, resistance to change and fear of the unknown, setting unrealistic objectives, lack of senior management commitment, lack of proper implementation strategy, lack of understanding of HCIS among users as well as conflict in priorities between departments. The study further revealed that the main challenge that has been mainly affecting Tel-One was the organization's failure to attract and retain HCIS expertise. Furthermore, the lack of top management support highlighted at Tel-One was the genesis or an exacerbation of the organization's failure to attract and retain HCIS expertise as top management might be failing to support HCIS at Tel-One by not investing in retaining and attracting HCIS expertise. On the other hand, at ZETDC it was revealed that they were being hindered by low key user investment during HCIS implementation. Additionally, low key user investment during HCIS implementation could also have been due to a lack of user involvement participation which was revealed. While at ZIMRA their main challenge was the lack of understanding of HCIS among users. This challenge was mostly attributable to inadequate training of HCIS users.

c. HR Department support

Ukandu, Iwu and Allen-lle (2014) research study in South Africa on challenges faced by human resource management staff members in regard to the use of E-HRM system revealed that there is a need for data analysis expertise in the HR departments of South African universities. It was revealed that there is inadequate knowledge of data integrity and technical expertise in the HR departments. There was also an indication that new staff members need to be trained on the use of E-HRM system to enable them have better staff performance in the use of E-HRM system.

d. Organizational size

Research reveals that small family business organisations find no compelling reason to operate with sophisticated human resource information systems due to the nature of their operations (Macron, 2021). Mostly, small businesses have few employees and the strict requirement of recording and measuring people endeavours does not exist.Such type of entrepreneurs simply go into business with the general knowledge of monetary transactions and basic business management skills. From another angle, large organisations with branches spread through out different geographical areas need enterprise wide resource planning systems(ERPs) where different organisational functions are synchronized (Hunt, 2014).

e. Training

High level of human capital analytics adoption is associated with requisite training of the identified staff members who can analyze the data and operate the technological gadgets. It was observed that organisational management or leaders are the ones responsible for providing training to their employees such that expected results would be realized (Deloitte, 2015). Nevertheless, this noble idea cannot be left in the hands of management only but human resource professionals themselves should also play a significant part in undertaking professional development courses such that they are kept abreast of technological changes in the corporate business world (ibid).

2.16 Human dimension factors inhibiting the adoption of human capital analytics

i. Analytical Competencies

Mukundan (2017) believes that a lack of capability and competence in terms of technology and skills inhibits HR professionals from moving to the expected level in analyzing HR data. Due to the shortage of HR professionals with the required analytical skills, the dream of wide adoption of analytics in organizations may not see the light of day (ibid). Ulrich and Dulebohn (2015) conclude that HR professionals need to improve their competencies to be able to utilize HR analytics as part of the decision-making processes. Still, Ulrich and Dulebohn (2015) state that they have noted in their studies that many HR professionals have chosen their careers on the basis that they do not need to work with the quantitative side of the business.

The two scholars, however, propose that the ownership of HR analytics should be kept with the line managers. Then, the HR professionals' role would be to make the blueprints to action and present the possible choices to line managers. To get the line managers to commit to HR analytics, they should also be involved in the planning. Bassi (2011) predicts that the absence of the required IT acumen on how the analytics software will be used coupled with the financial skills of the business may compel the HR function to cede responsibility for analytics to the finance and IT functions in the organization. Further expanding on the assertions accounting for the under-utilization of HR analytics in businesses, Deloitte (2015) conducted a study to find out why companies were struggling to move into the analytics arena. The findings indicated that the main reason for this under-utilization is due to what they refer to as the "capability gap". This capability gap entails poor data quality for analysis, a weak business case for introducing analytics change, and a lack of needed analytical skills. Bridging this capability gap will mean a company investing in expensive solutions from external vendors and building this capability internally. In running effective human capital analytics, managers must focus on and address three interrelated facts that can cause a hindrance to this analysis. To Minbaeva (2018), data quality, strategic ability to act, and analytical competencies are needed to design and implement measures toward organizational capability. Therefore, interventions at the individual, structural and process levels of analysis will help drive improvements at these levels.

ii. Negative mind set

Fiocco (2017) identified that the mindset of HR professionals is another potential hindrance to the use of HR analytics. He asserts from his findings that, HR professionals are not ready or do not want to work with figures and numbers due to how they view HR analytics as involving more mathematical and statistical analysis. For this, Rasmussen and Ulrich (2015) strongly recommend that HR analytics is taken outside of the HR department and assigned to Line Managers until the HR function matures in the use of analytics.

iii. Resistance to change

In certain circumstances, employees are afraid to be replaced by machines and end up resisting change that is supposed to improve work processes by reducing excess

workload. Hence, any attempt to introduce sophisticated human resource information system would be met with serious resistance by both young and old (Lije and Kamalanabhan, 2016). For successful adoption of change in form of HR Analytics, proper communication, education and negotiation tactics have to be employed by leaders(Armstrong, 2015). Providing the needed technical support to HR professionals has been found to help increase the level of acceptance of analytics in organizations.

iv. Innovativeness of Senior Management

At the organizational-structure level, a commitment to data quality encompasses investments in robust system solutions, integration with other organizational platforms, and a well-developed IT infrastructure. The development of HCA as an organizational capability requires the development of social structures and an organizational culture conducive to analytics. The easiest approach is one that starts from the top. In other words, top management needs to acknowledge the importance of HCA for the organization. A shift in strategic priorities and the identification of HCA as a strategic priority are definitely helpful (Deloitte, 2015).

2.17. Level of human capital analytics adoption

Minbaeva (2017) research study in Europe proposed a four-level human capital analytics adoption model. Proposition 1. Development of HCA at the individual level requires (a) having committed individuals to ensure flawless data organization; (b) acquiring and developing analysts with needed knowledge, skills, and abilities (KSAs); and (c) encouraging boundary-spanning behavior outside of the overall HCA team. Proposition 2. Development of HCA at the processes level requires: (a) building systems and establishing workflows to continuously support data quality, (b) linking the results of analytics projects with existing organizational processes, and (c) encouraging experimentation and enabling follow-up actions via Human resource business partners (HRBPs). Accordingly, it was suggested that Proposition 3 on the development of HCA at the level of the structure requires: (a) continuous investments in formal, centralized coordination of data collection and organization; (b) creating a culture of inquiry and a habit of making evidence-based decisions; and (c) equipping top management with tools for action, which should be linked to current and future

strategy discussions. Three propositions focus separately on the individual, process, and structure levels. Proposition 4: development of HCA as an organizational capability requires working with all three dimensions of HCA data quality, analytics capabilities, and strategic ability to act simultaneously at the individual, process, and structure level.

Fitz-enz and Mattox's (2014) study comprehensively investigated the role of predictive analytics. The study looked at the three levels that analytics is divided into, namely descriptive, predictive, and prescriptive analysis, and the various techniques that fall under them. Fitz-enz and Mattox looked at the complete range of steps involved in the process beginning from creating an analytic value chain; to the creation of analytic models, the varied processes involved in turning data into information; along with certain examples of predictive statistics and predictive analytics in action. The research study also explicitly cites examples from analytics that demonstrate the use of predictive modeling. This involves the setting up of models that demonstrate how raw data can be used to gain insight and to generate inferences for instance, exit interviews carried out by employers can be an important measure used to understand the reasons behind why employees choose to leave and hence help the organization in talent retention. Besides the adoption of different levels of human capital analytics like descriptive, predictive, and prescriptive analytics, there are other tow important levels of adoption. Generally, there are company level of adoption and individual level of adoption done especially by human resource professionals in different organisations. The company level of adoption means that all three common stages of HRA have been adopted or a certain level of HRA has been officially adopted HR professionals and supported by top management. In order to get a broader picture of the adoption of HRA in Zimbabwean state universities, the researcher sought to analyse the subject matter at company level.

2.18 Empirical Literature Review

This subsection explain key aspects of the scholarly survey of what has been done by others in regard to the research area of human capital analytics. In academic research and when doing literature review, it is important that multiple sources are utilized to get sufficient information about a topic or research area of interest (Doogan & Warren, 2017).

One source might not be sufficient enough to provide a critical apprehension of the subject matter. Thus, it is prudent to locate multiple sources of information so as to able to critically evaluate points of convergence and divergence acquired from different sources. This is an essential exercise in emerging and poorly understood topics. Equally, human resource analytics is an emerging topic that still does not have one universal definition (Marler & Boudreau, 2017). In contemporary research and practice, human capital analytics takes a variety of different labels and forms, showing that the topic is still under intense development. Some of the other labels are: talent analytics as indicated by Chartered Institute of Personnel Development (CIPD, 2013), workforce analytics (Lawler *et al.*, 2004), people analytics (Waber, 2013) and human resource intelligence (Falletta & Combs, 2020). Social science researchers need to identify sources with valid and reliable information pertaining to dimensions of populations, related problem or business phenomena. Furthermore, they can seek information pertaining to professional practice (Begun, 2016).Therefore, empirical literature resources may provide possible answers to some of the issues raised above. In this regard, immediate past researches at international, regional and local levels were identified through different search data bases and search engines.

2.18.1 Global Perspective

Biermann (2018) study in Germany revealed that the growing availability of data and exploitation of new data sources have transformed private life and increasingly shaped business functions. Findings indicate that despite clear chances for Human Resource Management, severe barriers are causing the current infancy stage of people analytics in companies. The main implementation barriers identified were a lack of data quality, access, and analytical skills, privacy issues, implementation costs, a lack of leadership commitment, and cultural change readiness. The extent to which the people analytics promotion will become managerial reality and contribute to the strategic transformation of HRM will thus be determined by whether organizations can overcome the outlined barriers with successful strategies. The consideration of HRA as an important trend among companies has repeatedly been measured overtime. In a global study including HR leaders from ninety-four countries, Deloitte analyzed the perceived urgency of twelve global HR trends in 2014 (Deloitte Consulting LLP & Bersin by Deloitte, 2014).

The study subjects placed talent and HR analytics as the number six priority, with twenty percent (20%) ranking the trend as urgent and fifty-one percent (fifty) percent as important. Only 6% of the respondents considered HRA as not important to them. On the other hand, Talent and HR analytics were ranked lowest in terms of organizational readiness for this trend. Forty-six percent (46%) of respondents stated that they were not ready for HRA, whereas only eleven percent (11%) considered themselves ready. The 2015 study revealed that HR and people analytics is considered most important in Africa (72%), Southeast Asia (71%), and Latin and South America (70%), whereas its importance scored lowest in Central & Eastern Europe (60%) and Western Europe (60%). The 2014 study had different results, possibly due to a different use of analytics as Talent and HR analytics instead of HR and people analytics and different competing global trends. Talent and HR analytics were ranked as one of the top five most important trends in North America (47%), Western Europe (41%), and Asia Pacific (40%), whereas in Africa only 21% of respondents considered it as among the top five trends.

Sierra-Cedar (2015) study on the other hand, researched the adoption of workforce analytics/Planning between different regions; here, APAC was leading with an adoption rate of 15%, followed by Europe and the Middle East with 14%, and the USA with 12%. Canada was far behind with an adoption rate of only 4% according to the study. Sierra-Cedar (2015) also compared the adoption of workforce analytics/Planning of different company sizes, with the result that large organizations (10,000+) are leading with an adoption rate of 17%, compared to medium organizations with 11% and small organizations (<2500) with 9%. In 2014, Deloitte studied the discrepancy in perceived readiness of the HR function by both HR and non-HR leaders. The results show that HR considers itself more ready (41%: "not ready", 12%: "ready") than non-HR leaders (57%: "not ready", 7%: "ready") (Deloitte Consulting LLP & Bersin by Deloitte, 2014, p. 16). Nevertheless, these figures show that the largest proportion of both groups consider HR to be not ready for HRA. Next to readiness and perceived importance scores, Deloitte also reflects upon the current state of HR analytics capabilities. In 2015, 8.44% reported strong HRA capabilities, 35.48% reported that they are "under active development", 25.06% stated they were "planning how to proceed", 34.53% reported limited capabilities and 6.49% were not considering analytics at that time (Deloitte University Press, 2015, p. 10).

Generally, changes between 2014 and 2015 are rather minor in this context; most changes amount to either an improvement by about 4 % compared to the previous year or a decline by about 4%.

Organizations' progress in terms of analytics maturity has been studied by Deloitte as well. In their study from September 2013, Bersin *et al*. (2013) observed that only 4% of organizations that are using any form of HRA were conducting predictive analytics, and only 10% advanced analytics. These figures show that even though HRA is generally considered an important trend by most companies, adoption is going slowly. Especially in terms of analytics maturity, there is still a far way to go until predictive analytics is the norm among a high proportion of organizations. Currently, with only about 4 % adoption, organizations that can base strategic decisions on predictive analytics are still a small minority.

Chahtalkhi's (2016) research study in the Netherlands revealed six categories of challenges faced by HR organizations when implementing HR analytics. The six categories were (1) lack of business/management support and interest, which implies that the business does not recognize the necessity of an HR analytics team and thus, does not consider its benefits and added value. Secondly, data and tools, which implies how to get the data, gaining a solid knowledge on which tools should be acquired as well as which methods are suitable for what kind of analytics techniques.

Third, legal and compliance, (4), roles, which imply the roles that are needed to develop an HR analytics team, (5) training and skills, and (6) communication, which implies the lack of the right communication between the different entities. The results illustrated that almost all three organizations that participated in the investigation mentioned these six categories of challenges, which they have been facing when implementing HR analytics within their organizations. Therefore, this research study assumed that when implementing HR analytics, such challenges might emerge.

Deloitte's 2015 report on the state of workforce analytics in Europe predicts growing investments in analytics, with more than half of the survey respondents highlighting intentions to invest more in skills development and data-system improvements.

The report also stated that "more than 70% of respondents were upgrading or had recently upgraded their core HR systems with the new cloud platforms" (Deloitte, 2015, p. 75).

Etukudo (2019) research study explored how HR managers use analytics to improve company performance in the United States of America using the descriptive qualitative, multiple case study research design. The study revealed that HRA is a value-adding tool that improves company performance by using data to support decision-making, thereby reducing costs and improving the quality of management decisions. Regarding barriers to HRA adoption, the main obstacles detected were a lack of resources, a lack of managerial support, unconducive culture, a lack of skills, a lack of technology, and the lack of standard HRA framework as barriers to HRA acceptance. The HR manager who does not understand how HRA adds value cannot convince leadership which will result in their lack of support and failure to allocate needed resources for technology and skills acquisition for HRA. The inability to correctly put a value on data gathering and analysis to generate analytics that will guide decision-making is a barrier because CEOs may not be willing to invest in what they do not value. Participants indicated that the knowledge around HRA is still evolving and a lot of people, even management, do not have the full grasp of it; so, in implementing, the first strategy should be to build a business case to let the stakeholders see the relevance. There are many ways analytics can affect the bottom line but what is difficult is how to express the quantum; for example, it is difficult to say if we invest X dollars in analytics, we will get Y dollars back on our bottom line.

It was also revealed that failure to convince leadership that they will gain value from HRA and that it will make a crucial difference to the company, means the project will never get approved. Other barriers to HRA adoption that HR managers must overcome include the lack of skills by HR practitioners and data issues. The skill-set required for HRA was a challenge for many HR practitioners and could not usually be found in most traditional HR departments and required engaging someone from outside. It was revealed that the analytical skills needed were the ability to work with data, statistical analysis, economic parameters, and general numerical ability, which is not the forte of most HR professionals. Another significant barrier to HRA revealed was data.

While the participants agreed that data required for meaningful HRA was a combination of internal and external data, there was a noticeable difference regarding data issues in Nigeria compared to the United States. For the Nigerian participants, the challenge presented by data related to the availability of reliable data. The availability of data and the ability to process data are severe challenges for HRA because many people have data but do not know how to extract meaningful information from that data. Unlike the accounting profession which has readily available financial information; HR data sources are limited, so most times HR people must try and generate the data on their own. Describing the Nigerian peculiarities, the study stated that gathering data is a problem, and once data collection is not efficient, it will be challenging to implement HRA. Further, it was revealed that the lack of automated data mining systems is a barrier to HRA implementation.

A similar study by Lydgate (2018) in the United States of America (USA) used the case study research design for a total of 9 US-based firms. The study revealed that despite HR analytics being associated with successful companies such as Google, Apple, Disney, Amazon, and Microsoft (Bock, 2015; Morgan, 2017), some companies have been reluctant to design and develop an HR analytics function. Building the necessary support from upper management and decision-makers to support an HR analytics initiative will be the first challenge HR leaders may face before implementing a robust analytics function.

Bersin (2017) study found that effective use of people analytics is strongly related to improved talent and business outcomes. Companies can leverage HR analytics as an opportunity to reduce hiring costs and attrition via quantifiable methods.

For example, the IBM people analytics team developed an algorithm that allows managers to "deliver personalized coaching and guidance" tailored towards individual employees; as a result, they were reportedly able to reduce employee attrition by 2% (Morgan, 2017, p. 40). The analytics team also developed a program called "Blue Matching" designed to connect current employees with job opportunities within the company, thereby aligning their "skills, performance, location and area of expertise"(ibid). Since implementing Blue Matching, the company completed 500 job placements for employees who otherwise could have left IBM to seek opportunities elsewhere.

Joerik van Dooren's (2017) research study in the Netherlands revealed a low maturity of organizations regarding HR analytics. The study indeed supported the existence of a best practice approach to human resources management. In addition, the study revealed a very basic level of maturity of HR analytics currently applied by organizations located in the Netherlands. Accordingly, it was observed that fifty-three organizations applied some form of HR analytics (including HR reporting), however, only 15,1% of those organizations do this in a sophisticated way, in terms of HR business driver analytics. Although without the required advanced statistical methodologies such as regression analysis, which are not applied by a single organization in the Netherlands at all.

Vargas's (2015) research study in the United States of America on adoption factors impacting human resource analytics among human resource professionals indicated that the factors impacting the adoption of HRA are not only in the hands of the HR professionals but to some extent, the organization as well. If organizations truly want to adopt HRA, they must make available to the HR professionals the tools, data, resources, and support necessary.

A similar qualitative study by Aletaibi (2016) in Saudi Arabia Public Universities sought to explore the extent of the use of HRIS in the HR Departments of public Saudi universities. The findings of the study were that the current level of use of HRIS is affected by a lack of customization and a unified system, inadequate training, poor system, poor service quality, and hindrances to the use and implementation of HRIS. Many departments are not aware of how the system works and that alone affected the existing views of HR about HRIS.

Furthermore, the findings of the qualitative phase showed that usefulness is an important parameter for HRIS use, and participants of the AQU, HU, and SU are aware of this fact, while participants from WBU and AJU showed a lack of awareness. The participants supported the usefulness of HRIS for their daily activities. HR professionals working in Saudi public universities favored greater use of the HRIS in their departments if they perceived greater benefits for their daily activities. The findings also revealed that HRIS use could not be increased until it was designed to save time and reduce actual costs.

It was also observed that the purported advantages of HRIS for Saudi universities are to reduce the time spent on tasks and other routine HR activities. Furthermore, this study revealed the main factors prompting HRIS use in Saudi public universities. The important factors include assistance in the decision-making process, speeding up the decision-making process, fulfilling assessment and training needs, and upgrading traditional HR processes, such as employee recruitment. These factors are mediators for increasing organizational performance and productivity. The basic function of HRIS applications is to enable the users of the system to produce effective decisions, rather than simply creating channels for fast data processing (Lippert & Swiercz, 2005). The data obtained from the qualitative phase indicated that system quality and HRIS ease of use are essential factors for motivating HR managers and professionals to use the HRIS applications. The study found that if these dimensions were poorly organized and structured while designing the HRIS, the users' inclination towards the usage of the HRIS application decreased. This demonstrates that whatever the design of HRIS, two dimensions must be considered, system quality and ease of use, which can represent the measure of success and net profit for organizations (Gable *et al*., 2008). The participants of the qualitative phase of this research also demonstrated that timeliness, flexibility, and content are critical for increasing HRIS use in Saudi public universities. In short, system quality is coupled with many factors, including timeliness, ease of use, authorization, and content and flexibility, which must be supported by the HRIS. Consequently, these factors will increase user satisfaction, HRIS use, and ultimately organizational performance. The lack of training and expertise to use the HRIS in the HR Departments of Saudi universities is an interesting finding reported by this study. Fink (2017) suggests that an end-to-end HR analytics workflow starts with asking the right question and ends with measuring the result to determine whether the action was effective.

However, the Chartered Institute for Personnel and Development (2013) argues that HR professionals do not have enough knowledge, skills, and business insight to ask the right question based on the data that is available to them. Moreover, even if HR professionals do have good and promising approaches related to analytics, their hierarchical position within the organization may hinder their initiatives from being realized (Smeyers, 2015).

Aral *et al*. (2012) demonstrated in their study that organizations with HR analytics, but without HRIS show no performance improvement. To HR analytics, information technology can be both an enabler and an obstacle. Good HRIS act as an enabler for HR analytics, when they capture and store data, and make accessible data across functions, divisions, or geography to generate reports, scorecards, and dashboards (Marler-Boudreau, 2017). However, current HRIS capabilities do not meet the requirements of HR analytics. The latest development in HRIS is the talent development suite, which is an integration of different HR processes, including recruitment, performance management, learning and development, and compensation management.

According to a study by Kaur and Fink (2017), the most used technologies for HR analytics include R, Tableau, Python, SPSS, and Excel. The study confirms that HRIS is not sufficient enough to conduct statistical analysis and data visualization. The most frequent tool used is R, which is favored because of its compatibility with many file formats and other tools like Tableau, and also offers several machine learning packages. The used technology already implies that HR analytics requires advanced statistical and econometric skills that exceed the correlation analysis of dependent and independent variables. To effectively perform HR analytics HR professionals need specific analytical competencies. These include data preparation, research design, root cause analysis, quantitative data collection, data analyses, and multivariate models. This is a complex process, which needs to be translated into an understandable result so that the top management can base their decisions upon it (Angrave *et al*., 2016).

In Silverman and Waller's (2015) study whose main objective was identifying ways of saving money in organizations by predicting who will quit, the researchers explored how Credit Suisse would predict who might quit the company. It was one of the first examples of the now very popular employee churn analytics.

Not only were the analysts at Credit Suisse able to predict who might quit, but they also could identify why these people might quit. Corporate data crunchers identified various factors, which included job tenure, geography, performance reviews, employee surveys, communication patterns, and even personality tests to identify flight risks. This information was provided anonymously to managers so they could reduce turnover risk factors and retain their people better.

In addition, special managers were trained to retain high-performing employees who had a high flight risk. In total, this program saved Credit Suisse approximately seventy million dollars a year. As turnover becomes a bigger worry and expense in a tightening labor market, companies including Credit Suisse Group and many others the world over can analyze a vast array of data points to determine who is likely to leave a post. The idea of people who run analytics teams in this case would be to give managers early warning so they can take action before employees jump ship.

a. **Turnover at Experian**

Employee attrition was a concern at Experian, with turnover levels that were 3-4% higher than desired. They were able to estimate flight risk by developing a predictive model with 200 parameters such as team size and structure, supervisor performance, and commute length. Teams of more than 10 to 12 persons were an example of a danger factor. The analytics team also discovered flight risk triggers, such as when someone relocated further away from the office, which increased immediate flight risk. The model was implemented in many regions with minor variations from the prediction algorithm. These insights, paired with solid management practices, apparently resulted in a 2-3% reduction in attrition for up to 18 months, with an anticipated savings of $8 million to $10 million (Ulrich, 2019).

b. Flight risk at IBM

A comparable investigation was conducted at IBM, where turnover was significant for some business-critical roles. Using IBM Watson machine learning capabilities, the workforce analytics team created an algorithm that includes sources such as recruiting data, tenure, promotion history, performance, role, salary, geography, job function, and more. The corporation also incorporated employee attitude, as determined by its Social Pulse.

The premise here was that when employees are considering leaving, their interaction with social media decreases. Over a four-year period, the investment returned $300 million, and turnover for important roles decreased by 25%. According to the report, production improved while recruitment costs decreased (Ulrich, 2019).

c. **Keeping key talent at Nielsen**

Nielsen developed a forecasting model in 2015. The original predictive model had only twenty variables, which included age, gender, tenure, and manager rating. More variables were introduced throughout time. This exercise revealed several discoveries, including the fact that the first year was the most important. The important touch points of first-year employees were checked. For example, the initial check-in with their boss had to place within a specified time frame following employment, or else a message would be sent. This was a well-established and critical requirement for first-year retention. Although being promoted was a big reason for people to stay, lateral moves were also a strong motivator for people to stay. A notable result was that the workers with the highest flight risk in the next six months were approached, and the organization was able to relocate 40% to a different role. These lateral transfers enhanced an associate's chances of staying with the organization by 48% (Ulrich, 2019).

d. Unilever: automated listening during a hostile takeover

When Kraft Heinz launched a hostile takeover approach in early 2017, Unilever's workforce analytics team demonstrated that analytics could also be used in crisis situations. The team examined organizational networks and developed models to identify potential cost savings. Furthermore, the team was able to monitor the employees' moods and attitudes. This allowed them to see how staff reacted to Unilever's defense strategies. During the crisis, these insights immediately aided decision-making. Clement, vice president of human resources, stated that "the information provided helped both in putting together cost reduction plans and providing information to back up the feasibility of growth plans, so we could show that we were better placed to leverage the strengths of our business than Kraft Heinz."

e. **Engagement at Clarks**

Clarks, a shoe store, investigated the relationship between engagement and financial performance. Because the organization already reported higher-than-average levels of engagement, it investigated the returns of engagement and whether the rewards of engagement would reduce as levels increased. The team collaborated with statisticians who were in charge of the retailer's distribution planning system. The analysis contained 450 company performance data points in total.

The findings revealed that there is a link between involvement and improved business performance. In Clark's case, every 1% (percentage point) increase in engagement resulted in a 0.4% (percentage point) increase in company performance. To learn from this and make it more practical, the team also studied the quantitative and qualitative features of the 100 best-performing stores. They discovered that there was an optimal team size in the store and that a store manager's tenure was a major indicator of performance. As a result, changing store managers frequently resulted in worse performance. The team was able to design a road-map for high-performing stores using these insights. They have developed an engagement tool-set that managers may utilize to boost performance.

According to Ruohonen (2015), there is a need to use predictive analytics in the human resource management area to uncover potential benefits. Although the findings were company-specific, there are broader implications for enterprises. Individual and organizational performance were improved, as were employee engagement and satisfaction, customer satisfaction, increased profitability and sales, and cost savings. These advantages were discovered in areas of importance to these firms, such as human resources. The study's findings highlight the need of leveraging predictive analytics if the company wishes to be a strategic partner in the business.

In Bangladesh, Quasar (2017) discovered that six variables, relative benefit, compatibility, complexity, top management support, HRIS competence, and organization size, were relevant in distinguishing between HRIS adopters and non-adopters. Relative advantage-as revealed by the discriminant analysis results, organizational relative advantage influences the decision to use HRIS. This suggests that adopters see more benefits from the HRIS to the organization than non-adopters.

One probable explanation is that the benefits of HRIS accruing to adopter firms are more direct and obvious, such as automating administrative duties and improving workflow, than the benefits accruing to non-adopter organizations. It was discovered that compatibility influences the decision to implement HRIS. Organizations are understanding that efficient and strategic HR management is a must for success as HR activities grow more intertwined with other business areas. To make this a reality, HRIS must be compatible with other systems.

The intricacy of the HRIS was also discovered to be a major factor in distinguishing adopters from non-adopters. According to the study's findings, senoir leadership assistance is required for innovation uptake. It is explained by the fact that top management support is critical for overcoming potential internal resistance to HRIS adoption and guaranteeing successful deployment. Another important factor influencing the decision to use HRIS is HRIS competence.

Saxena et al (2022) study shows that HR analytics adoption and acceptance is not a cakewalk. Certainly, an organization has to prepare its employees to adjust to new technology by supporting, encouraging, training, building the right attitude to bring change, and leading in an impactful manner.

Kiran *et al.*(2023) research study in India investigated the influence of human resource analytics on organizational performance in the service industry. It was discovered that HR analytics influence assorted human resources activities. The research also proved that HR analytics and HCM positively impact the performance of the organizations in the service industry. Questionnaire survey was Stratified random sampling technique was adopted to select 300 respondents.

Bahuguna *et al.*(2023) research findings based on the literature survey, and bibliometric analysis, reveal the path-breaking articles, the prominent authors, most contributing institutions and countries that have contributed to the HRA scholarship. The results show that the number of publications has significantly increased from since the last eight years, reaching a maximum of over hundred journals in 2021. The USA, China, India, Canada and the United Kingdom were the most productive countries in terms of the total number of publications.

Human Resource Management Journal, Human Resource Management, International Journal of Manpower, and Journal of Organizational Effectiveness-People and Performance are the top four academic outlets in the field of HRA.

2.18. 2 Human Capital Analytics-The African Experience

Mushi's (2014) research study at Tanzania-Ardhi University(ARU) revealed that the current HR system had challenges which include human errors, delays, poor decision-making, inconsistencies, biases, favoritism, high cost, tediousness,

corruption, and lacked transparency. At ARU, 89% of the respondents agreed that the current system caused errors in decisions making. It is even hard to tell whether errors occur by accident, negligence, or maliciously. Although it was revealed that when an error occurs the responsible staff gets punished for negligence. The tediousness and complexity of handling all these staff manually are mainly blamed for errors made by respective officers. Furthermore, 87% of the respondents agreed that delay in making the decision was a challenge in the current HR Management system. Delays in making decisions mainly occur when files are misplaced or needed information to support the decisions is to be obtained/referred from different sources such as closed files. Another reason for the delay could be caused by the manual movement of files from one office to another. The study revealed that sometimes files are misplaced and it may take up to three days to locate them other files get lost without trace and in this case the University lost its records every day.

In other worse situations unfaithful staff temper with records by removing pages or records from the files. It was revealed that Registry staff use computer programs such as Microsoft Excel to locate files from the cabinets. Likewise, human resource officers use a computer to draft correspondences and generate reports; they mainly refer to information from hard files. The findings revealed that, like most public institutions, Ardhi University uses a manual system to manage its human capital. Recruitment and selection, performance appraisals, training and development, and other HR processes such as leave requests, benefits, and compensation are also handled in files and simple computer applications.There is no sophisticated software to run their day-to-day activities and processes. Thus, it was also revealed that the management of staff is becoming more complex and these complexities have resulted in challenges in managing HR at the University.

Midiwo's (2015) research study in Kenyan Public Universities revealed that there were barriers to human resource information systems and analytics for effective overall university performance. Fifty-three percent (53%) of the respondents stated that the cost of installation and maintenance was prohibitively high. Twenty-three percent (23%) blamed poor skills/expertise, as not every employee at the universities knew how to operate the system installed.

Eighteen percent (18%) argued that it was bureaucracy while a paltry 6% believed that it was a lack of seriousness among the institutional leadership.

Phahlane's (2018) study at a local University in South Africa revealed that data or information produced by HRIS in the form of reports is often not properly interpreted to influence decision-making in the university, often the people who are in charge of making sense of the data are scarce. There are skills shortages in the university when it comes to interpreting data analytics to make it meaningful. Interpreting analytics requires both technical (statistician) and business or operational knowledge, without this balance, a statistician will only be able to come up with numbers, and there will not be meaning provided behind the numbers. So someone who understands the operational or business side and the analytics is a better fit. On the acceptance and use of HRIS in the university, it was revealed that one of the challenges at Wits has been to change things around, especially attitudes and mindsets around HRIS. The culture was found to be influencing how HRIS was used and how it could be used better moving forward. The culture was that for each employee in the university, there is a staff file that stores all the HR activities of each staff member, the file is opened upon hiring. This file defeats the purpose of adopting HRIS because one of the reasons the system was adopted was to eliminate the paper trail. Due to the existence of an alternative method for storing information, users tend not to use the system to its full potential. Molefe (2013) research study revealed that South African organizations' usage of HR analytics is still in its infancy and that the concept and its implications are little understood.

It was also found that there is a consensus regarding the importance of HR analytics in organizations and that the HR analytical skills challenge is the main hindrance to implementation. The level of understanding and application of HR analytics amongst practitioners was still not where it could be. Most organizations use HR analytics for standard historical organizational reporting purposes. However, primary data indicated that an increasing number of organizations are moving towards the advanced application of HR analytics. In terms of the maturity levels of organizations, the research revealed that South African companies have a long way to go to reach the desired level of maturity in terms of its full application and adoption.

Udekwe (2016) in South Africa revealed that users lack the knowledge of capturing employee details on the HRIS analysis package Sytems Application and Product(SAP) as evidenced by sixteen (16) of the twenty-one participants (76%) who agreed that they do capture all employees' vital information on SAP. Five (5) of the twenty-one participants (24%) from the oil and petroleum company) indicated that they do not capture all employees' details in SAP. Nineteen (19) of the 21 (90%) participants indicated that not all employees have access to SAP. The oil and petroleum company, they do have the ESS and Management Self-Service (MSS) modules on SAP, but not all the employees' details are captured on the system. The MSS module is used by the managers to view and sign the information captured through the ESS module by their subordinates for control purposes. The ESS module works together with the MSS module to be efficient. Ninety-five percent (95%) of the participants (20) of the twenty-one indicated that they do have information security in place, which is the responsibility of the security in the IT department. They also indicated that part of the security in place is that access to SAP requires a username and password. There are authorization and security teams in place to support the system. The oil and petroleum company has a business recovery procedure in place in case of a natural disaster.

Govender (2019) study used a case study approach by way of a comparative study of HRM systems in two universities in the Eastern Cape of South Africa. A mixed-method approach was utilized in this study. The results of the study indicate the need for a relevant, localized HRM Model which meets the needs of South African universities and other sectors in South Africa.

The current HRM curricula used for the training of HR practitioners needed to be reviewed to ensure relevant content is covered in preparing graduates for the workplace. Further, institutional executive general management and HRM capability require attention and a renewed focus on HRM development and capacity building. The capability of the executive management of universities was found to be a key factor in the advancement of transformational change. In addition, the need for localized HRM research with a specific emphasis on HR practice and effectiveness as well as the location of HRM within the South African legislative milieu emerged as a critical factor. Finally, the institutional positioning of HR needs to be addressed in terms of structural alignment and decision-making capability.

Bartai (2014) in Kenya investigated the perceived effects of the extent of the adoption of human resource information systems on the performance of public universities in Kenya. The study established that though the Universities implemented various HRIS systems, HRIS is mostly being employed as an administrative tool more than a strategic tool in public universities. The role that HRIS can play in improving the efficiency and performance of the Universities was missing as HRIS was not made important in the HR department of the organization. The respondents could not establish a direct link between HRIS and its impact on their routine work, especially on Human resource management practices namely performance management, human resource planning, recruitment, selection, and training and development. So even though HRIS appears to have tremendous promise, it has not been fully utilized according to its potential in the public universities in Kenya.Boakye's (2019) research study in Ghana sought to investigate the implications of HR analytics on human resource management practices from public and private organizations in Ghana.

The findings revealed that Microsoft Excel, Microsoft Power BI, and regression and decision trees were the predominant tools and methodologies used in HR analytics. The study further found that the use of HR analytics had brought great gains in how applicants are recruited for job roles, performance has increased both at the individual and organizational levels and the best talents retained for continuous growth and effectiveness. Finally, the study revealed that organizations that use HR analytics faced several challenges as a lack of HR analytics competency, lack of management support, and poor data and tools management in appropriately digging into their employee data.Ejo-Orusa, Okwakpam, and Amina (2018) research study in Nigeria examined the impact of the use of predictive analytics (PHRA) on Human Resource Management (HRM) Practices (recruitment & selection, performance management, and succession planning) amongst HR Practitioners in Port Harcourt. A correlation analysis was done to determine the nature of the relationship that existed between PHRA and the HRM practice. Also to predict the significance of the relationship between PHRA and the outcomes of HRM practices (recruitment & selection, performance management, and succession planning). The outcome from the correlation analyses showed that there is a significant positive relationship between PHRA and the HRM practices used for the study. It was concluded that PHRA is an important factor in enhancing HRM practice outcomes.

Therefore, the study recommended that HRM practitioners should embrace the use of PHRA in their practices. It further emphasized that practitioners should not just stop at mere data presentation but strive to move a step further to predictive analytics in their practices to effectively and efficiently improve the human resource practice outcomes in their organization. The study provided additional insight by showing that most practitioners in Port Harcourt stop their analytics at the descriptive stage. A limitation of lack of capability in the identification and application of appropriate metrics among the respondents was also identified.

2.18.3 Human Capital Analytics in Zimbabwe

A research study by Malindadi (2015) revealed that Public Service Commission was using a manual system, and it emerged that some respondents were quite comfortable with the current system. Others also hinted that though they appreciate the essence and benefits brought about by an HRMIS, the government cannot implement such a system due to financial constraints. A similar study by Makwinja (2015) on three parastatals ZETDC, ZIMRA, and Tel-One revealed that all three organizations concur that they did not benefit significantly from HCIS. Although respondents at ZIMRA believe that the current HCIS had an impact on human capital management at their organization, however, acknowledge that the organization did not benefit significantly from the HCIS. Even though ZETDC, ZIMRA, and Tel-One concur that their organizations have not benefited significantly from HCIS they still acknowledged that there were some benefits of HCIS at their organizations. The major benefits from HCIS which were universally evidenced at all three parastatals were (85.2%) more security of data, (75.2%) improved communication, and (70%) improved decision-making which are essential for human capital management. This is in line with Ball (2005) who postulates that since the system deals with employees' sensitive data, it would be prudent to ensure data security while transferring information from one place to another. Additionally, Armstrong (2006) highlights that effectively implementing HCIS would also enhance communication between employers and employees and build a strong relationship with unions and management committees. Some of the other lesser benefits of HCIS to ZETDC, ZIMRA, and Tel-One include helping in achieving company objectives as well as providing a competitive advantage.

It was also revealed that the major benefit of HCIS mainly evidenced at ZETDC as compared to the other two parastatals was improved decision-making. While the benefit mainly evidenced at ZIMRA was improved security of data and at Tel-One the main benefit they evidenced was a competitive advantage. The research also revealed that the key success factors to the implementation and effective use of HCIS were not evidenced at the three parastatals. The main key success factors that were lacking were top management support, adequate training, support for the human capital department, user involvement participation, and good communication. This is contrary to McElroy (2011) who posits that successful implementation of a human resource information system relies on the support of top management, the support of the information technology department, the involvement of human capital experts, support of human capital staff, computer knowledge of human capital staff and human capital information system training.

Furthermore, each of the three parastatals had a key success factor that was mainly inclined to their organization. At ZIMRA the key success factor which was lacking was adequate training for HCIS users, while at ZETDC it was user involvement participation and Tel-One top management support. Seventy percent(70%) of respondents from ZETDC agreed strongly that one of the factors hindering the successful implementation of HCIS at their organization was low key user involvement during HCIS implementation compared to 47.2% from Tel-One and 19.6% from ZIMRA who also shared a similar view. The results indicate that of the three parastatals low key user involvement during HCIS implementation was a major hindering factor in the successful implementation of HCIS at ZETDC as compared to Tel-One and ZIMRA. Ninety-eight (98.1%) of respondents from ZIMRA strongly agreed that one of the factors hindering the successful implementation of HCIS at their organization was a lack of understanding of HCIS among users. Furthermore, Tel-One and ZETDC also had a high number of respondents who also strongly agreed that a lack of understanding of HCIS among users is a major hindering factor to the successful implementation of HCIS at their organization. However, these results indicated that ZIMRA has got such a high percentage as compared to Tel-One and ZETDC who concur that the lack of understanding of HCIS among users has been hindering the successful implementation of HCIS.

Hence it means the three parastatals' lack of understanding of HCIS among users was a major hindering factor to the successful implementation of HCIS.

Ruziwa (2015) reiterated that business leaders are looking to HR data for evidence of HR's value-adding capability and capacity to address challenges being faced by their respective organizations. HR analytics has the potential to help the HR Practitioner drive real value creation in organizations. Zimbabwean organizations are being faced with the reality that amongst the four pillars in a well-balanced scorecard namely; Financials, Customers, Internal processes, and People, the first three pillars cannot in any way be attained if the People aspect is not addressed properly. Connecting HR data with the strategic objectives of the business can help HR managers to demonstrate the return on investment (ROI) of HR. Organizations that follow good practices should have up to date, clearly defined data that is robust and of high quality and communicate it to the business. The HR Practitioner can make a difference in driving and underpinning the organization`s dreams, mission, values, and goals. The key to achieving this is none other than HR analytics. HR analytics enables better decision-making by providing an organization with insights about the workforce and the HR policies and practices that support them. Analytics may be used to look at the traits of the workforce, in particular, its human capital: the value of individual knowledge, skills, and experience of individuals and teams.

HR analytics enables the Board of Directors and teams in the organization to understand more about the people in their organization, how they are performing, and how they are creating value for the organization. In turn, this enables HR practitioners and business leaders to make better business decisions. Ruziwa recommends that HR functions should look to attract new talent into the profession from across a broad selection of functions and backgrounds, including finance, marketing, and operations. New graduates to the profession should come from highly numerical or statistical disciplines, such as psychology, sociology, or engineering. With new disciplines entering the profession, mentoring and cross-functional relationships should be brokered between HR and business partners, to build new knowledge and develop a strong understanding of human resources. HR professionals to learn and be able to apply analytical skills at every level in their careers.

Junior-level professionals coming out of colleges and universities should be provided with mentors and senior managers inside and outside of the function to understand HR analytics and the value of HR data to the organization.

Industrial Psychology Consultants(IPC) (2016) carried out a research study on the use of psychometric tests to predict road traffic accidents (RTA) at a local company in Zimbabwe. The main objective of the research was to ascertain the psychometric attributes that can be used to identify if an individual is a good or bad driver. The study revealed that the effect of accidents is grave, it impacts the drivers, organizational property, insurance rates, and the vehicles they operate. Fifty-four (54) drivers were tested using different psychometric tests to predict superior driving performance for new hires. The Fitness To Drive Plus Vienna Test System was used. Each driver's test results were then matched with his/her record of road traffic accidents from 2014 to 2015. This allowed the researchers to build a logistic regression model (using psychometric results and accident records) that distinguishes good drivers from bad drivers. The logistic regression model that was subsequently built was meant to quantify a driver's proneness to accidents using their Psychometric Test scores. Key findings established that psychometric attributes of an individual can be used to predict proneness to road traffic accidents. The built logistic regression model that distinguishes drivers who had a road traffic accident record and drivers who did not have a record had an accuracy rate of approximately seventy-two percent (72%).

Concentration and Reactive Stress Tolerance dimensions had a statistically significant relationship with road traffic accident records. There was no significant evidence in the data analyzed to suggest that holders of a Defensive Driving Certificate (DDC) are less prone to accidents than non-holders. In other words, there was no significant evidence to suggest that holders of a DDC are better drivers than non-holders of a DDC. The age of a driver and the number of years an individual has had a driver's license had fairly significant relationships with the number of RTA. In other words, older and more experienced drivers are likely to have fewer accidents than younger and less experienced drivers.The Fitness To Drive Plus Vienna Test had five key areas of assessment which were included in the logistic regression model.

Concentration is a special function of attention, namely selective attention. In driving this is called on every time that a stimulus needs to be shielded from other stimuli and concentration needs to be shifted from one stimulus to another, for example when approaching an uncontrolled intersection. Accident analysis revealed that the majority of recorded traffic accidents are attributable to inattention. Reactive Stress Tolerance involves the individual's ability to react quickly and accurately even when under stress. From the perspective of traffic psychology, a high level of stress tolerance is particularly necessary for stressful situations, such as those encountered by professional drivers driving in large cities (Burgard, 2004). Driving performance deteriorates as mental workload increases(ibid). Peripheral Perception is the perception of objects and stimuli outside the visual fixation point. Peripheral perception is needed, for example, to notice vehicles or people appearing from the side. In the literature on the visual aspects of driving (Rockwell *et al*., 1977; Hartmann, 1980), peripheral perception is discussed mainly in connection with the estimation of speed, control of the vehicle, and monitoring of the driving environment. As peripheral perception functions are an important aspect of driving, it is assumed that deficiencies or failures of peripheral perception are a major cause of accidents. Reaction Speed is the time that elapses between stimulus presentation and the start of the mechanical response movement.

A high reaction speed (short time) means that the respondent is good at responding with appropriate speed to relevant stimuli or stimulus constellations. Motor Speed-this score provides information about the respondent's speed of movement. A high motor speed (short time) means that the respondent is good at implementing planned action sequences with appropriate speed in reaction situations.

From the literature above, it was established that Psychometric profiles can be used to identify a driver's proneness to a road traffic accident with high accuracy. This implies that without any prior road traffic accident record, an organization can use appropriate psychometric tests to decide whether or not it should hire a driver or machine operator in general. The same approach can also be used to identify training needs among drivers who are already part of the organization. If the model has identified a certain driver's road accident risk as too high, the driver may be reassigned to other areas of operation in the organization.

Doing this will reduce the costs incurred as a result of accidents. Such costs include higher insurance premiums, repairs that hasten wear and tear, lost productivity, both client and company property damage, loss of business or clients, and even loss of lives. Demographic variables such as driving experience can be misrepresented by prospective drivers. For this reason, psychometric tests can be used for recruitment purposes. They have the advantage of being objective and cannot be misrepresented. In data exploration, it was noted that holders and non-holders of a Defensive Driving Certificate bare the same road traffic accident risk. This affirms the approach that the use of psychometric tests in HR analytics is highly recommendable (Nguwi, 2016).

i. **Achieving an optimum staffing level**

Another HR analytics case study in 2016 by IPC was about reaching optimum staffing levels. A large mining company in Zimbabwe was concerned about losing money because of over or understaffed departments. The experts took an interesting approach to analyzing under and over-staffing. They took the number of employees of a business unit and compared this to the business activity of this same business unit, measured over seventeen quarters. The relationship between the number of employees and business activity was strong with an R squared of 70.34%. This means that 70.34% of the business activity could be explained by the number of employees. By plotting these two dimensions, the team was able to identify the departments that were overstaffed and understaffed. Excess employees were retrenched. It turned out that the break-even point of retrenchment costs was only two months, in month three, the company was already saving money. Retrenched employees could also be relocated to similar roles in understaffed departments.

The research findings above give rise to a very important business case. By identifying the key duties carried out by employees in each role, Human Resources Practitioners can make better decisions regarding whether they should hire, maintain or downsize their staff complement. The use of statistical techniques in establishing the link between business activity and staffing levels brings objectivity to the decision-making process. Furthermore, the process of monitoring headcount is not a one-time exercise. A practitioner should continuously monitor staff complement as business activity fluctuates to ensure that employees do not overwork due to under-staffing or pay unnecessary labor costs due to over-staffing.

The above findings in the empirical literature review were partly confirmed by this researcher but had to place this research in a different context to realize new findings and conclusions.

2.19 Research Gap

This study was performed to investigate factors impacting the adoption of human capital analytics among human resource professionals in Zimbabwean state universities. Studies cited herein were conducted in developed countries where business contexts and challenges differ from those in developing countries. The studies in developed countries (Vargas, 2015; Aletaibi, 2016; Bahuguna *et al*., 2023) revealed that the current level of use of HRIS is affected by a lack of customization and a unified system, inadequate training, poor system, poor service quality and hindrances to the use and implementation of HRIS. Adoption factors impacting human resource analytics among human resource professionals are not only in the hands of the HR professionals but to some extent, the organization as well. Another study conducted in the Netherlands revealed a low maturity of organizations regarding HR analytics. Furthermore, studies conducted in the United States of America revealed that HRA is a value-adding tool that improves company performance by using data to support decision-making, thereby reducing costs and improving the quality of management decisions(Etukudo, 2019).

Therefore, this study set out to assess adoption factors influencing human capital analytics among human resource professionals in Zimbabwean state universities. Zimbabwe is a developing country and the area of study has not been directly explored as shown in the reviewed literature above. The empirical studies cited above were conducted between 2013 and 2019, this study was conducted in the year 2023, thus the existence of a time bound gap. This is a period of almost eight years afterward since other identified research was undertaken. As such, the researcher suspected that some variables could have changed due to time factors and spontaneous changes in economic and political conditions prevailing in the country. Hence, the need to find out more about this aspect of adoption factors impacting human resource analytics among human resource professionals in state universities in addition to the existing body of knowledge in the area being investigated.

All these researches were conducted in different geographical locations which include the United States of America, Netherlands, Saudi Arabia, Kenya, South Africa, Ghana, Nigeria, and Tanzania. There are vast tracts of land that separate the indicated study places and this country. Therefore, the researcher undertook his study in Zimbabwe using different respondents from Zimbabwean state universities to close population and geographical gaps.

Chadwick, Bahr, and Albrecht (1984, p.31) point out that there are more than three kinds of problems that stimulate social research: “problems with policy, problems of social philosophy, and problems with developing scientific disciplines”. No single study has investigated the use of human capital analytics in state universities in Zimbabwe at a larger scale. This study attempted to bridge that gap to contribute to the development of scientific discipline which is under-utilized in Zimbabwean state universities. Furthermore, the study is an extension to previous studies undertaken at the international level in countries like the United States of America (Vargas, 2015; Samson, 2018; Bahuguna *et al*.,2023), and Saudi Arabia (Aletaibi, 2016). African countries such as Kenya (Midiwo,2015), Tanzania (Mushi,2014), and Zimbabwe (Makwinja, 2015; IPC, 2016). Although similar studies have been carried out, there are a relatively small number of aspects in the Zimbabwean context, as studies focused more on the impact of information technology on human capital management in parastatals excluding state universities. Other research was conducted by a consulting firm with special attention to transport and mining organizations.

Rather than taking a holistic approach to all types of human capital analytics, the studies concentrated more on descriptive analytics. Therefore, this study concentrated on the adoption level of all types of human capital analytics thus, descriptive, predictive, and prescriptive analytics, and proposed an HCA implementation framework for public universities. Even though this study used tools, techniques, and theories that were previously used in other studies, the outcomes were specific and original to Zimbabwean state universities' context. There was limited empirical and peer-reviewed literature on HRA. Recent results (Bahuguna *et al*., 2023) indicate that there are less than two hundred journal articles discovered in reputable journals published so far.

Nevertheless, the available literature provided useful insights into the rationale and logic behind HRA and the accounts of companies that have implemented HRA successfully. Still, as noted by Marler and Boudreau (2017) most of the literature on HRA is not empirical and not based on standard scientific qualitative research protocols. Most of the literature was case studies for descriptive and definitive purposes rather than for inductively identifying relationships between HRA constructs and business performance. Evidence of the efficacy of HRA is limited; most of the available literature was published or sponsored by consultants with a commercial interest in the HRA market. It was observed that most of the available case studies focused on the application of HRA in a narrow HR domain, mostly recruiting or turnover prediction. Another gap in the literature was that most of the articles did not clarify the praxis of HRA nor specify a process for implementing HRA to reap the proposed competitive advantage. The available literature focuses on the normative subject of what should be accomplished regarding HRA rather than the interpretive and analytical issues of how to apply HRA, the expected results, and in what contexts.

The HRA praxis would have been concealed in the literature for trade confidentiality and while the literature creates interest in HRA, HR managers searching the literature would not get the information required to implement HRA. This study sought to provide practical information regarding strategies HR managers may use to implement HRA to reduce these gaps in the academic and professional literature on the topic. Human capital analytics and the associated theories with their genesis in the west are not suitable in the context of developing countries with cultural and social set-ups vastly different from those of the west. The question of how and why human capital analytics, despite its genesis in the west, has been taken up and adopted by HRM professionals and relevant actors in the field, such as academics in business schools and practitioners in business organizations, is still under-explored. Hence, this thesis sought to fill this lacuna by investigating factors impacting the adoption of human capital analytics within the context of Zimbabwean state universities.

2. 20 Chapter Summary

This chapter looked into various views of researchers at international, regional, and local levels regarding adoption factors influencing human capital analytics among human resource professionals in Zimbabwean state universities.

Human capital analytics have mostly positive consequences for employees and employers if properly implemented and utilized. Four theories that guided the study were also discussed, these are the TAM model, Kotter change management, Diffusion of Innovation, and the resource-based view theories. Additionally, an alternative model TOE was chosen *a priori* to compare with the results on the tested theory. The researcher employed the 5Cs of writing a literature review that is, citing, comparing, contrasting, critiquing, and connecting the literature to their study (Callahan, 2014). The foregoing literature review reflects the challenges resulting from the lack of a standard definition and framework for HRA. Despite the inconsistency of HRA definitions, scholars and practitioners have developed standard classifications of HRA. Scholars and practitioners classify analytics into three levels; descriptive, predictive, and prescriptive. This state of affairs emphasizes the need for scholarly research in this area and developing standards for HRA. Despite the promise of HRA and the benefits identified in the literature, the uptake of HRA remains low and mainly focused on descriptive analytics. The literature above revealed a theme indicating HRA is context specific. In analyzing data, HR managers require a clear understanding of the business, operational environment, and other contextual factors as these have a bearing on data interpretation results. Another common theme in the literature is the influence of organizational culture on HRA. The next chapter concentrated more on the research methodology used by the researcher.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The author observes, using Panday and Pandey (2015), that research methodology refers to the precise procedures or strategies used to find, select, process, and analyze material regarding a research topic. In this chapter, the researcher investigates the methodological viewpoints that underpin the entire investigation. The researcher explained why the research philosophy, research strategy, research design, target population, sample size, and sampling procedures used were thought to be most suited to provide answers to the identified major research topic. It also justified the study's research instruments, data collection techniques, data analysis and presentation methodologies, reliability, validity, and ethical concerns.

3.2 Research philosophy

This research study was guided by the positivism philosophy. It is a philosophical system founded by Auguste Comte, remarked Wilson (2010). This philosophy is concerned with positive facts and phenomena and excludes speculation upon ultimate causes or origins (ibid). In positivist studies, the researcher is independent of the study and there are no provisions for human interests within the study (Leedy & Ormrod, 2015; Tsouroufli *et al.*, 2021) . Positivism is an attractive philosophy because it affirms the value of science and maintains a strong distinction between true and false (a distinction that many other philosophies muddy up). Positivism relies on quantitative data that positivists believe is more reliable than qualitative research(Bless *et al.*, 2014). The focus of the study was on getting information about human capital analytics and adoption factors and not necessarily the qualitative aspects of employees' feelings. This study could be more of groundwork research for future research hence the focus on "how what, how many" and not on "why.' This allowed the researcher to have an objective perspective and remain independent of the research thereby ensuring that future researchers have the opportunity to replicate the findings of the study to some degree if all things remain the same. Using the positivist research philosophy, the researcher was able to obtain a large sample from the target population to enhance the reliability of the results.

3.3 Research Strategy

The research study employed a quantitative research strategy. This is a systematic investigation of phenomena by gathering quantifiable data and performing statistical or computational techniques. An example of quantitative research is the survey conducted to understand the amount of time a payroll officer takes to attend to pay queries when an employee walks into the salaries office. An employee satisfaction survey template can be administered to ask questions like how much time a payroll officer takes to attend to pay queries, how often an employee visits the salaries office, and other such questions. The results achieved from this research method are logical, statistical, and unbiased. The searcher adopted a deductive approach for this study. Bless, Higson-Smith, and Sithole (2014) stated that by using the deductive criterion the researcher seeks to generate findings and generalize from the sample to the population. The deductive approach offers the following advantages: the possibility to explain causal relationships between concepts and variables, the possibility to measure concepts quantitatively, and the possibility to generalize research findings to a certain extent (Wilson, 2010; Creswell, 2013; Neuman, 2014). In this study, it was therefore easy to measure the relationship between human capital analytics and adoption factors. The findings can be generalized to the majority of the human resource professionals in the host organizations and other similar institutions in the country and beyond.

3.3.1 Rational for research strategy

The chosen research strategy was used by past researchers at international, regional, and local levels. A similar study by Samson (2018) in the United States of America (USA) used the quantitative research methodology and the positivist research paradigm. Data were collected from a sample size of 383 executives from large public and private sector organizations in the United States of America, India, and Australia using the online structured questionnaire. Data analysis was done utilizing the statistical package for social sciences (SPSS). The Samson (2018) study was limited to executives and middle managers as they had more knowledge of organizations' strengths and weaknesses. Kiran *et al.*(2023) research study in India investigated the influence of human resource analytics on organizational performance in the service industry. Similarly, the researchers used same context methodology (questionnaire survey and stratified random sampling technique was adopted to select 300 respondents).

Ukandu, Iwu, and Allen-lle's (2014) research study in South African tertiary institutions used a combination of both qualitative and quantitative research methods. This research design enabled researchers to have a better understanding of a study from a subjective and objective point of view since it involved the use of in-depth interviews and questionnaires. The data collected were analyzed using the statistical package for the social sciences (SPSS).

Makwinja's (2015) research study at Tel-One, ZIMRA, and ZETDC on the impact of information technology on human capital management used the quantitative research method. The researcher chose the positivist approach as the study was a quantitative one. Data collection tools used were structured questionnaires and documentary reviews. The study used an analytical descriptive survey design, adapted the Krejcie and Morgan (1970) table to select the appropriate sample size of 373 respondents from the total population of 10 600 management and staff at ZIMRA, ZETDC, and Tel-One at a 95% confidence level. The researcher used simple random and cluster sampling methods in selecting all the potential respondents. Data analysis was done using the statistical package for social sciences (SPSS) version 21.

The four research studies cited above dealt with human resource professionals in private sector companies and public universities as the research subjects respectively. The apparent convergence of both studies is that they made use of a positivist approach and quantitative research methods. Data collection tools like questionnaires and documentary reviews and data analysis packages of SPSS were common among both types of research. This researcher followed the Makwinja (2015), Samson (2018) and Kiran *et al.*(2023) research study quantitative research method and differed on the research design which was a descriptive survey. The current researcher used the correlational research design. Correlational research designs attempt to explore and observe the relationships among variables and the variables are not controlled. The design was convenient to this study as it allowed the researcher to explore and observe the relationship between human capital analytics and adoption factors as the variables. This study followed the same strategy by Makwinja (2015) and Samson (2018) of using the structured questionnaire and document review as the main data collection tools but differed on the research design in an attempt to close the methodological gap.

3.4 Research Design

As propounded by Neuman (2014) , the author views research design as a general plan adopted by a researcher in answering the research questions. To achieve the objectives of this study the researcher used the explanatory correlational research design. Correlational research design attempts to explore and observe the relationships among variables and the variables are not controlled (ibid). The design was convenient for this study as it allowed the researcher to explore and observe the relationship between human capital analytics and the adoption factors. The design is popular both in business and management research since it answers the questions of who, what, where, and how much in the study (Saunders, Lewis & Thornhill, 2009). It allows researchers to determine the strength and direction of a relationship so that later studies can narrow the findings down and, if possible, determine causation experimentally. Hence the benefit of correlational research is that it opens up a great deal of further research to other scholars. Correlational research allows researchers to collect much more data than experiments. Another distinctive feature of this method is that in a review of variables with a correlational research study neither one of the variables goes through a manipulative process. The data gathered from a correlational research study can come from either naturalistic observation or archival data. Thus the research design uses two different data collection methods which can complement the weakness of the other (ibid). The use of collected data from previous research efforts is straightforward and gives researchers access to specific points that can lead to a greater understanding of the potential variables involved in each situation. The results from correlational research are more applicable because a correlational research study occurs in real-life situations, and the data that gets gathered from this work is typically more applicable to everyday encounters. This advantage creates the possibility of discovering new relationships existing between phenomena that do not seem to have existing connections (Bhattacherjee, 2012). That process helps to discover more about the world and specific situations than if other research methods were used. The correlational research design is thus suitable for studying adoption factors influencing human capital analytics among human resource professionals in Zimbabwean state universities.

3.5 Target population

A study population can be defined as participants who present significant knowledge to a research study (Leedy & Ormrod, 2015; Bryman & Bell, 2015b). The population frame of this research consisted of three thousand, eight hundred and eighty-eight (3 888) respondents. These were human resource professionals, general staff members, and senior management staff from five state universities in Zimbabwe. The choice of the population emanates from the reasoning that state university human resource professionals usually have a common and binding characteristic in terms of human resource practice. General staff members are the consumers of human resource services within state universities and therefore, are important stakeholders in the adoption of human capital analytics. The team of senior management was included as policymakers and resource allocators who influence the adoption level of human capital analytics.

Table 1: Sampling Frame

Population	Midlands State University	Zimbabwe Open University	Chinhoyi University of Technology	Lupane State University	Manicaland State University of Applied Social Sciences	**Grand Total**
Senior Management	6	7	6	4	1	**24**
HR Staff	13	13	11	8	6	**51**
Consumers of HR Services	1738	762	863	277	173	**3813**
Total	**1757**	**782**	**880**	**289**	**180**	**3888**

Source: Field Survey, 2021

3.6 Sample size

A sample is simply a subset of the population and the concept of a sample arises from the inability of researchers to test all the individuals in a given population (Kothari, 2004). The sample according to Pierce (2009) must be representative of the population from which it was drawn and must have a good size to warrant statistical analysis. Sample size determination for explanatory correlational studies is based on sampling confidence intervals and margin of error (Chikoko&Mhloyi, 2014). The sampling Confidence interval (CI) tells us how confident we are that if the study was repeated again and again, we would get the same results. If the confidence level is 95%, we would get the same results in 95% of the cases. The margin of error is a percentage that tells the researcher how much you can expect survey results to reflect the views of the overall population. The smaller the margin of error, the closer you are to having the exact answer at a given confidence level (ibid). A sample size of 419 employees identified from the five state institutions' human resources departments, calculated using the Raosoft calculator was used to enable the collection of data for this study wherein the confidence interval is 95% and +-5% margin of error. Further fifteen (15) key informants were selected through snowball sampling to make a total of 434 research subjects for this study.

Table 2: Sample Size Calculation

Stratum	**A**	**B**	**C**	
Population Size	24	51	3813	
Final Sampling Size Results obtained by use of Raosoft Calculator	23	46	350	**419**

Source: Field Survey, 2021

3.6.1 Sample size justification

Many researchers (Ross, 2004; Yıldırım & Şimşek, 2006) suggest that if parametric tests are to be employed 30-500 research subjects would be the necessary sample size.

The researcher used the Pearson correlation coefficient, one-way analysis of variance, linear regression, and structural equation modeling. Parametric tests were used because they have more statistical power and they enabled the researcher to detect significant differences when they truly exist. These numbers (of 30-500 study subjects) are valid for the selection of a sample using random sampling techniques and, in this case, the researcher used the stratified random sampling method. Each of the parametric tests mentioned has a non-parametric analog. For example, the non-parametric analog of the t-test for categorical data is the chi-square which was used as well. The above sample size was considered valid as previous researchers on HRIS generated acceptable results using similar range sample sizes. Ikhlas and Al-Shqairat (2010) in their survey of the implementation of human resource information systems in Jordanian Universities generated a sample size of 200. Burbach and Dundon's (2005) study aimed to assess the strategic potential of human resource information systems to facilitate people management activities in the Republic of Ireland, using a sample size of 210 respondents. Another study conducted by Delorme and Arcand in 2010 aimed to elaborate on the development of the roles and responsibilities of HR practitioners from a traditional perspective to a strategic perspective and employed a sample size of 198 respondents. Makwinja (2015) used a sample size of 373 respondents, meanwhile, Samson (2018) used a sample size of 383 for a similar study in the USA. Thus, the researcher saw it prudent to settle for a slightly higher sample size than the similar previous scholars.

3.7 Sampling methods

In order to draw valid conclusions from this research study, the researcher chose a representative sample of the whole study population through a probability sampling method and snow ball sampling method to select key informants (McCombes, 2023).

Stratified Random Sampling

It is a probability sampling method wherein the researcher divides the entire population into different subgroups or strata, then randomly selects the final subjects proportionally from the different strata. The most common strata used in stratified random sampling are age, gender, socioeconomic status, religion, nationality, and educational level, asserts(Bless *et al.*, 2014b; Cooper & Schindler, 2014).

A stratified random sampling procedure was used by this researcher because of the need to highlight specific subgroups within the population in this case the human resource professionals in the HR departments, general staff members, and senior management staff. The researcher also had to employ stratified random sampling because he sought to observe existing relationships between the groups in terms of human capital analytics and the adoption factors. Through this technique, a researcher can have a higher statistical precision compared to simple random sampling.

3.8 Research Instruments

Research instruments are tools developed by researchers to achieve their stated objectives when carrying out a research study (Edekin, 2012). In other words, research instruments are designed tools that aid the collection of data for analysis. The research study used a structured questionnaire, document review and key informant interviews as the instruments for data collection. It is important to note that secondary data in some instances may not be applicable and accurate because of the ever-changing and dynamic environment. This compromises the quality of the decisions made on its basis, thus the need to use both primary and secondary data so that they will complement their weaknesses (ibid). The researcher made use of both primary and secondary sources of data as method triangulation. Method triangulation is a process in which the researcher uses two or more research methods to investigate the same phenomenon. This can be done either sequentially, that is, one method after the other, or at the same time (Neuman, 2014). After collecting primary data using the structured questionnaire and key informant interviews, this researcher then collected and analyzed secondary data. The major benefit for the researcher and scholarship, in general, is that findings are likely to be much more convincing and accurate if based on different sources of information (Tichapondwa, 2013). The primary data collection tools were developed after a careful study of past researches (Bersin, Houston, Kester, 2014; Vargas, 2015; Kaur & Fink, 2017; Kremer, 2018; Boakye & Lamptey, 2020), and the questions therefrom were modified to suit the current study. The Resource-based view theory and Technology Acceptance Model (TAM) also assisted in coming up with the key research questions for the study. When formulating the questionnaire, the researcher attempted to mitigate possible response bias and lack of completion by following some of the guidelines below;

- ❖ Avoiding double-barreled questions and ambiguity

- ❖ Avoiding making big assumptions

- ❖ Avoiding very lengthy/ difficult questions.

3.8.1 Structured Questionnaire

Collins (2010) remarks that a questionnaire is a research instrument consisting of a series of questions used to gather data from respondents. Questionnaires provide a relatively cheap, quick, and efficient way of obtaining large amounts of information from a large sample of people (Saunders *et al,* 2009). Data can be collected relatively quickly because the researcher would not need to be present when the questionnaires are to be completed (ibid). This is useful for large populations which are far away from each other like in this thesis. In this case, the respondents were found in different parts of the country like Harare, Gweru, Manicaland, Chinhoyi, and Lupane. Questionnaires can be an effective means of measuring behavior, attitudes, preferences, and opinions. Questionnaires also effectively measure the intentions of relatively large numbers of subjects more cheaply and quickly than other methods, observed Babbie (2013).

3.8.2 Key Informant Interviews

Key informant interviews are vital in research when quantitative data collected through other methods need to be interpreted (Kumar, 1989; Blanco & Pozo, 2014; O'Leary, 2014; Cherinet, 2018). Structured questionnaire and documentary review used by the researcher have other points of rigidity in the context of data interpretation. Thus, the utilization of this instrument in the data collection process to provide a broad base for interpretation and authenticity of the research findings. The researcher was keen to interview selected key informants to shed more light on the factors impeding full adoption of human capital analytics in Zimbabwean State universities. Persuaded by the primary purpose of the study which was to generate suggestions and recommendations leading to the development of a model, key informant interviews were found to be suitable. Borrowing from scholarly advice (Carter, & Beaulieu, 1992; Mountain States Group, 1999), the researcher chose the telephone interviews technique to obtain information from each of the key informants. Guided by some insider knowledge, the researcher obtained three appropriate individuals as key informants. A snowball approach was taken to increase the number up to the expected level.

The researcher identified the target population for key informant interviews as immediate past employees in the Human resource and accounting departments of the identified five Zimbabwean state universities. The snowballing exercise of possible key informants who were knowledgeable and closely linked to the population of interest was done. The exercise yielded fifteen (15) key informants and this group had a diverse mix of key informants in order to ensure a variety of perspectives. Specifically, the key informants group was made up of former registrars, salaries officer, human resources officers and clerks from the universities identified. Telephone interviews were found to be the most convenient and least time-intensive way to interview busy key informants. A structured telephone key informant interview tool to address primary research questions was done in order to get all the valuable information. The interviewer obtained informed consent from key informants to audiotape the interview such that time management was possible. Telephone interviews lasted for fifteen (15) minutes to accommodate busy schedules of some research subjects. The validity of key informant interviews findings was increased by obtaining feedback from a few key informants. Mainly, this was done by preparing a brief summary of the findings and shared it with the available key informants. Key informants were given an opportunity to clarify points they feel were misunderstood or ignored, question the reasoning behind findings, and present their arguments and opinions. No changes were made on the results document because no points were misunderstood. A sample of validated key informant results form part of appendices to this thesis.

3.8.3 Document Review

Document review is a process used to collect data after reviewing existing documents (Creswell, 2013). It is an efficient and effective way of gathering data as documents are manageable and are a practical resource to get qualified data from the past. Apart from strengthening and supporting the research by providing supplementary research data, document review has emerged as one of the beneficial methods to gather quantitative research data (ibid). Under this document review, official, ongoing records which were analyzed include, annual reports, policy manuals, and human resource activities in the universities. The value of secondary analysis during this DPhil study is that it helps to clarify the analysis queries. As Collins (2010) noted, this allows the investigator to derive vital facts and patterns from the previous analysis.

Housden (2005) noted that secondary information is often low-cost or free of charge, and saves effort and time. Documents can be read and reviewed multiple times and remain unchanged by the researcher's influence or research process as observed by Bowen (2009). In evaluating documents, the researcher followed the eight-step process offered by O'Leary (2014) as remarked:

1. Gather relevant texts.
2. Develop an organization and management scheme.
3. Make copies of the originals for annotation.
4. Assess authenticity of documents.
5. Explore the document's agenda and biases.
6. Explore background information, for example, tone, style, and purpose.
7. Ask questions about the document for example, who produced it? why? when? type of data?
8. Explore content.

Step eight refers to the process of exploring the actual content of the documents and they are two major techniques for accomplishing that (O'Leary, 2014). One is the interview technique wherein the researcher treats the document like a respondent or informant that provides the researcher with relevant information (ibid). The researcher "asks" questions and then highlights the answer within the text. The other technique is noting occurrences, or content analysis, where the researcher quantifies the use of particular words, phrases, and concepts (O'Leary, 2014). Essentially, the researcher determines what is being searched for, then documents and organizes the frequency and number of occurrences within the document. The information is then organized into what is related to the central questions of the research(ibid). The researcher in this case employed the interview technique and document review was also used by Makwinja (2015) and Samson (2018) research studies.

3.9 Data collection procedures

The researcher sought permission from the University authorities to carry out the research study. This was done through a written application letter containing information about the researcher as well as the thesis topic. A sample of such application letters is attached as an appendix to this thesis. The researcher distributed the questionnaires personally to the selected respondents after explaining the purpose of the research and presenting the letter of authority to them to get assurance that the research was legal. Human resources personnel escorted and assisted in identifying offices where students on attachment, part time staff, and permanent staff were deployed. The researcher collected the questionnaires after two days to allow enough time to respond. This is called the delivery and collection way of administering questionnaires (Ross, 2004; Cooper & Schindler, 2014; Chikoko & Mhloyi, 2014). The delivery and collection processes were done during tea and lunch breaks to avoid interference with work processes.

3.10 Data analysis and presentation methods

Data analysis was done using a variety of descriptive and inferential statistics. Descriptive statistics used were cross tables and frequency tables. The inferential statistics used were One-way analysis of variance (ANOVA), regression analysis, Pearson correlation coefficient, exploratory factor analysis and structural equation modeling (Babbie, 2013). A statistical package for the social sciences (SPSS) version 26, Jefreys's Amazing Statistics Program (JASP 0.16.4.0) software and Micro soft excel were employed to analyze collected primary data for this research.

3.11 Reliability

Reliability can also be defined as the degree to which an assessment tool produces stable and consistent results. In short, it is the repeatability of the measurement (Babbie, 2013). Chikoko and Mhloyi (2014) described reliability as the extent to which a test produces similar results under constant conditions. To increase the reliability of the data, the researcher in-house pre-tested the measuring instrument. Casper, Peytcheva, and Cibelli (2011, p. 1) define pretesting as "including a sequence of activities intended to evaluate the capacity of a survey instrument to collect the desired data, the capabilities of the method chosen to collect data and the overall appropriateness of the field procedures". In this study, in-house pretesting was undertaken to ensure that at face value, the questionnaire measured what it intended to measure.

This was achieved by presenting the draft questionnaire to a panel of experts in the research field during the compulsory research week held at the Chinhoyi University of Technology. The data collection tool was also submitted to thesis supervisors to assess the relevance of the questionnaire items. A copy of the pretesting instrument forms part of the appendix of this thesis. With input from the in-house reviewers, minor changes were made to ensure that the items were not very difficult for respondents by providing definitions of key terms like human capital analytics and human resource information systems and adding answering instructions to respondents. In-house reviewers also recommended that the questions be broken down into scales representing each construct being measured.

3.11.1 Pilot Testing

Pilot testing is the procedure of investigating the research instrument to be used in a research study to identify ambiguities, misunderstandings, or other inadequacies. The procedure involves gathering relevant data especially from colleagues, groups of experts, or similar populations different from the actual respondents (Zikmund *et al*, 2016). Specifically, the purpose of a pilot test is to refine the questionnaire so that respondents will have no problems answering the questions and the recording of data will be easy. Extant literature (Treece and Treece, 1982; Connelly, 2008) suggests that a pilot study sample should be 10% of the sample projected for the larger parent study. This researcher pilot-tested the questionnaire to a group of forty-two (42) respondents who were purposively selected from a similar population different from the actual respondents using the same protocols as used in the final administration. Forty-two respondents were the ten percent (10%) of 419 as the projected sample size for the main study. The main issues taken into account from the pilot study include the time taken to complete the questionnaire, the clarity or ambiguity of questions, and the ability of the respondents to handle the questions. The final decision was guided by cost and time constraints. Respondents provided useful feedback on the missing age range 18-19 years and suggested the removal of question five from the pretest instrument as it would harm the identity of respondents. It was suggested that categories like senior management, consumers of HR services, and HR professionals would work out to replace the job title aspect. The pre-tested data collection tool had thirty-nine items including the demographic section.

3.11.2 Validity

Joppe (2000) perceives validity as a tool to determine whether the research truly measures that which it was intended to measure. In other words, does the research instrument allow you to hit "the bull's eye" of your research object? Cooper and Schindler (2014) defined validity as how sound or effective a research instrument or test such as a questionnaire is. There are three different approaches to validity analysis within social science as observed by Leedy and Ormrod (2010); content validity, external validity, and face validity.

3.11.3 Content Validity

To maintain validity, the researcher did not collect data from sub-contractors employees and students on attachment within the host organizations. Validity was also ensured through methodological triangulation by the use of structured questionnaires and documentary reviews. According to McDaniel and Gates (2006), a measurement must satisfy certain criteria before it can be applied in empirical fieldwork. These criteria are: -

1. Carefully define what is to be measured.

2. Conduct a careful literature review.

3. Let the scales be checked by experts.

4. The scale has to be pre-tested.

To ensure the content validity of this research instrument, the criteria proposed by McDaniel and Gates (2006) were adopted by the researcher. Within this respect, the proposed research variables (human capital analytics and adoption factors) were developed and defined carefully through a deductive process from the literature review of past related studies and the guiding theory, resource-based view theory. Moreover, the research questionnaire and measurement scales were examined by the researcher's supervisors as well as academic research experts from the Chinhoyi University of Technology during compulsory research week sessions. Within this examination process, the dimensionality of the research scales and their relevance to the target population were examined. The common approach used by this researcher was the Likert-style rating scale for the primary data collection tool.

To ensure content validity the researcher made sure that all questions in the questionnaire covered all the important sections of the research topic and in particular research objectives. Based on that, the research scales within this study were considered to possess content validity since they had gone through all the needed actions and procedures to gain this validity.

3.11.4 External validity

It is the extent to which the results of a study can be generalized from a sample to a population (Priest, 2006). Establishing the external validity of an instrument follows directly from sampling. A sample should be an accurate representation of a population because the total population may not be available. An externally valid instrument helps obtain population generalizability. In these circumstances, the researcher used a stratified random sampling method to choose the sample size from the host organizations. This random sampling method has a degree of precision that allows the generalizability of results to other similar situations (Creswell, 2007).

3.11.5 Face validity

Face validity is simply whether the research instrument appears at face value to measure what it claims to (Dillman, 2012). Apart from conducting a pilot test, the researcher checked that each questionnaire was completed. The researcher also ensured that respondents had no problems understanding or answering questions and followed instructions correctly (Fink, 2005). The pilot testing research instrument used contained additional information like how long the respondents took to answer the questions, any major topic omissions, clarity of instructions, and any ambiguous questions.

3.12 Ethical considerations

Ethical considerations in research are a set of principles that guide research grand plans and practices at any level of a research study (Bhandhari, 2022). Said differently, ethics in research is concerned with the knowledge of what is right and wrong in human conduct and upholding the ethical values of research (Choga & Nyaya, 2011). From the foregoing definitions, it is evident that there are various research principles and values which need to be upheld by different researchers across various academic disciplines. Some studies involve human beings, both children and adults, and failure to protect the research subjects poses potential harm to the lives of participants.

Equally, there would be a possible violation of intellectual property if host organizations and researchers do not obtain research permission and ethical clearance. Integrity in research is important because it helps to connect science and society in terms of human rights and dignity. These principles ensure that research subjects' participation is voluntary, informed, and safe. Defying research ethics reduces the credibility of any researcher's findings because it is difficult for others to trust the data if the research methods are morally dubious (Bhandhari, 2022). The first definition (Bhandhari, 2022) is silent on the name of research subjects, nevertheless, research can even be conducted on animals and the same ethical principles have to be upheld, though with minor and major variations. The researcher in this study paid careful attention to possible research ethics applicable to human beings, especially invasion of privacy, informed consent, plagiarism, confidentiality and right to withdraw.

3.12.1 Invasion of Privacy

Since the study involved data collection from people, the researcher submitted a research proposal to the university postgraduate department research committee that checked the proposal. The committee checked if the research aims and research design were ethically acceptable and followed the institution's code of ethical conduct. They also checked that the research materials and procedures were up to code. Upon obtaining the research permission and ethical clearance, the researcher did not collect information that the host organizations regarded as private. The researcher also had to bear in mind that individuals have the power to decide what information they can disclose or not to disclose about other employees and the performance of their duties.

3.12.2 Informed Consent

Informed consent is an ethical principle of autonomy where the respondents can be allowed to choose whether to participate in the research or not (Creswell, 2013). The researcher obtained the consent by informing the respondents of the objectives and purpose of the research through a consent form, the method to collect data, and their contributions to the research topic, such that they would voluntarily answer the questionnaires.

3.12.3 Confidentiality

Confidentiality applied to all information provided by the respondents, by ensuring that all the information could not be revealed to third parties (Zikmund *et al.*, 2016). The anonymity and confidentiality of the respondents were protected tightly except when they consented to the release of personal information.

Anonymity was guaranteed by advising respondents not to write their names or code the questionnaires.

3.12.4 Publication of Results

The publication of results was guided by ethics and the researcher avoided panel beating the results to fit into some preconceived ideas. Data in research findings were not fabricated.

3.12.5 Plagiarism

The researcher observed this ethical code of conduct by correctly citing ideas from other authors. This was done to avoid the violation of ethical principles of justice, fairness, and integrity (Bryman & Bell, 2015). To maintain integrity in this study, the researcher cited sources according the referencing style of the study institution (Chinhoyi University of Technology Post Graduate School). In fact, the citations included quotations, paraphrasing and presenting own ideas from analysis of cited sources. Furthermore, research diary was maintained to compile list of identified sources as the thesis was being composed and plagiarism checker software was used to cross check the similarity index.

3.12.6 The Right to Withdraw

The researcher informed the respondents that they had the right to withdraw at any time through a consent form. They were not coerced or deceived to take part in the research study. During the time of field survey, no research subject withdrew from the research process.

3.13 Due Diligence Process of the study

Key steps to reduce bias were taken by the researcher and the detailed steps are described below. Major possible sources of bias were identified and possible measures employed to mitigate same.

Chapter 2-Review of Related Literature

A good scholarly survey of similar past researches is the foundation of any research project. A thorough analysis of literature was conducted, with numerous sources of literature studied in order to gain a thorough understanding of the essential topics facing the study of human capital analytics globally. The study's research objectives served as the important portions of the literature review chapter and also served as the conceptual foundation for this investigation. At the end of Chapter 2, a summary of the literature review was provided, and the knowledge gap was highlighted.

Randolph (2009:2) and Boote and Beile (2005:3) provided advice on how to perform a good literature review. The researcher strictly adhered to institutional norms when writing the chapter. The supervisor evaluated and approved the chapter.

Chapter 3 Research methodology

This chapter described the study technique in detail, beginning with the research strategy, philosophy, research design, target population, and sample size. A thorough analysis of the literature was conducted in order to create the data collection tool, which was then approved by the supervisors. The methodological portion was submitted to the postgraduate department of Chinhoyi University of Technology as a proposal and throughout chapter creation, and it was defended during required residency weeks. As a result, the methodological component of this study was deemed viable. Extensive literature sources (Ukandu, Iwu, and Allen-lle's, 2014; Makwinja, 2015; Samson, 2018; Kiran *et al.,* 2023) were consulted for the research strategy used by the researcher. Pretesting and pilot testing of the data collection tool was done before the final administration.The reliability of the instrument was assessed using Cronbach's alpha (α). This method was chosen following the recommendations of Saunders *et al*. (2009:374) and Zikmund and Babin (2007:308) that the Cronbach's α is the most frequently used technique. A careful literature review was undertaken to inform the construction of the instrument to ensure content validity. The primary data collecting tools were created after a thorough review of previous studies (Bersin, Houston, Kester, 2014; Vargas, 2015; Kaur & Fink, 2017; Kremer, 2018; Boakye & Lamptey, 2020), and the questions were modified to fit the current study. The Resource-based View Theory and the Technology Acceptance Model (TAM) also aided in developing the study's primary research topics.The developed data collection tool was separated into sections based on respondents' demographic features, scales measuring key components, and questions on a five-point Lickert scale.

Chapter 4: Results and Discussion

The importance of ethical considerations in research cannot be overstated. High ethical standards were followed to ensure that the current study's results were not skewed. This was completed prior to, during, and after data collection. Before taking part in the study, respondents were requested to complete an informed consent form. Furthermore, the researcher had no influence on the responses of the research subjects.

When respondents had difficulty comprehending particular terminology or questions, an explanation was provided without necessarily revealing the answer. Data were kept strictly confidential following the data collection process. The study was approved by the Chinhoyi University of Technology Research Ethics Committee and is included as an appendix to this paper. To achieve data source and methodological triangulation, the researcher used three data gathering technologies and three groups of respondents. The data gathering tool's reliability (structured questionnaire) was tested and confirmed to be above the required threshold. Respondents were sent key informant interview reports to validate the findings. Because of the possibility of biased interpretation, a discussion section presents a challenge to the researcher. To counteract this, the researcher anchored the discussion on the findings, which were established on the study's aims. In Chapter 2, there was also a reference to the literature.

Chapter 5: Conclusion and Implications

This section, like the discussion of results chapter, is qualitative in nature, and so has the possibility for biased conclusions and implications of the study to current body of knowledge. To address this, the researcher based his conclusions on the findings and discussion in Chapter 4. The suggestions were based on the study's findings, while the contributions to knowledge were based on the contrast between the existing literature and the findings of the current study.

Originality

To confirm the thesis's uniqueness, the researcher did a thorough scholarly investigation of previous context studies to find the gap in the present body of knowledge. The researcher had to recite the literature while citing the sources of literature when presenting the literature. The thesis was checked for similarity index using Turnitin, and proof of this is given as an annex to this treatise. The supervisors were quite helpful during the study's scrutiny procedure. They gave guidance at each level to limit the researcher's potential bias.

3.14 Chapter Summary

Chapter three of the study laid the foundation for systematic data collection and subsequent analysis. Areas covered under chapter three included; research design, study population and sample size, data collection and analysis, and the pilot study.

Ethical and protocol considerations for the various aspects of the study were also outlined. Thesis inspection techniques employed in this study were also covered. Chapter four ensues and is devoted to data presentation and analysis.

CHAPTER 4: RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

Chapter three described the research problem and methodology. This chapter focuses on the results of the present research. Main issues arising from the research objectives were relationship between level of human capital analytics adoption and the time period since state universities introduced HRIS. Human and organisational dimension factors inhibiting the adoption of human capital analytics in state universities and a predictive model for adoption of human capital analytics in Zimbabwean state universities. The presentation of results focuses on the response rate analysis, demographic profile of the respondents, reliability analysis, exploratory factor analysis, testing of hypotheses, key informant interviews and documentary review.

4.2 Response Rate Analysis

Level of response rate is an important issue in relation to validity of results, for academic credibility and integrity(Baruch, 1999). The response rate is the percentage of people who complete a survey out of the number of potential participants contacted. A high (or "acceptable") study response rate is important to ensure that results are representative of the target sample and that the data collection tools performed as intended. The survey response rate lends credibility to the research and the subsequent results. A low response rate may undermine the statistical ability of the collected data and in turn, dilute the reliability of the results. This results in the study not being indicative of the complete or a larger population. A total of 434 respondents were considered for participation in the study. Data were collected using structured questionnaire, key informant interview guide and documentary review. Out of the 419 respondents who received questionnaires, a total of eighty-five questionnaires were left blank and twenty respondents failed to respond.Thus, 314 usable questionnaires plus fifteen (15) key informants. This gave an overall response rate of 76%.

4.3 Demographic Characteristics of the Respondents

Data on the demographic characteristics of the sample are presented in this section. Employee demography can be defined as "the study of the composition of a social entity in terms of its members' attributes" (Pfeffer, 1983: 303). Demographics include such factors as gender, age, occupation, seniority, salary levels and marital status.

The researcher normally includes those factors which are assumed to have explanatory value in the research. Demographics can explain significant differences in attitudes and beliefs (Cianni & Romberger, 1995; Mor Barak, Cherin & Berkman, 1998). Lawrence (1997:2) points out that despite the important, sometimes critical role of demography, researchers often leave demographic variables "loosely specified and unmeasured, creating a 'black box' filled with vague, untested theories". While work forces have always had a degree of diversity in terms of age and skill, this diversity has grown markedly over the last two to three decades. The number of women in the work force has increased significantly, as have the proportion of different ethnic groups (Shenhav & Haberfeld, 1992). Given a diverse work force, it is reasonable to assume that differences in views and attitudes could exist, which hence, justifies examining demographics.

Table 3: Descriptive statistics of demographic variables

Gender	**Frequency**	**Percentage**
Male	161	51.3%
Female	153	48.7%
Age range of respondents		
20-30 years	22	7%
31-41 years	95	30.3%
42-52 years	116	36.9%
53-63 year	70	22.3%
64-75 years	11	3.5%
Level of Education		
O level	6	1.9%
A level	2	0.6%
Professional certificate	25	8%
Diploma	91	29%
Bachelor's degree	53	16.9%

Master's degree	104	33.1%
Doctorate	27	8.6%
Professor	6	1.9%
Respondents' job position		
Consumers of HR Services	251	79.9%
HR Professionals	42	13.4%
Senior Management	21	6.7%

N= 314

i. *Gender of respondents*

Demographic information provides data regarding research respondents and is necessary for the determination of whether the individuals in a particular study are a representative sample of the target population for generalization purposes (Hammer, 2020). Usually demographic variables are independent variables by definition because they cannot be manipulated. Therefore, in research, a thorough description of respondents allows for comparisons to be made across replications of studies. It also provides information needed for research syntheses and secondary data analyses (Bein, 2009). The presentation of data on demographic variables is in two sections, namely descriptive statistics (frequency tables) and association between variables. Demographic table presented above shows that there was male dominance as indicated by more males (51.3%) than females (48.7%) in the study sample.

ii. Age range of Respondents

Primary data revealed that age range 20-30 years had twenty-two respondents (7%), 31-41 years had ninety-five respondents representing thirty point three percent (30.3%) of the sample size.The age range 42-52 years had the highest percentage of 36.9% representing 116 respondents. Seventy respondents (22.3%) were in the age range 53-63 years and 64-75 years age range had the least number of eleven respondents (3.5%).

iii. Level of education of research subjects

It can be established from demographic table presented above that few respondents had an O level certificate of education(1.9%), two (2) respondents representing 0.6% had advanced level education and 8.0% had a professional certificate. Twenty-nine percent (29%) of the respondents were Diploma holders and 16.9% had a Bachelors degree.Thirty-three point one percent (33.1%) had a Masters degree, 8.6% a Doctoral degree and (1.9%) Professors.

iv. Respondents' job position in the organization

The table above indicates 79.9% of the sample respondents as consumers of HR services in the state universities. Thirteen point four percent (13.4%) of the respondents were HR professionals and 6.7% were senior management members of the state universities.

v. Length of service of respondents

The highest number of respondents (36.3%) had served for 11-15 years in their current organizations. There were 66 (21%) of the respondents who had served for 6-10 years, followed by 17,5% who had served for 1-5 years in their organizations, followed by fifty-two (16.6%) respondents who had served for 16-20 years in their organizations. The least category was 21 years and more length of service which had twenty-seven (8.6%) respondents.

4.4 Association between demographic variables

An analysis of association between demographic variables was done. Organizations use demographics to learn more about a population's characteristics for many purposes. This includes policy development, learning more about the generalities of a particular population in terms of technology appreciation and strategic planning (that includes better management of resources and identifying people nearing retirement age). The analyses on associations between demographic variables were performed on the following possible combinations of demographic variables: age and length of service, job position, gender and education. The results reported are only for pairs of demographic variables that were found to be significantly associated. The associations among demographic variables of the respondents were analyzed using techniques such as Cramer's *V* (*Vc*) and Spearman's rank coefficient (*rs*). The association between age range and length of service in the organization was analyzed using Spearman's rank coefficient (*rs*).

Table 4:Correlations

			age range of respondent	length of service in the organization
Spearman's rho	age range of respondent	Correlation Coefficient	1.000	.487**
		Sig. (2-tailed)	.	<.001
		N	314	314
	length of service in the organization	Correlation Coefficient	.487**	1.000
		Sig. (2-tailed)	<.001	.
		N	314	314

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

Source: Field Data (2022)

Data show that at 1% level of significance (α = 0.01), there is a significant association between age range and length of service in the organization (Spearman's rho = .487, *p* <.001).

vi. *Level of education* respondent job position in the organization*

Cramer's V is used to examine the association between two categorical variables when there is more than a 2 X 2 contingency and the above table is 8 X 3 contingency table. Cramer's V is used to understand the strength of the relationship between two variables. To use it, variables of interest should be categorical with two or more unique values per category. In this case, level of education and job position in the organization had more than two unique values per category, thus, Cramer's V is a suitable test.

Assumptions for Cramer's V

Every statistical method has assumptions. Assumptions mean that data must satisfy certain properties in order for statistical method results to be accurate.The assumptions for Cramer's V include:

For this test, two variables must be categorical. A categorical variable is a variable that describes a category that does not relate naturally to a number (Wegner, 2007). Examples of categorical variables are level of education and respondent job position in the organization as indicated in the cross-table above. Cramer's V values ranges from 0 to 1, where zero indicates no relationship and one indicates perfect association.The p-value represents the chance of seeing results if there was no actual relationship between the variables. A p-value less than or equal to 0.05 means that the result is statistically significant and we can trust that the difference is not due to chance alone. The following adjectives are used to describe the strength of a relationship for Cramer's V :

- >.5 high association
- .3 to .5 moderate association
- .1 to .3 low association
- 0 to .1 little if any association

Table 5:Chi-square Test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	107.784[a]	14	<.001
Likelihood Ratio	80.595	14	<.001
Linear-by-Linear Association	17.878	1	<.001
N of Valid Cases	314		

a. 14 cells (58.3%) have expected count less than five. The minimum expected count is .13.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.586	<.001
	Cramer's V	.414	<.001
N of Valid Cases		314	

For these data, Cramer's statistic is .414 out of a possible maximum value of one. This represents a moderate association between level of education and the job position of the respondent in the organization. These results also confirm what the chi-square test above already indicated.

4.5 Hypothesis Testing using Pearson Correlation Coefficient

H_0 : Length of time using HRIS does not affect level of adoption of HCA in the organization

H_1 : Length of time using HRIS affects level of adoption of HCA in the organization.

The hypothesis test for the study was carried out and, the study examined data for normality which is the underlying assumption for most parametric tests. For each category of the independent variable, the dependent variable must be approximately normally distributed. Parametric tests are preferred for normally distributed data because they are more accurate. However, if the data fails the normality test, non-parametric analysis can be used, or a bootstrapping procedure can be used. A visual examination of the associated histograms, normal Q-Q plots, and box plots revealed that the length of time spent using HRIS was not normally distributed for the organization's level of HCA adoption. A Kolmogorov-Smirnov Test was conducted and produced the below stated results.

Table 6: One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test

			Time period since the introduction of HRIS	HR Analytics Maturity Level
N			314	314
Normal Parameters[a,b]	Mean		2.44	1.45
	Std. Deviation		.705	.499
Most Extreme Differences	Absolute		.351	.366
	Positive		.213	.366
	Negative		-.351	-.316
Test Statistic			.351	.366
Asymp. Sig. (2-tailed)[c]			<.001	<.001
Monte Carlo Sig. (2-tailed)[d]	Sig.		.000	.000
	99% Confidence Interval	Lower Bound	.000	.000
		Upper Bound	.000	.000

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.

The decision-making process in the Kolmogorov-Smirnov normality test.

1.If the Asymp.Sig. value is greater than 0.05, the data is normally distributed.

2.If Asymp.Sig.< 0.05, the research data is not normally distributed (Field,2018). Based on the output of One-Sample Kolmogorov-Smirnov Test, the value of the variable Asymp.Sig Time period since the introduction of HRIS value is <.001 and HR Analytics Maturity Level variables is <.001. In accordance with the basic decision-making in normality test, the value Asymp.Sig in all study variables are < 0.05, it can be concluded that the data Time period since the introduction of HRIS and HR Analytics Maturity Level are not normally distributed.

Table 7: Bootstrap Specifications

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	1000
Confidence Interval Level	95.0%
Confidence Interval Type	Bias-corrected and accelerated (BCa)

Table 8 :Correlations

Correlations

				HR Analytics Maturity Level	Time period since the introduction of HRIS
HR Analytics Maturity Level	Pearson Correlation			1	-.186**
	Sig. (1-tailed)				<.001
	N			314	314
	Bootstrap[c]	Bias		0	.003
		Std. Error		0	.055
		BCa 95% Confidence Interval	Lower	.	-.295
			Upper	.	-.074
Time period since the introduction of HRIS	Pearson Correlation			-.186**	1
	Sig. (1-tailed)			<.001	
	N			314	314
	Bootstrap[c]	Bias		.003	0
		Std. Error		.055	0
		BCa 95% Confidence Interval	Lower	-.295	.
			Upper	-.074	.

**. Correlation is significant at the 0.01 level (1-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

All of the significance values are less than .05, indicating a statistically significant relationship. Given the lack of normality in these variables, the researcher was more concerned with the bootstrapped confidence intervals rather than the significance value itself. This is because the bootstrap confidence intervals will be unaffected by the distribution of scores, whereas the significance value may be. These confidence intervals are labeled BCa 95% Confidence Interval and are presented as two values: the upper and lower boundaries. For the relationship between HR Analytics Maturity Level and the time period since the introduction of HRIS the interval is -.295 to -.074. HR Analytics Maturity Level was significantly correlated with time period since the introduction of HRIS, ***r*** = -.186 [-.295, -.074], (p = <.001) and that it is scant negative. For the Bootstrapped correlation to be significant the CIs must be on the same side, as either both negative or both positive. The CIs [-.295 and -.074] are both negative, which corroborates Pearson's correlation coefficient test's p and r values. Therefore, the alternate hypothesis of length of time using HRIS affects level of adoption of HCA in the organization can be rejected.

Previously, the researcher discovered a negative relationship between the two variables "time period since the introduction of HRIS and HR Analytics Maturity Level." The researcher wanted to look into this relationship further by seeing if the time period since the introduction of HRIS reliably predicts the HR Analytics Maturity Level. The linear regression statistical technique was used to accomplish this. The first table below summarizes the prediction of HR Analytics Maturity Level (the dependent variable) over time since the implementation of HRIS (the independent variable).

Table 9: Variables

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Time period since the introduction of HRIS[b]	.	Enter

a. Dependent Variable: HR Analytics Maturity Level

b. All requested variables entered.

The following table is a model summary that includes the correlation coefficient. This table was compared to the results of the Pearson correlation on the same data, which was shown earlier.

Table 10: Model summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.186[a]	.034	.031	.491

a. Predictors: (Constant), Time period since the introduction of HRIS

The R Square value in the Model Summary table represents the amount of variance in the dependent variable that the independent variable can explain. In this case, the independent variable of time since HRIS implementation accounts for 3.4% of the variation in HR Analytics Maturity Level. The R value (.186[a]) indicates that as time period since the introduction of HRIS study time increases the HR Analytics Maturity Level score does not also increase, and this is a negative correlation, with r = -.186. It is known to be statistically significant from the Pearson correlation output.

The ANOVA summary table that shows details of the significance of the regression.

Table 11:ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.681	1	2.681	11.137	<.001[b]
	Residual	75.103	312	.241		
	Total	77.783	313			

a. Dependent Variable: HR Analytics Maturity Level

b. Predictors: (Constant), Time period since the introduction of HRIS

Analysis of variance examines the regression model's significance. Does the independent variable, time since the introduction of HRIS, explain a significant portion of the variance in the dependent variable, HR Analytics Maturity Level, in this case? The essential pieces of information required for any ANOVA are the *df*, the *F* value, and the probability value. It can be observed from the above table that $F(1,312) = 11.137$, p <.001[b], and therefore can be concluded that the regression is statistically significant. Now there is the Coefficients output table, which gives the regression equation.

Table 12: Correlations

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.773	.100		17.738	<.001
	Time period since the introduction of HRIS	-.131	.039	-.186	-3.337	<.001

a. Dependent Variable: HR Analytics Maturity Level

The Unstandardized Coefficients B column gives us the value of the intercept (for the Constant row) and the slope of the regression line (from the Time period since the introduction of HRIS row) (Hinton *et al.*, 2014). This gives the following regression equation:

HR Analytics Maturity Level score = 1.773 + -.131 time period since the introduction of HRIS

The Standardized Beta Coefficient column informs us of the contribution that an individual variable makes to the model (Field, 2018). From the above table it can be observed that time period since the introduction of HRIS 'contributes' -.186 to HR Analytics Maturity Level, which is the Pearson's *r* value. The *t* value ($t = 17.738$, $p < .001$) for Constant tells that the intercept is significantly different from zero. The *t* value for time period since the introduction of HRIS ($t = -3.337$, $p < .001$) shows that the regression is significant.

4.6 FACTOR ANALYSIS

The main objective of factor analysis is to reduce the number of variables the researcher can deal with to simplify decision-making by identifying variables among many which might be important in the analysis (Watkins, 2021). The first procedure in this section was to determine the adequacy of the sample and to test whether or not data permitted factor analysis to be executed.

An Exploratory Factor Analysis (EFA) was executed on twenty items using SPSS version 26, through principal component analysis and promax rotation. The promax method of rotation was chosen because it attempts to maximize the dispersion of loadings within factors resulting in clusters of factors that are easy to interpret (Zhang & Preacher, 2015). Under each factor, the items were sorted by size, and factor loadings of less than 0.4 were suppressed following Steven's recommendation that only factor loadings greater than 0.4 should be considered for easy of interpretation (Lorenzo-Seva & Ferrando, 2020). EFA requires several assumptions to be met. An important step involved is weighing the overall significance of the correlation matrix through Bartlett's Test of Sphericity, which provides a measure of the statistical probability that the correlation matrix has significant correlations among some of its components. Bartlett's test of Sphericity should be significant at $p < 0.05$ for factor analysis to be performed (Field, 2009). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1974) was acceptable (. 817 for the total group of variables and .691, .688 to .611 for each of the measurement variables). In this regard the KMO statistic varies between 0 and 1; with zero denoting absolute inadequacy of the sample and one denoting absolute adequacy of the sample.

Kaiser recommended a statistic of 0.5 as the bare minimum for the sample to be adequate. The Bartlett's test of sphericity statistically rejected the hypothesis that the correlation matrix was an identity matrix (chi-square of 3460.454 with 78 degrees of freedom at p<.001). A visual scan of the correlation matrix revealed numerous coefficients>.30, and all these measures indicate that factor analysis is appropriate (Tabachnick & Fidell, 2019). Finally, the factor solution derived from this analysis fielded three factors for the scale, which accounted for sixty-eight point one (68.164%) percent of the variation in data. The three factors identified as part of this EFA aligned with the resource-based view theoretical proposition in this research. Factor one includes items q14, q15 & q16, referring to level of human capital adoption, factor two include items q8, q9 & q18 referring to lack of human capital analytics competency. Factor three (3) top management support is represented by indicators q11 and q12. Scholarly advice (Ping, 2008; Morrison *et al.*, 2017) provides that when formulating a model, a critical issue pertains to the number of manifest indicators that one should have for each latent variable.

The consensus is that ≥ 2 indicators per latent variable is required (ibid). In this regard, the yielded latent variables conform to the best practices of model development.

Table 13: KMO and Barlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.817
Bartlett's Test of Sphericity	Approx. Chi-Square	3460.454
	df	78
	Sig.	.000

In this exploratory factor analysis, the determinant was found to be bigger than 0.00001 (Determinant = 0.00001312) and this means that multicollinearity was not a problem. Residuals were computed between observed and reproduced correlations. There were twenty-seven (27) (representing 34.0%) non-redundant residuals with absolute values greater than 0.05. Literature (Field, 2018) states that this percentage should be less than 50% and the smaller it is, the better. Mostly, this criterion is accurate when there are fewer than thirty variables and communalities after extraction is greater than 0.7 or when the sample size exceeds 250 and the average communality is greater than 0.6. The thirteen communalities are shown in the SPSS Output table that forms part of this thesis's appendix and only five items exceed 0.7. The average of the communalities was found by adding them up and dividing them by the number of communalities (8.861/13 = 0.6816). Therefore, based on both grounds, Kaiser's rule was accurate.

Reliability analysis of the items loading on a particular factor was also done using Cronbach's α to determine whether or not the items reliably measured the underlying factor. This follows the recommendation by Cronbach that, where several factors exist, reliability analysis should be done separately on each of the factors (Field, 2018) . Accordingly, lack of human resource analytics competency, top management support and level of human capital analytics adoption sub-scales of the human capital analytics questions all had high reliabilities (.774, .849 and .749 respectively).

4.7 Structural Equation Modeling

Structural Equation Modeling (SEM) with JASP (Jefreys's Amazing Statistics Program) software (JASP 0.16.4.0) was applied for evaluation of causal relationship among latent variables lack of human resource analytics competency, top management support and level of human resource analytics adoption.

4.7.1 Data Preparation

Data preparation in this study involved ensuring that the sample size is adequate. Thus, a sample size of 419 respondents was chosen through stratified random sampling although there is no universally accepted rule for the specific sample size for structural equation modeling (Aryadoust & Liu, 2015).

4.7.2 Model Specification

Structural equation modeling is a statistical technique for testing and estimating causal relationships when dealing with multiple variables (Lin *et al.*, 2020). The first step in structural equation modeling (SEM) is to specify a model. In this regard, Field (2000) remarked that a model is simply a statement (or set of statements) about the relations between variables. This researcher was guided accordingly by the resource-based view theory and past research (Vargas, 2015) for model specification. For confirmatory factor analysis (CFA) model, the researcher developed a model comprising three latent variables representing lack of human resource analytics competency, top management support and level of human capital analytics adoption. This relationship is presented in a graphical model with one-headed arrows running from latent variables to the indicators.Lack of human resource analytics competency and top management support are the exogenous variables, the level of human capital analytics variable is the endogenous variable for this model. In this analysis, Jefreys's Amazing Statistics Program (JASP) software (version 0.16.4.0) was used to facilitate model identification evaluation. The latent variables with scores on ordinal scaled data were examined for adherence to univariate normality by examining their Kurtosis and Skewness coefficients. Multivariate normality was determined by Mardia's coefficient.

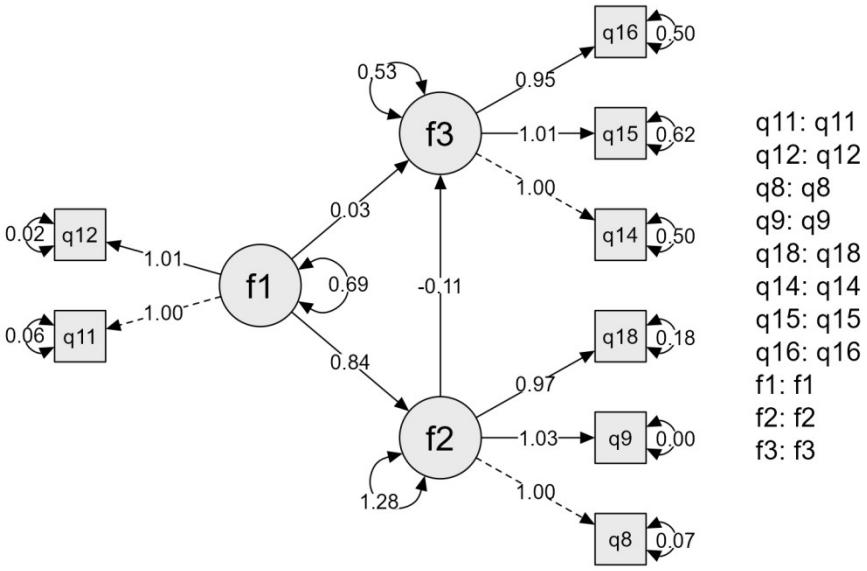


Figure 9: A CFA Model with the exogenous variables and endogenous variable (n=314)

As for parameter estimation, the researcher used the maximum likelihood (ML) method as the data used was normally distributed. Finally, for model fit and interpretation, the researcher estimated multiple fit statistics to evaluate the fit of model to data. To evaluate univariate normality, the researcher checked the skewness and kurtosis of the distribution. The values were found falling between -3 and +3, indicating no significant deviation from normal distribution (Kline, 2015). Multivariate normality was evaluated using the normalized Mardia's (1970) coefficient. In normal distributions, the Mardia's coefficient is <3 (Arbuckle & Wothke, 1999) as indicated on the table below.

Table 14: Mardia's Coefficients

Mardia's coefficients					
	Coefficient	**z**	**χ^2**	**df**	**p**
Skewness	138.986		7273.609	120	< .001
Kurtosis	293.154	-2.159			< .001

Source: Research survey, 2022

4.7.3 Alternative Model

Besides the above stated model, this treatise, acknowledged *a priori* the existence of Technology, Organization and Environment (TOE) as a model that is rival to the one tested (Weston & Gore, 2006). The main reason for the alternative model was to reflect other theoretical propositions or contradictions in empirical findings (Nunkoo, Ramkissoon, & Gursoy, 2013). The technology-organization-environment (TOE) framework was created by Tornatzky and Fleisher (1990). It describes factors that influence technology adoption and its likelihood. TOE describes the process by which an organization adopts and utilize technological innovations and is influenced by the technological context, the organizational context, and the environmental context (ibid). According to this theory, technological context aspect refer to the consideration of the interior, extrinsic technologies and the processes that are vital to the organization. Equally, the organizational context aspect pertain to the characteristics and resources of an organization, including its size, state of integration. Other elements included also are the degree of rationalization, managerial structure, people resources, amount of slack resources, and connection among employees. Lastly, environmental context includes magnitude and composition of the business enterprises, an organization's contenders, macroeconomic circumstances, and the regulative state of affairs. These elements present both opportunities and challenges for technological innovation in organizations today. Therefore, these three elements determine the way an organization sees the need for, searches for, and adopts new technology.

4.7.4 Results: CFA Model

After checking the univariate and multivariate normality of the data as discussed above, the researcher used the maximum likelihood (ML) method of parameter

estimation to test the fit of the CFA model. From the model identified, square nodes indicate manifest variables and circular nodes indicate latent variables. Directed edges (single-headed) indicate one variable having an effect on another variable and the circular curved arrows represent the variance of an indicator variable. Dashed lines indicates weak relationship and thicker lines indicate strong relationship between indicators and the associated latent variable. The hypothesized model for research objectives 2, 3 and 4 is shown in the table below. The chi-square statistic for the model in figure was non-significant (χ^2 = 30.679, d.f.= 17, p= > .05), indicating that there is no statistically significant difference between the model implied and the observed covariance matrix. Moreover, the **χ^2:** d.f value was 1.804, which is less than three and further supports good model fit. Similarly, the comparative fit statistics also confirm the fitness of the model as indicated above (CFI=.995, TLI=.992, NFI=.989, RMSEA= .051& SRMR= .052). The prediction relationship from (**f1**) top management support to lack of human resource analytics competency (**f2**) was statistically significant (p<.05), indicating that the overall top management score could positively predict human resource analytics competency of human resource professionals in state universities. However, the predicted relationship from top management support **(f1)** to level of human capital analytics adoption **(f3)** and from lack of human resource analytics competency **(f2)** to level of human capital analytics adoption **(f3)** were not statistically significant (p>.05). Top management support was positively linked with lack of human resource analytics competency ($\alpha = 0.524$) while top management support was positively linked with level of human capital analytics adoption (weak direct effect=0.038). Lack of human resource analytics competency and level of human resource analytics adoption were negatively linked ($\beta = -0.204$). In sum, hypothesis (**H_2**) which claimed that there is a significant relationship between organisational dimension factors and the level of adoption of human capital analytics in state universities was noted supported. Nevertheless, primary data revealed that there is a statistically significant relationship between top management support and lack of human resource analytics competency. Third hypothesis of the study (**H_3**) which claimed that there is a significant relationship between human dimension factors and level of human capital analytics adoption in state universities was not supported by the data. Hypothesis four (**H_4**) stating that there is a predictive model for human capital analytics adoption was supported by the data.

Cronbach's alpha coefficient was utilized in the present study along with composite reliability values to examine the inter-item consistency of the measurement items. The Cronbach's alpha and composite reliability (CR) values should be higher than 0.70 (Henseler *et al.*, 2015). With respect to Cronbach's Alpha and composite reliability value, Lin *et al* (2020) pointed out that the reliability which is higher than 0.9 is regarded as excellent, higher than 0.8 is fine, higher than 0.7 is adequate, higher than 0.6 is doubtful, and lower than 0.5 is substandard. The table below presents the values of Cronbach's alpha and CR of all constructs. It is evident that all reliability values were higher than the recommended value of 0.70. Hence, construct reliability was confirmed.

4.7.5 Convergent Validity

According to Hair *et al.* (2017), convergent validity assess the degree to which two measures of the same concept are correlated. They further suggest that researchers utilize the factor loadings, composite reliability (CR) and average variance extracted (AVE) to assess convergence validity. Convergent validity of scale items was estimated using Average Variance Extracted (Fornell& Larcker, 1981). The average variance extracted values were above the thresh-hold of .50 (Fornell& Larcker,1981) for all constructs except level of HRA adoption. However, since the composite reliability was well over the required value, the researcher concluded that HRA adoption construct was valid. According to results of the below shown table 10, the present study have the required convergent validity. Construct validity was assessed using Cronbach's Alpha and Composite Reliability. Cronbach alpha for each construct in the study was found to be over the required limit of .70 (Nunnally& Bernstein,1994). Composite reliabilities ranged from .749 to .969 and that was above the .70 benchmark (Hair *et al.*, 2010). Hence construct validity was established for each construct in this study (Table 15).

Table 15: Loadings, Reliability and Convergent Validity

Items	Loadings	Alpha	Composite Reliability	AVE
Lack of HRA Competency				
Q8	.979	**.774**	**.9696**	**.9410**
Q9	.999			
Q18	.951			
Level of HRA Adoption				
Q14	.725	**.749**	**.7492**	**.4991**
Q15	.69			
Q16	.704			
Top Management Support				
Q11	.957	**.849**	**.9696**	**.9410**
Q12	.983			

4.7.6 Discriminant validity

Discriminant validity in this study was assessed using Fornell and Larcker criterion. According to Fornell and Larcker criterion, discriminant validity is established when the square root of AVE for a construct is greater than its correlation with other constructs in the study. To determine the discriminant validity, the square root of AVE was compared against the correlations of the other constructs. Each latent variable square root of average variance extracted should be larger than the latent variable correlations (LVC).

As depicted in table below, the square root of the AVE for the constructs lack of human resource analytics competency, top management support and level of human resource analytics adoption are much larger than the corresponding latent variable correlations. Hence, the Fornell and Larker's criterion was achieved (Lin *et al.*, 2020).

Table 16 : Discriminant Validity

Component Correlation Matrix

Component	1	2	3
Level of HRA Adoption	.7064		
Lack of HRA competency	.589	.9765	
Top managemen t support	-.169	.015	.9700

Table 17: Fit indices of the hypothesized model and the data

Model	χ^2	p	df	χ^2/df	CFI	NFI	TLI	RMSEA	SRMR
	30.679	0.022	17	1.804	0.995	0.989	0.992	0.051	0.052

4.9 Key Informant Interview Results

Table 18: Key Informant Interview Findings

Name of Institution	**Payroll System used**
Midlands State University	Paywell
Manicaland State University of Applied Sciences	Paywell
Lupane State University	Paywell
Chinhoyi University of Technology	Belina
Zimbabwe Open University	Belina
N=15	

Source: Field Survey Data, 2023

Key informant interviews revealed that the majority of state universities employ the Belina or Paywell payroll systems. Fortunately, some software packages include a free HRM functions module that clients can use. It was discovered that senior managers and other staff are resistant to change in the adoption of human resource information systems. According to research subjects, the Belina Payroll package, which certain state institutions utilize, includes two more human resource modules: time control and human resources.These modules are free with the purchase of the Belina payroll package. Surprisingly, none of these modules are used by the recognized institutions' workers or top management.The transition from manual to computerized HR tasks is seen as time-consuming. One university's top administration chose to pay for the Belina connect license in order to take advantage of its cloud-based perks. However, the idea was abandoned prematurely, with the same top management staff claiming functional issues with the package and indicating contentment with the status quo. As a result, upper management's reluctance to change gained centre stage. Similarly, the Paywell payroll package used by other state institutes of higher learning has human resource features that are underutilized.

Instead, staff members are still accustomed to the hard copy paper files and managers have an old style interest of seeing piles of papers on their desks for signature appendage. Furthermore, research subjects revealed that there are different leaders responsible for human resource and payroll functions in the identified organizations. Therefore, such a structural set up sets a stumbling block to full implementation of workplace technologies and policy implementation. At the end of the day, organizational politics greatly affect smooth operations and implementation of modern technologies meant to improve work efficiency.

4.10 Documentary Analysis

The survey information furnished by research subjects was triangulated using document review. As indicated in chapter three under research instruments subheading, documentary review was guided accordingly by scholarly advice proffered by O'Leary (2014) and Centre for Disease Controls (CDC) (2018). The researcher chose the O'Leary's (2014) interview technique wherein the identified documents where treated like a respondent or informant that provides the researcher with relevant information. Accordingly, the researcher was guided by the research objectives stated in chapter one to come up with research questions in the text of the identified documents. Documentary review involved noting occurrences and key contents of the documents. Essentially, the researcher then organized the frequency and number of occurrences within the document. The information was then organized into what is related to the central questions of the research. It was observed that human resource analytics is still evolving(Marler & Boudreau, 2017). More is yet to be discovered about this topical area. Thus, documentary review was used by the researcher because of the need to develop other data collection tools like questions for interviews, questionnaires, or focus groups tools for evaluation in future studies. Furthermore, reviewing existing documents was done to better understand the human capital analytics program and the organizations under study. Some advantages of documentary review which persuaded the researcher was that they are good source of background information, provides a behind-the-scenes look at a program that may not be directly observable and they are generally inexpensive (CDC, 2018). Human capital analytics adoption and competency may not be directly observable, and the researcher therefore chose documentary review of ongoing records so as to get background information of the phenomenon.

Research permission was obtained from studied universities key personnel responsible for Human resource functions. It was indicated that most of the human resource management documents contained confidential information. Hence, the researcher was advised to view the documents essential to the study and ask key questions without making copies of same in order to maintain confidentiality. Importantly, the review was limited only to those documents that could answer the evaluation questions. In this case, identified documents were HR reports, Ministerial HR reports, Bursar management committee report and annual reports. In order to understand why and how the documents were produced in the host organizations, the researcher interviewed people (university deputy registrars, assistant registrars and human resource officers) who knew something about them. This was done to better understand the context for which the documents were developed and the procedure was critical to gathering usable information for this research's evaluation (CDC, 2018).

Table 19: Ongoing HR Practice Reports

Name	**Key Contents**	**Frequency of Production**	**Presentation Format**
1. HR Reports	Employee welfare, promotions, accidents, recruitment, retirements&pensions.	Every four months	Pie charts, graphs, tables and figures
2. Ministerial HR Report	Number of employees and grades	Monthly	Excel report (tables and figures)
3. Bursar management committee report	Leave pay provision	Quarterly	Excel report
4. Annual Report	All key functions of the organization report	Annually	Pie charts, graphs, tables and figures

Source: Documentary review, 2023.

Documentary review data collected from the sampled five state universities revealed that the great bulk of human resource reports are produced by human resource professionals except the bursar management committee report. Nevertheless, HR personnel has input to the report upon invitation by the University Bursar. Human resource analytics competency of the HR professionals is evident in the reports but specifically at the descriptive level of HR analytics.

4.11 DISCUSSION

4.11.1 Response rate

The overall response rate for this study was seventy six percent. Baruch and Holtom (2008) examined the response rates of studies published in seventeen leading academic journals. The average response rate for studies that utilized data collected from individuals was 52.7 percent. The response rate of the present study compares favorably with the rate suggested by Baruch and Holtom (2008) and Saunders *et al.* (2009). It is important to examine response rates for two key reasons. First, higher response rates lead to larger data samples which are more representative of the population and thus higher statistical power as well as smaller confidence intervals around sample statistics. Second, while a low response rate could undermine the perceived credibility of the collected data in the eyes of key stakeholders, higher response rates suggest greater reliability on the conclusions drawn from the data (Rogelberg & Stanton, 2007). The general attitude of the respondents towards the study was positive, however, differences could be noticed in some departments of three state universities like Central Services, Auditing and Catering where employees where somehow skeptical to entertain the researcher despite the presence of research permission letter. The managers/supervisors found at the work stations had to direct the researcher to their Directors so as to get an endorsement on top of the university granted research permission letter. The researcher observed that the respondents had not been subjected to previous human capital analytics studies. Of interest to note, also, is that those respondents who were more responsive to participate in the survey appreciated and understood the importance of research.

4.11.1 Demographic Characteristics of the Respondents

i. Gender of respondents

The study revealed male dominance of respondents as compared to females.

According to ZIMSTAT (2012a:9), there are more females (51.94%) than males (48.06%) in Zimbabwe. It is submitted that males are still, in some instances, more likely to be the breadwinners and thus the distribution of the sample was considered to be reasonably representative, though in contradiction with the ZIMSTAT official report. From another point of view, the gender status of respondents found in the host organizations could be a mirror image of the African culture. Despite some advances in equal opportunity employment laws and rights, some remnants of African cultural beliefs where women are supposed to remain at home, bear children, cook and scrub for their husbands are still in place. Globally, the observation concord with (Ignatius, 2013) who revealed that there are fewer women than men in job positions. In comparison, it is estimated that women hold about 15% of chief executive jobs and 17% of board seats in the United States of America.

ii. Age range of respondents

Almost twenty-five percent of the respondents were nearing retirement age of 60-65 years National Social Security Act (NSSA, Act). This depiction would mean that studied universities management would need to up their succession planning efforts. This would assist in curbing possible critical staff shortage in key areas of the universities. Nevertheless, seventy-four point two (74.2%) of the respondents from the study sample were in the ages 20-52. Studied state universities have a young workforce and most of the respondents were in their mid-careers.

iii. Level of education of research subjects

Obtaining results revealed high level of educated respondents. This can be attributed to the general observation as reported in the response rate, that the respondents were more responsive to participate in the survey because they appreciated the importance of research perhaps because they would have done research elsewhere especially at the tertiary education level. State universities tend to attract a number of employees with higher educational qualifications as they provide more and varied employment opportunities. Therefore, the composition of the sample was regarded to be acceptable as it included representatives from each educational level.

iv. Respondents' job position in the organization

Study results indicated three categories of respondents as consumers of HR services, HR professionals and senior management.

According to this study, consumers of human resource services within state universities are other staff members who do not practice or work as HR officials regardless of their job titles. HR professionals are those that practised human resource management and were office bearers within state universities. Senior management refers to the principal officers of the universities as defined by various university acts, for example Chinhoyi University of Technology Act (Chapter 25:23). The team of senior management was included as policy makers and resource locators who influence the adoption level of human capital analytics. Therefore, all important stakeholders in the adoption of human capital analytics were represented in the sample, indicating typical state universities hierarchical set up.

v. Length of service of respondents

Different lengths of service of research subjects were revealed. However, a key revelation was that 193 (61.5%) of the respondents had served for more than ten years in their organizations reflecting less various categories of staff movements outside the organization. As a result, many respondents were able to answer some of the questions about HR practices of the universities because of seniority in their positions and abundance of institutional memory.

4.11.2 Association between demographic variables

a. *Age range* length of service in the organization*

Association between age range and length of service in the organization was analyzed using Spearman's rank coefficient (*rs*). The association between age and length of service in the organization is positive (*rs* = .487). In other words, higher age ranges are associated with higher length of service in the organization. This would imply that the more mature a person becomes, the longer time one can serve in the organization.

b. *Level of education* respondent job position in the organization*

Results represents a moderate association between level of education and the job position of the respondent in the organization. In a practical sense, the level of education attained by different respondents in the host organizations do not squarely tally with the present job position. This value is highly significant ($p < .001$) indicating that a value of the test statistic that is this big is unlikely to have happened by chance, and therefore the strength of the relationship is significant.

4.12 Hypothesis Testing using Pearson Correlation Coefficient

The alternate hypothesis of length of time using HRIS affects level of adoption of HCA in the organization was rejected. The findings are consistent with those of Angrave *et al.* (2016), as reported by Lydgate (2018), who discovered that organizational HR information systems may be functionally restricted and only report historical data, resulting in descriptive analytics. Traditional analytics, while useful for reporting, is incapable of predicting critical employee and organizational outcomes. Instead of investing more resources in HR analytics, a company's focus may be on the day-to-day operations of running a business and achieving stability. Furthermore, current HR analysts' and managers' knowledge, skills, and abilities, particularly their quantitative skills, influence the extent to which HR analytics will result in prescriptive action in support of strategic business initiatives (Bassi, 2011).

4.13 Hypotheses Testing using Factor Analysis

Hypothesis ($\mathbf{H_2}$) which claimed that there is a significant relationship between organisational dimension factors and the level of adoption of human capital analytics in state universities was noted supported. Nevertheless, primary data revealed that there is a statistically significant relationship between top management support and lack of human resource analytics competency.Specifically, the results corroborate with the findings of Vargas's (2015) research study in the United States of America. Vargas study discovered that the factors impacting the adoption of HRA are not only in the hands of the HR professionals but to some extent, the organization as well. If organizations truly want to adopt HRA, they must make available to the HR professionals the tools, data, resources, and support necessary.

Additionally, the results concord with Quasar (2017) in Bangladesh which revealed that six variables; relative advantage, compatibility, complexity, top management support, HRIS expertise, and size of the organization, emerged as significant variables discriminating between adopters and non-adopters of HRIS. Furthermore, Chahtalkhi's (2016) research study in the Netherlands revealed six categories of challenges faced by HR organizations when implementing HR analytics. The six categories were (1) lack of business/management support and interest, which implies that the business does not recognize the necessity of an HR analytics team and thus, does not consider its benefits and added value.

Secondly, data and tools, which implies how to get the data, gaining a solid knowledge on which tools should be acquired as well as which methods are suitable for what kind of analytics techniques. Third, legal and compliance, (4), roles, which imply the roles that are needed to develop an HR analytics team, (5) training and skills, and (6) communication, which implies the lack of the right communication between the different entities. The current study findings concur with Boakye's (2019) research study in Ghana which sought to investigate the implications of HR analytics on human resource management practices from public and private sector organizations in Ghana. Boakye's (2019) study revealed that organizations that use HR analytics faced several challenges such as a lack of HR analytics competency, lack of management support, and poor data and tools management in appropriately digging into their employee data.

Third hypothesis of the study **(H_3)** which claimed that there is a significant relationship between human dimension factors and level of human capital analytics adoption in state universities was not supported by the data. From literature review, this contradict with a similar study by Lydgate (2018) in the United States of America (USA) which revealed that despite HR analytics being associated with successful companies such as Google, Apple, Disney, Amazon, and Microsoft (Bock, 2015; Morgan, 2017), some companies have been reluctant to design and develop an HR analytics function. Building the necessary support from upper management and decision-makers to support an HR analytics initiative will be the first challenge HR leaders may face before implementing a robust analytics function.

Hypothesis four (**H_4**) stating that there is a predictive model for human capital analytics adoption was supported by the data. The findings contradict with Fiocco (2017) study which identified that the mindset of HR professionals is another potential hindrance to the use of HR analytics. He asserts from his findings that, HR professionals are not ready or do not want to work with figures and numbers due to how they view HR analytics as involving more mathematical and statistical analysis. For this, Rasmussen and Ulrich (2015) strongly recommend that HR analytics is taken outside of the HR department and assigned to Line Managers until the HR function matures in the use of analytics.

Further expanding on the assertions accounting for the under-utilization of HR analytics in businesses, Deloitte (2015) conducted a study to find out why companies were struggling to move into the analytics arena. The findings indicated that the main reason for this under-utilization is due to what they refer to as the "capability gap". Deloitte (2015) conducted a study to find out why companies were struggling to move into the analytics arena. The findings indicated that the main reason for this under-utilization is due to what they refer to as the "capability gap". This capability gap entails poor data quality for analysis, a weak business case for introducing analytics change, and a lack of needed analytical skills. Bridging this capability gap will mean a company investing in expensive solutions from external vendors and building this capability internally.Therefore, in running effective human capital analytics, responsible managers must focus on and address factors that can cause a hindrance to this analysis. Equally, the findings are in tandem with Minbaeva (2018) study which revealed that analytical competencies are needed to design and implement measures toward organizational capability.

Although this study was limited to specific state universities in Zimbabwe, the researcher believes that the research results can be extended to other state universities with same nature of operations and same of source of funding. The results support the resource-based view theory elements like the tangible, intangible resources and capabilities. These skills include management skills (top management support), organizational processes, and the information and knowledge it controls (human capital analytics competency and the level of human resource analytics adoption) as a source of sustained competitive advantage. The theory provides a framework for understanding the importance of organizational resources and explains that the performance and sustainability of an organization depend on the resources owned and controlled by the organization. In this regard, resource-based view theory is a powerful theory for predicting the level of adoption of human capital analytics which was the key subject of this study. Furthermore, it applies to any type of business sector or organization regardless of its constitution, orientation, components, or scope. This study provide information for further understanding of the factors influencing adoption of human capital analytics in Zimbabwean state universities and predicting the kind of relationships between latent variables.

The study found a negative relationship between lack of human resource analytics competency and level of human resource analytics adoption. This therefore would reasonably mean that lack of HRA competency of HR professionals does not influence the level of HRA adoption alone although there is a relationship between the two variables. An organization's top management might decide to implement HRA technology software that caters for the last level of human capital analytics (prescriptive analytics) but without requisite competency from the responsible professionals. Thus, an interesting aspect here is brought to light. Any level of human capital analytics adopted should be accompanied by requisite training of everyday users of the technology. The indicated results partly support two elements technology and organization of the (TOE) as the alternative model in this study. However, there is a point of element extension in the composition of organizational context factors. Instead of concentrating on top management support only, the TOE model unveils size of an organization, state of integration, degree of rationalization, managerial structure and connection among employees. Meanwhile, the environmental context factor includes the magnitude and composition of the business enterprises, an organization's contenders, the macroeconomic circumstances, and the regulative state of affairs (Tornatzky and Fleisher, 1990). These elements present both opportunities and challenges for technological innovation in organizations today (Tornatzky and Fleisher, 1990). Therefore, these three elements determine the way an organization sees the need for, searches for, and adopts new technology.

In a nutshell, the adoption of human capital analytics in different organizations (including public institutions of higher learning) is not all that simple. Coherence and the structure of many factors ancillary to the core elements of the TOE model assist in the full adoption of human capital analytics in organizations. Thus, only a wholesome approach to the adoption of human capital analytics is the best way forward.

4.14 Key Informant Interview Results

A point of convergence of the results from all the key informant interviews conducted is that resistance to change and a negative structure of the organizations have a major role to play in HRIS implementation. Ultimately, key informants suggested that clear organizational structures be set up in state institutions to avoid internal political dynamics impeding adoption of modern technological infrastructure.

Resistance to change should be a thing of the past if institutions of higher learning are to successfully adopt 21st century cutting edge technology. From literature review, the findings corroborate the Harvard Business Review (2006) study which found that more than sixty percent of change drives fail to come to fruition in different organizations due to a plethora of factors. Factors like employee resistance to change, communication breakdown, insufficient time devoted to training, staff turnover during the transition, and costs exceeding budget were prevalent. Out of the five common obstacles a change leader can influence and improve employee resistance to change. From the findings, it was evident that top management as the expected change leaders can influence negatively the change agenda. Furthermore, the findings confirm the eight steps of Kotter change management theory. This theory that illustrate change can be implemented by following the linear eight steps. Nevertheless, in reality, change might not be manageable step by step as any organization might be confronted by the change in a more chaotic way.

Change in the business environment of the state universities was found to be influenced by forces like internal organizational politics and technological resistance to change. Hence, the government also as a stakeholder in the studied state institutions can put in place regulations that shape and transform how things are conducted in the organizations. Therefore, the proposed steps of Kotter might sound theoretically correct but also might appear less reliable during an actual transformation. From another angle, the findings contradict with Maganga (2018) study which revealed that the change management strategy of being able to diagnose accurately change forces affecting an organization has a positive effect on State Owned Enterprises (SOEs) performance. Nevertheless, a lesson drawn here is that change management theory of Kotter can be applied as a business excellence model and effective strategy to turn around organizations. The results feed into the second hypothesis of this study which claimed that there is a significant relationship between organisational dimension factors and level of human capital analytics adoption in state universities. From literature review, this in tandem with a similar study by Lydgate (2018) in the United States of America (USA) which revealed that despite HR analytics being associated with successful companies such as Google, Apple, Disney, Amazon, and Microsoft (Bock, 2015; Morgan, 2017), some companies have been reluctant to design and develop an HR analytics function.

Building the necessary support from upper management and decision-makers to support an HR analytics initiative will be the first challenge HR leaders may face before implementing a robust analytics function. Lastly, the results provide responses to research objectives one and two of this study as stated in chapter one. Accordingly, the human and organizational dimension factors impeding full adoption of human capital analytics are resistance to change, organizational politics as necessitated by negative organizational structure.

4.15 Documentary Review Results

Documentary review data collected from the sampled five state universities revealed that the great bulk of human resource reports are produced by human resource professionals except the bursar management committee report. Nevertheless, HR personnel has input to the report upon invitation by the University Bursar. Human resource analytics competency of the HR professionals is evident in the reports but specifically at the descriptive level of HR analytics. The results feed into second hypothesis of the study which proposed a relationship between top management support and lack of human resource analytics competency. Accordingly, documentary review findings corroborate with Boakye's (2019) research study in Ghana which sought to investigate the implications of HR analytics on human resource management practices from public and private organizations in Ghana. Boakye's (2019) study revealed that organizations that use HR analytics faced several challenges such as a lack of HR analytics competency, lack of management support, and poor data and tools management in appropriately digging into their employee data. There is no notable support of top management in human resource analytics adoption in the state universities though there are standard operating procedures which govern the way HR operates. Surprisingly, there is no strict requirement on the level of human resource analytics reports, especially descriptive, predictive and prescriptive analytics. A key observation was presentation of HR matters in tables, figures and chats through Microsoft excel. There was no evidence of specific sophisticated software used to do the HR reports besides the presence of Belina software. Interestingly, the Belina software was used to do payroll calculations only despite its capability to do other different HR practices reports.

Key questions asked about the use of other modules embedded in the Belina software indicated a lack of interest in using other HR functions module. The subscription fees for the other module called Belina connect was not always affordable. From literature review, the findings concord with Chahtalkhi's (2016) research study in the Netherlands revealed challenges faced by HR organizations when implementing HR analytics. The challenges were lack of business/management support and interest. Secondly, data and tools, which implies how to get the data, gaining a solid knowledge on which tools should be acquired as well as which methods are suitable for what kind of analytics techniques. Another study by Bersin, Leonard and Wang-Audia (2017) in the United States of America (USA) has shown that only 10% of Fortune 500 companies are using advanced analytics. Out of this 10%, only 4% are using predictive and prescriptive analytics and remaining 6% are still restricted to basic statistical techniques for HR analytics. In the Swedish state institutions of higher learning context, scholarly research on human capital analytics (HCA) reveal that organizations have a tradition of accounting for HR efforts in their annual reports. Primary data findings were also in tandem with Pape (2016) study which highlighted that HCA usage is still generally low and mostly limited to standard HR accounting and reporting. In sum, the picture depicted here was that the total number of organizations globally using advanced human capital analytics is small and distributed unequally. The results feed into the second and third hypothesis of the study (**H_2 & H_3**) which claimed a significant relationship between organisational and human dimension factors and the level of adoption of human capital analytics in state universities.

4.16 Chapter Summary

The chapter introduced by a discussion of the response rate and the degree of appreciation exhibited by the respondents during field survey. Though the researcher observed some skepticism behavior from research subjects, the general atmosphere was that respondents appreciated the value of research. More than fifty percent response rate was achieved in this study and implies that generalization of results to the larger population was not a difficulty. In order to achieve methodological triangulation, three data collection tools were used and these were structured questionnaire, key informant interviews and documentary review as supported by scholarly literature.

A statistical package for the social sciences (SPSS) version 26, Jefreys's Amazing Statistics Program (JASP 0.16.4.0) software and Micro soft excel were employed to analyze collected primary data for this research. Descriptive and inferential statistical techniques were used for data presentation especially on demographic elements of the respondents and hypotheses testing. Primary data supported the second hypothesis of the study and other three hypotheses were not supported by data. Though a link was observed between latent variables, it was a weak relationship. Documentary review done and key informant interviews conducted revealed that state universities adopted human capital analytics but are still at the descriptive level of analytics.

CHAPTER 5: CONCLUSIONS AND IMPLICATIONS

5.1 Introduction

The previous chapter four presented and examined the research findings, and this last chapter five provides the study's conclusions and ramifications. The research conclusions are founded on the research objectives and related hypotheses outlined in Chapter 1 of this thesis. The data and discussion presented in Chapter 4 form the basis for the research conclusions. The study findings' implications for policy and practice, the present body of knowledge, and research methods are also discussed. Finally, the limits of the research are noted in order to make recommendations for future research.

5.2 Conclusions

The project aimed to create a prediction model for the implementation of human capital analytics in Zimbabwean public universities. The findings and interpretation of the data provide adequate evidence to show a link between top management support and a lack of human resource analytics proficiency. Human resource experts are capable of producing human resource analytics reports, albeit at an early stage (descriptive analytics). This means that top management assistance is critical in boosting HR professionals' and the organization's overall human resource analytics proficiency level. A detailed examination of the results, as well as the alternative model of this study (TOE), reveals that this relationship is not overly simple. In fact, top management support is one of many interconnected organizational dimension determinants. The bigger organization dimension element, as a determinant of effective human capital analytics adoption, has organizational traits and resources. It also covers the size of the company, its stage of integration, the degree of rationalization, the managerial structure, the quantity of slack resources, and employee connections. If key stakeholders seriously analyze all of these individual items, adoption of human capital analytics would be simple, assuming all other factors remain unchanged. According to the findings of primary data, HR Analytics Maturity Level is significantly connected with time since the introduction of human resource information systems (HRIS). Nonetheless, the negative relationship was scarce and provided adequate evidence to demonstrate that having several years of using HRIS does not lead to the adoption of the last level of HRA.

Because of the nature of business operations, a company can choose to implement HRA beginning with the final stage of prescriptive analytics or just retain a low level of HR analytics. Human resources information systems may be functionally limited and simply report historical data, resulting in descriptive analytics.While traditional analytics might be useful for reporting, it cannot forecast crucial employee and organizational outcomes. Instead of spending more resources in HR analytics, a company's focus may be on day-to-day operations and establishing stability. The extent of human resource analytics adoption is influenced by perceived cost, reluctance to change, bad organizational structure, top management support, and human resource analytics.

Only top management support and a lack of human resource analytics proficiency have a substantial impact on one another. As a result, the two components alone are insufficient to determine the level of adoption of human capital analytics. This shows that, while these criteria may be essential in determining HRA adoption levels, there are additional factors that influence HRA adoption levels. Perceived cost, reluctance to change, technical background, and broad organizational and environmental issues are among them. Today's enterprises face both possibilities and problems in terms of technological innovation.

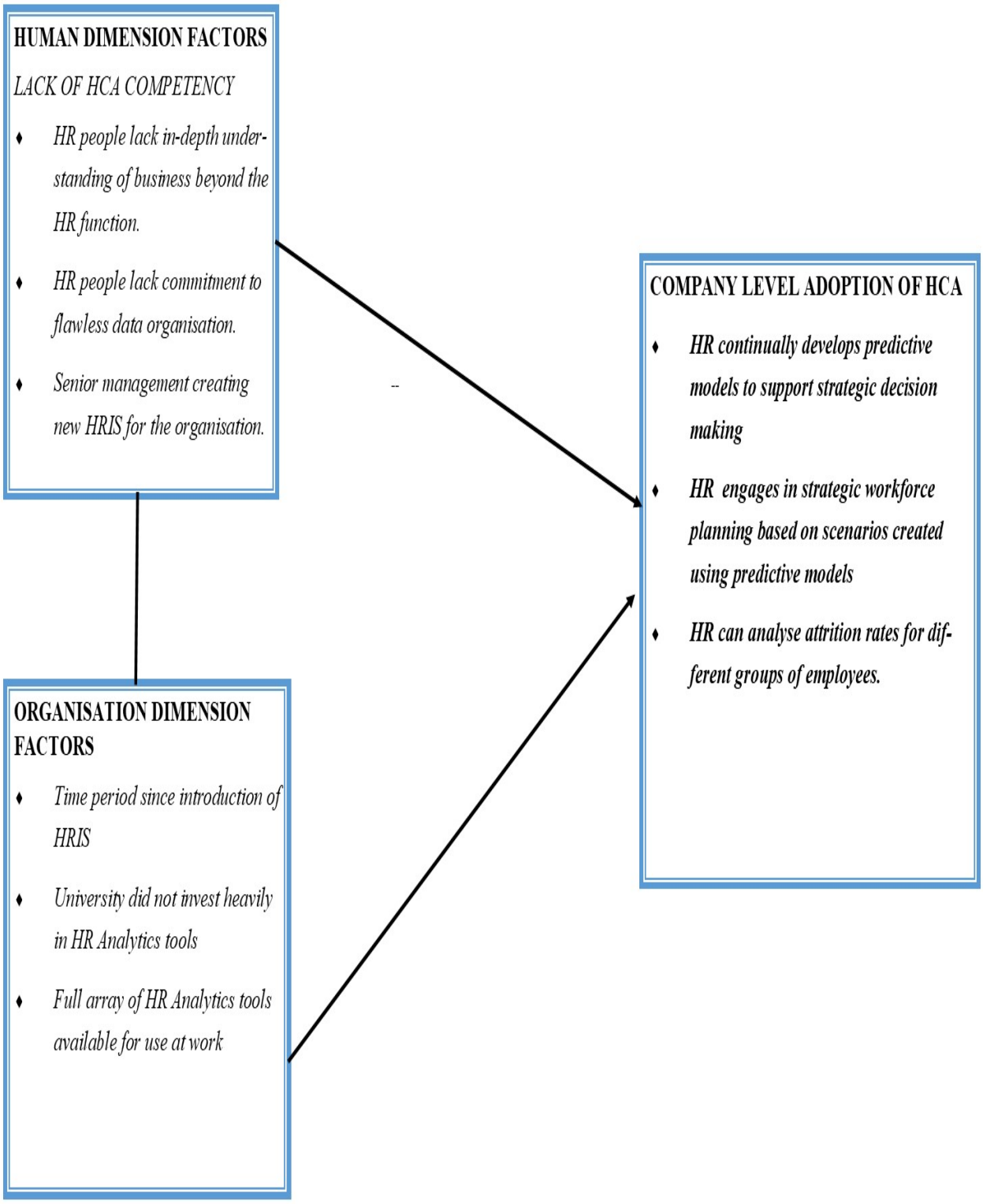
The research findings and interpretation demonstrated a limited association between top management support and the level of human capital analytics in host businesses. Given this context, it is reasonable to assume that top management support as an organizational dimension element influencing the degree of human capital analytics cannot be unilaterally affected in order to achieve a high level of HRA adoption. According to the technology-organization-environment (TOE) theory, there are other aspects that are not related to top management support. As a result, full adoption of human capital analytics in various businesses necessitates the simultaneous and deliberate manipulation of numerous aspects. This would entail creating policies and processes for an HR analytics function. Implementing a sophisticated analytics role by HR executives may still be difficult if senior management and decision-makers are not on board.

The data indicate that there is no significant association between a lack of human resource analytics expertise and the level of human capital analytics adoption in state universities. Although HR professionals were shown to appreciate descriptive analytics, it can be argued that HR professionals' mindsets would be another possible obstacle to the implementation of HR analytics. HR practitioners are hesitant to deal with figures and numbers because they perceive HR analytics to entail more quantitative and statistical analysis.

5.3 Implications for human resource analytics knowledge and theory

There has been a dearth of studies that have comprehensively explored human capital analytics adoption and the associated determinants in developing countries, particularly in the African continent's southern hemisphere. In state universities, little is known about the issue. As a result, the study fills a knowledge gap. There has been a global scarcity of human capital analytics adoption studies. As a result, the current study is an important addition to human capital analytics adoption studies and discourse. The study discovered an adverse association between a lack of human capital analytics competency and a level of human capital analytics adoption.Although there is a relationship between the two factors, this study adds to the current general awareness that HRA ability of HR professionals does not influence the amount of HRA adoption alone. The senior management of an organization may opt to implement HRA technology software that caters for the last level of human capital analytics (prescriptive analytics), but without the necessary capability from the responsible experts. As a result, each degree of human capital analytics used should be accompanied by the necessary training for everyday users of the technology.The study discovered a strong correlation between top management support and a lack of human capital analytics proficiency. This suggests that good support from top management for concerned employees can raise the level of human resource analytics proficiency. The study discovered a link between top management support, a lack of human resource analytics proficiency, and the extent of human capital analytics adoption.Other factors influencing human capital analytics adoption included resistance to change, perceived expense, and a poor organizational structure. As a result, the literature on human resource analytics should pay more attention to the established link.

It is conceivable to build a model based on this research that shows proven correlations between top management support, organizational structure, reluctance to change, human capital analytics competency, and perceived costs. The aforementioned findings have substantial implications for leading theory (resource-based perspective theory) on the use of human capital analytics in businesses. The theory provides a framework for understanding the significance of organizational resources and illustrates how an organization's success and sustainability are dependent on the resources it owns and controls.The tangible and intangible resources and capabilities (which include management skills, organizational processes and routines, and the information and knowledge it controls) may be a source of sustained competitive advantage if they are rare, valuable, imperfectly imitable, and non-substitutable (Barney, 1991; Barney *et al*., 2001). Human capital analytics can be thought of in terms of the all-encompassing TOE model. Thus, current findings point to a revision of the resource-based perspective paradigm.


HUMAN DIMENSION FACTORS
LACK OF HCA COMPETENCY
HR people lack in-depth understanding of business beyond the HR function.
HR people lack commitment to flawless data organisation.
Senior management creating new HRIS for the organisation.
ORGANISATION DIMENSION FACTORS
Time period since introduction of HRIS
University did not invest heavily in HR Analytics tools
Full array of HR Analytics tools available for use at work
COMPANY LEVEL ADOPTION OF HCA
HR continually develops predictive models to support strategic decision making
HR engages in strategic workforce planning based on scenarios created using predictive models
HR can analyse attrition rates for different groups of employees.

As a result of this research, it was possible to build a model with confirmed significant correlations between organization, human dimension components, and level of HCA adoption, as shown in the figure above. Aside from this approach, the literature on human resource analytics should focus on emergent factors revealed by the study's qualitative findings. Change resistance, perceived expense, and an unfavorable organizational structure are among the issues. As a result, the present theory should be revised to accommodate this discovery.

5.4 Methodological Implications of the study

The current findings have important methodological implications for future research efforts to define the relationships between factors influencing human capital analytics adoption and the amount of human capital analytics adoption in institutions of higher learning. It will be especially necessary to address the varied nature of adoption factors such as human dimension and organizational dimension aspects. The quantitative research strategy and the three data gathering technologies were insufficient. When other psychological aspects are involved, quantitative statistics alone will not provide a good understanding of the causes inhibiting the full adoption of HRA. Future study must evaluate the subject matter using a combination of methodologies because this is the only way to comprehend this complicated phenomenon. The current study contributes to human capital analytics research technique by developing and validating new construct measures for lack of human resource analytics competency, top management support, and amount of human resource analytics adoption.

5.5 Implications for policy and practice

Given that the study found that top management support, perceived cost, and human capital analytics competency all predict the amount of human capital analytics, it is suggested that senior management in these state institutions focus on training key personnel on how to use technical tools. Policies outlining how HR practice reports should be completed would also be an important element of the training endeavor. Change management strategies and organizational structure improvements would be implemented. This is significant since the extent of human capital analytics adoption is linked to well-trained employees and management and other decision-makers' support. It is thought that if major internal organizational variables are addressed first, other external factor challenges can be solved.

Thus, well-maintained internal systems and support would imply favorable and widespread use of human capital analytics. Because human capital analytics is a nascent topic, identified state institutions would also establish study programs aimed at educating the corporate world. The survey discovered a perceived high cost of integrating human capital analytics, particularly in terms of license costs. From a management standpoint, there is a need for management to grasp the value associated with complete adoption of human capital analytics so that they can obtain funding to promote and stay current on new advancements in the sector.

5.6 Limitations of the study and future research

The current study, while having managerial, academic, and methodological consequences, is constrained by a few variables. Future study should focus on these and other growing concerns. The current study concentrated solely on human dimension and organizational dimension aspects, as well as the amount of human capital analytics implementation. This suggests that the study's findings can only be generalized to these parameters. Furthermore, the study sample was selected solely from five specified state universities, despite the fact that Zimbabwe has multiple state universities. It is therefore suggested that additional research be performed to evaluate human capital analytics utilizing a larger sample size of at least ten state institutions and possibly using a longitudinal research project.

Extending the current study into privately held universities in Zimbabwe is another area where future research could be focused. A comparison study of privately owned and publicly funded institutes of higher learning may be required. Another topic that future academics may be interested in is the constraints preventing full adoption of human capital analytics in Zimbabwe and other poor nations. To have a better understanding of this phenomena, several additional studies are needed to assess the statistical significance of the identified and emerging factors impacting the adoption of human capital analytics in businesses. Finally, it is recommended that more research of this type be done, particularly in developing and emerging economies, to validate the current study's findings and deepen understanding of the phenomenon.

5.8 Chapter Summary

The chapter examined the research findings, made conclusions and implications to theory, practice and knowledge. The study results indicated both organisational dimension factors and human dimension factors as hindering the full adoption of human capital analytics in Zimbabwean state universities. Human resource professionals in Zimbabwean state universities are reporting at descriptive level of HRA. It was noted that top management support in human capital analytics adoption is very essential, continuous training and modification of the key study theory should be considered as well.Further research using mixed methodology conceptualization was recommended.

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APPENDIX 1: DEMOGRAPHIC ELEMENTS

Length of service table

length of service in the organization

	N	%
1- 5 years	55	17.5%
6-10 years	66	21.0%
11-15 years	114	36.3%
16-20 years	52	16.6%
21 or more	27	8.6%

Table 20: Level of education*respondent job position in the organization

			respondent job position in the organization			
			Consumer of HR Services	HR Professional	Senior Management	Total
level of education	O level	Count	6	0	0	6
		% within respondent job position in the organization	2.4%	0.0%	0.0%	1.9%
	A level	Count	2	0	0	2
		% within respondent job position in the organization	0.8%	0.0%	0.0%	0.6%
	Professional	Count	25	0	0	25

	certificate	% within respondent job position in the organization	10.0%	0.0%	0.0%	8.0%
	Diploma	Count	58	24	0	82
		% within respondent job position in the organization	23.1%	57.1%	0.0%	26.1%
	Bachelor's degree	Count	47	6	0	53
		% within respondent job position in the organization	18.7%	14.3%	0.0%	16.9%
	Master's degree	Count	91	11	9	111
		% within respondent job position in the organization	36.3%	26.2%	42.9%	35.4%
	Doctorate degree	Count	21	1	7	29
		% within respondent job position in the organization	8.4%	2.4%	33.3%	9.2%
	Professor	Count	1	0	5	6
		% within respondent job position in the organization	0.4%	0.0%	23.8%	1.9%
Total		Count	251	42	21	314

	% within respondent job position in the organization	100.0%	100.0%	100.0%	100.0 %

APPENDIX 2: COMMUNALITIES

Communalities

	Initial	Extraction
HR people lack in-depth understanding of business beyond HR function	1.000	.951
HR people lack commitment to flawless data organization	1.000	.969
HR professionals lack statistical measurements appreciation so as to fully adopt HCA	1.000	.455
The university did not invest heavily in HR analytics tools	1.000	.750
I do not have a full array of HR analytics tools available for use at work	1.000	.772
Senoir management is not helpful in the use of HR analytics	1.000	.753
At my organization HR continually develops predictive models to support strategic decision-making	1.000	.605

At my organization HR engages in strategic workforce planning based on scenarios created using predictive models	1.000	.663
At my organization HR can analyze attrition rates for different groups of employees	1.000	.681
Direct and indirect costs for HCA is high for our organization	1.000	.553
The maintenance and support fees for HCA applications are high for the organization	1.000	.226
HR people lack IT capability to do HR analytics	1.000	.541
Senior management would soon create a new HRIS for the organization	1.000	.942

Extraction Method: Principal Component Analysis.

APPENDIX 3: PRETESTING STRUCTURED QUESTIONNAIRE

I am Kebiat Mukuze, a Doctoral student at Chinhoyi University of Technology. In an effort to meet one of the requirements for a doctoral degree, I am conducting a research study titled "Adoption factors influencing human capital analytics among human resource professionals in Zimbabwean state universities". The data collected by this study and the conclusions generated will complete my doctoral thesis. This survey is completely anonymous, so please answer each question honestly.

Research Objectives

1. To appraise the relationship between level of human capital analytics and the time period since state universities introduced HRIS
2. To determine human dimension factors inhibiting the adoption of human capital analytics
3. To assess organizational dimension factors acting as barriers to the adoption of human capital analytics
4. To develop a predictive model for the level of adoption of human capital analytics

Section A-Demographic Profiles of Respondents

1. Indicate by putting a tick on the age range to which you belong

□ 20-30
□ 31-41
□ 42-52
□ 53-63
□ 64-75

2. Indicate your gender by putting a tick on the corresponding box

□ Male
□ Female

3. What is your highest level of education?

□ Ordinary Level School Certificate
□ Advanced Level School Certificate
□ Professional Certificate
□ Diploma

□ Bachelor's Degree

□ Master's Degree

□ Doctorate Degree

□ Professor

4. How long have you worked for your current employer?

□ 1-5 years

□ 6-10 years

□ 11-15 years

□ 16-20 years

□ 21 or more years

5. Please state your current job position:_____

6. How long has it been since your university introduced HRIS?

□ 1-4 years

□ 5-10 years

□ 11 years & above

Section B:Utilization of human capital analytics

7. All human resources personnel have IT skills to support human resources function

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

8. Human Resources Department lacks individuals with boundary-spanning behavior

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

9. Adoption of HCA requires individuals with an in-depth understanding of the business beyond the HR function

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

10. HR professionals lack HR analytics competency

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

11. HR people lack IT capability to do HR analytics

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

12. HR professionals lack boundary-spanning behavior

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

13. HR people lack in-depth understanding of business beyond HR function

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

14. HR people lack commitment to flawless data organization

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

15. HR people lack management support in order to fully adopt HCA

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

16. HR professionals lack statistical measurements appreciation so as to fully adopt HCA

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

17. Senior management are enthusiastic to experiment a new information system

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

18. Senior management are not afraid to try out new information system

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

19. Senoir management often risk doing things differently

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

20. Senior management would sooner create new HRIS for the organization

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

21. Top management enthusiastically supports the adoption of HCA

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

22. Top management has allocated adequate resources for the adoption of HCA

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

23. The maintenance and support fees for HCA applications are high for the organization

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

24. University data base does not have all the data I need to use with HR analytics

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

25. The university did not invest heavily in HR analytics tools

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

26. I do not have a full array of HR analytics tools available for use at work

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

27. Senoir management is not helpful in the use of HR analytics

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

28. At my organization HR provides actionable solutions based on data analysis

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

29. At my organization HR continually develops predictive models to support strategic decision-making

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

30. At my organization HR engages in strategic workforce planning based on scenarios created using predictive models

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

31. At my organization we have a dedicated HR Officer in the university council

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

32. At my organization HR runs analyses based on integrated data from different HR functions

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

33. At my organization HR decisions are based on data analysis

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

34. At my organization HR can analyze attrition rates for different groups of employees

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

35. At my organization HR provides dashboards with relevant metrics to senior management

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

36. At my organization HR is involved in data-driven trend analysis

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

37. Top management is aware of the benefits of HCA

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

38. Implementation cost of HCA is high for our organization

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

39. Direct and indirect costs for HCA is high for our organization

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

APPENDIX 4: PILOT TESTING STRUCTURED QUESTIONNAIRE

I am Kebiat Mukuze, a Doctoral student at Chinhoyi University of Technology. In an effort to meet one of the requirements for a doctoral degree, I am conducting a research study titled "Adoption factors influencing human capital analytics among human resource professionals in Zimbabwean state universities". The data collected by this study and the conclusions generated will complete my doctoral thesis. This survey is completely anonymous, so please answer each question honestly.

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To determine human dimension factors inhibiting the adoption of human capital analytics

3. To assess organizational dimension factors acting as barriers to the adoption of human capital analytics

4. To develop a predictive model for the level of adoption of human capital analytics

Section A-Demographic Profiles of Respondents

1. Indicate by putting a tick on the age range to which you belong

□ 20-30

□ 31-41

□ 42-52

□ 53-63

□ 64-75

2. Indicate your gender by putting a tick on the corresponding box

□ Male

□ Female

3. What is your highest level of education?

□ Ordinary Level School Certificate

□ Advanced Level School Certificate

□ Professional Certificate

□ Diploma

□ Bachelor's Degree

□ Master's Degree

□ Doctorate Degree

□ Professor

4. How long have you worked for your current employer?

□ 1-5 years

□ 6-10 years

□ 11-15 years

□ 16-20 years

□ 21 or more years

5. Please state your current job position:_____

6. How long has it been since your university introduced HRIS?

□ 1-4 years

□ 5-10 years

□ 11 years & above

Section B:Utilization of human capital analytics

7. All human resources personnel have IT skills to support human resources function

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

8. Human Resources Department lacks individuals with boundary-spanning behavior

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

9. Adoption of HCA requires individuals with an in-depth understanding of the business beyond the HR function

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

10. HR professionals lack HR analytics competency

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□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

11. HR people lack IT capability to do HR analytics

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

12. HR professionals lack boundary-spanning behavior

□ Strongly Disagree

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□ Neutral

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□ Strongly Agree

13. HR people lack in-depth understanding of business beyond HR function

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19. Senoir management often risk doing things differently

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20. Senior management would sooner create new HRIS for the organization

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□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

39. Direct and indirect costs for HCA is high for our organization

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

Thank you for taking your time to complete this questionnaire. If you have any queries, please do not hesitate to contact me on Cell No: 0775 807 624.

FURTHER QUESTIONNAIRE-PILOT TESTING

1-How long did the questionnaire take you to complete?

2-Which, if any, of the questions was unclear?

3-Any comment on the clarity of the instructions

4-Was the layout of questions clear and attractive?

5-In your own opinion, was there any major topic omission?

6-Any other comments.

APPENDIX 5: CONSENT FORM

Dear Potential Respondent,

I invite you to participate in a research project that aims to explore the adoption factors influencing human capital analytics among human resource professionals in Zimbabwean state universities. I am currently enrolled for the Doctor of Philosophy (DPhil) study with Chinhoyi University of Technology.The attached questionnaire has been designed to collect information on respondents' demographic information and human capital analytics in the organization.The information you provide may help form an understanding on what baseline knowledge human resource professionals possess in order to ultimately contribute to the adoption of human capital analytics in state universities.Your participation in this research project is completely voluntary and your identity will remain confidential.The results of the study, including any other data published,will not include your name or any identifiable references to you. Please note that the researcher will personally collect the completed questionnaire after two working days.

Thank you for your assistance and appreciation in this important academic endeavour.

Please refer any further questions you have about this study to the following:

Principal Researcher: Kebiat Mukuze

Phone Number: 0775 807 624

Supervisors: Professor Chavunduka

Phone Number:0774 358 385

Professor Manuwere

Phone Number:0783 173 416

APPENDIX 6: STRUCTURED QUESTIONNAIRE FOR HR PROFESSIONALS

I am Kebiat Mukuze,a Doctoral student at Chinhoyi University of Technology. In an effort to meet one of the requirements for a doctoral degree, I am conducting a research study titled "Adoption factors influencing human capital analytics among human resource professionals in Zimbabwean state universities". The data collected by this study and the conclusions generated will complete my doctoral thesis. The survey is completely anonymous,so please answer each question honestly.

HR analytics Definition

Marler and Boudreau (2017, p. 15.) defines HR analytics as 'an HR practice enabled by information technology that uses descriptive, visual, and statistical analyses of data related to HR processes, human capital, organizational performance, and external economic benchmarks to establish business impact and enable data-driven decision-making'.

HRIS stands for Human Resources Information System. HRIS can be defined as integrated systems used to gather, store and analyze information regarding an organization's human resources.

Research Objectives

- To appraise the relationship between level of human capital analytics and the time period since state universities introduced HRIS
- To determine human dimension factors inhibiting the adoption level of human capital analytics in state universities.
- To assess organizational dimension factors acting as barriers to the adoption level of human capital analytics in state universities.
- To develop a predictive model for adoption level of human capital analytics in Zimbabwean state universities.

Section A:Demographic Profiles of Respondents

1. Indicate by putting a tick on the age range to which you belong

□ 18-19

□ 20-30

□ 31-41

□ 42-52

□ 53-63

□ 64-75

2. Indicate your gender by putting a tick on the corresponding box

□ Male

□ Female

3.What is your highest level of education?

□ Ordinary Level School Certificate

□ Advanced Level School Certificate

□ Professional Certificate

□ Diploma

□ Bachelor's Degree

□ Master's Degree

□ Doctorate Degree

□ Professor

□ Other_____

4.HR Analytics Maturity Level

□ 1 0-5 points

□ 2 6-11 points

□ 3 12-18 points

□ 4 19 points & above

5.How long have you worked for your current employer?

□ 1-5 years

□ 6-10 years

□ 11-15 years

□ 16-20 years

□ 21 or more years

6.How long has it been since your university introduced HRIS?

□ 1-4 years

□ 5-10 years

□ 11 years & above

Section B:Human Capital Analytics Competency

7.HR people lack in-depth understanding of business beyond HR function.

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

8.HR people in this organization lack commitment to flawless data organization

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

9.HR professionals lack statistical measurements appreciation so as to fully adopt HCA

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

10.HR people lack IT capability to do HR analytics

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

Section C: Top management support

11.The university did not invest heavily in HR analytics tools

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

12.I do not have a full array of HR analytics tools available for use at work

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

13.Senior management is not helpful in the use of HR analytics

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

Section D: Level of HR Adoption

14.At my organization HR provides actionable solutions based on data analysis

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

15.At my organization HR continually develops predictive models to support strategic decision-making.

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

16.At my organization HR engages in strategic workforce planning based on scenarios created using predictive models

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

17.At my organization HR decisions are based on data analysis

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

18.At my organization HR can analyze attrition rates for different groups of employees

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

Section F: Perceived Cost

19.Direct and indirect costs for HCA is high for our organization

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

20.The maintenance and support fees for human capital analytics applications are high for the organization

□ Strongly Disagree

□ Disagree

□ Neutral

□ Agree

□ Strongly Agree

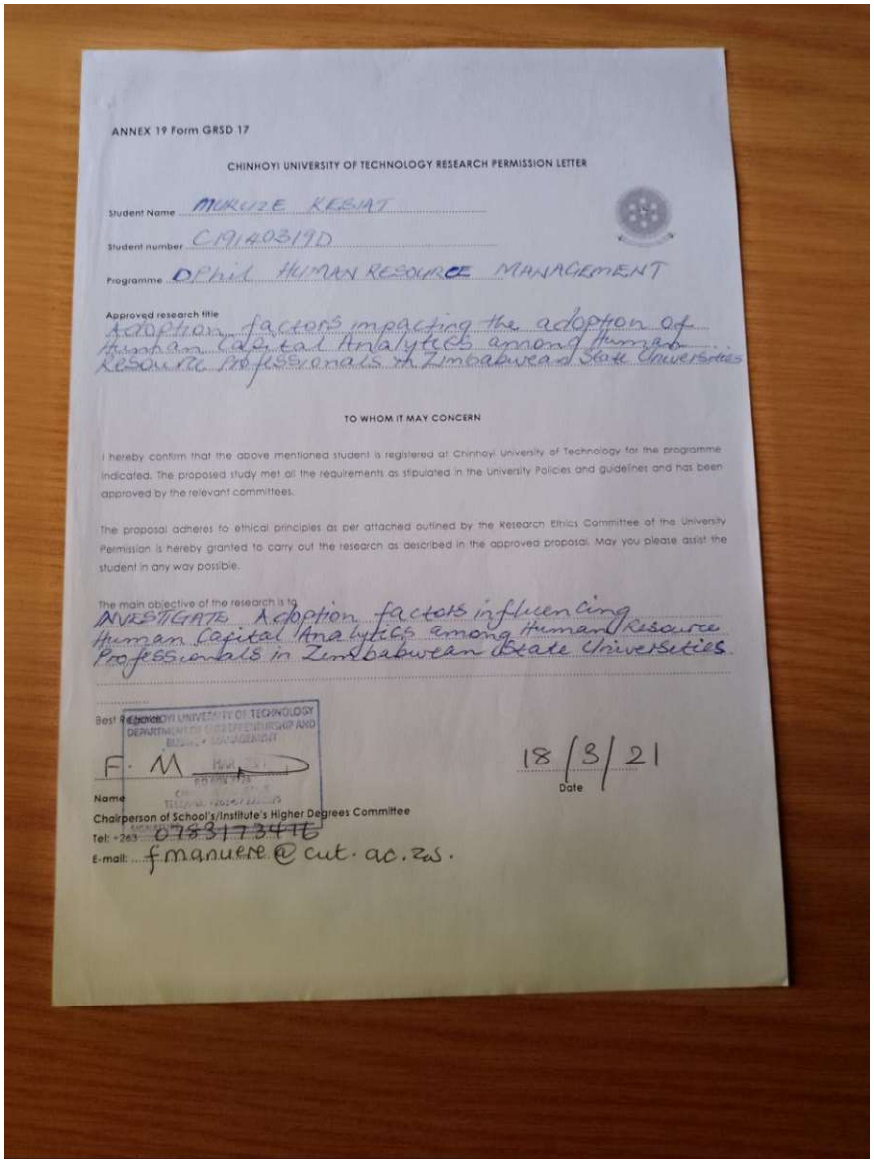
Thank you for the cooperation

APPENDIX 7: KEY INFORMANT INTERVIEW QUESTIONNAIRE

1. Could you please tell me more about your past job title
2. Tell me about the activities you have been involved in with your former employer?
3. What tools have you used that have been particularly effective in executing your mandated tasks?
4. From your knowledge and experience in the university community, which software package was used for payroll administration?
5. Does the software package have any HR functions embedded in it?
6. If yes to the above, which HR functions could be performed by the software?
7. Did the organization utilize all the benefits associated with software package?
8. If no to the above question, what were some of the reasons for none utilization known you?
9. What suggestions do you have in terms of how state universities might overcome these challenges?
10. What other thoughts would you like to share?

Thank you for taking time for this interview. If you have additional questions or concerns, I can be reached at _____.

APPENDIX 8: ETHICAL CLEARANCE LETTER



ANNEX 19 Form GRSD 17

CHINHOYI UNIVERSITY OF TECHNOLOGY RESEARCH PERMISSION LETTER

Student Name MUKUZE REBIAT

Student number C1912031 9D

Programme D Phil HUMAN RESOURCE MANAGEMENT

Approved research title
Adoption factors impacting the adoption of Human Capital Analytics among Human Resource Professionals in Zimbabwean State Universities

TO WHOM IT MAY CONCERN

I hereby confirm that the above mentioned student is registered at Chinhoyi University of Technology for the programme indicated. The proposed study met all the requirements as stipulated in the University Policies and guidelines and has been approved by the relevant committees.

The proposal adheres to ethical principles as per attached outlined by the Research Ethics Committee of the University Permission is hereby granted to carry out the research as described in the approved proposal. May you please assist the student in any way possible.

The main objective of the research is to
INVESTIGATE Adoption factors influencing Human Capital Analytics among Human Resource Professionals in Zimbabwean State Universities.

Best Regards CHINHOYI UNIVERSITY OF TECHNOLOGY DEPARTMENT OF GOVERNANCE AND BUSINESS MANAGEMENT

F. M

Name
Chairperson of School's/Institute's Higher Degrees Committee
Tel: +263 0783173416
E-mail: fmanuere@cut.ac.zw.

18/3/21
Date

APPENDIX 9: RESEARCH PERMISSION LETTERS

ZIMBABWE OPEN UNIVERSITY

"Empowerment Through Open Learning"

From the Office of the Registrar

Ref: NC14/1/1

19 May 2021

Mr Kebiat Mukuze
House Number 1105
Senga KMP
Gweru

Dear Mr Mukuze

RE: REQUEST FOR PERMISSION TO UNDERTAKE RESEARCH AT ZIMBABWE OPEN UNIVERSITY

Reference:

'A' Your Letter dated 23 April 2021

We acknowledge receipt of reference 'A' above.

Please be advised that authority to conduct research titled, **'Adoption factors influencing Human Capital Analytics among Human Resource Professionals in Zimbabwean State Universities'** at Zimbabwe Open University, has been granted.

Upon completion, we request you to submit a copy of your research to the Registrar's Office.

Thank you,

MR T.A. KASEKE
REGISTRAR

House Number 1105
Senga KMP
Gweru

12/07/2021

Permission to conduct a research study has been granted

The Deputy Registrar
Manicaland State University of Applied Sciences
P.Bag 7001 Vumba Road
Mutare

MANICALAND STATE UNIVERSITY
OF APPLIED SCIENCES
HUMAN RESOURCES OFFICE
19 JUL 2021
P BAG 7001
MUTARE

7/16/24

Dear Sir

REFERENCE:PERMISSION TO CONDUCT A RESEARCH STUDY

My name is Kebiat Mukuze a staff member at Midlands State University,Faculty of Social Sciences,Department of Human Resource Management.Iam studying for a Doctor of Philosophy in Human Resource Management(DPhil HRM) in the School of Entrepreneurship and Business Management at Chinhoyi University of Technology(C19140319D).Iam seeking permission to do research at Manicaland State University of Applied Sciences.Thesis title is:***"Adoption factors influencing Human Capital Analytics among Human Resource Professionals in Zimbabwean State Universities"***.Find attached hereto ethical clearance letter from Chinhoyi University of Technology.The study will contribute to the discourse on human capital analytics in tertiary institutions in Zimbabwe and the research candidate would acquire critical skills vital for solving societal problems.The research will entail collecting data from Human Resource Department staff and other users of Human resource services.I request permission to get access to Human resources database.

Respondents will be asked to give their written or verbal consent before the research begins. Their responses will be treated confidentially,their names and the name of the organisation will be anonymous unless otherwise expressly indicated.Individual privacy will be maintained in all published and written data resulting from the study.The results will be communicated in the final thesis.There are no foreseeable risks in participating in this study.I therefore request permission in writing to conduct my research at your organisation.Please let me know if you require any further information. I look forward to your response as soon as is convenient.

Yours sincerely,

Kebiat Mukuze(Mr.)

Contact Cell Numbers:0775 807 624/0717 886272

Email addresses:mukuze16@gmail.com/mukuzek@staff.msu.ac.zw

Lupane State University
Building Communities through Knowledge

Lupane State University Campus
1st Faculty of Agricultural Sciences Building
LUPANE
Postal Address: P O BOX AC 255
BULAWAYO
Tel: +263-0389-261, 269
E-mail: jmakunde@lsu.ac.zw, registrar@lsu.ac.zw

REGISTRAR'S OFFICE

20 May 2021

Dear Mr Kebiat Mukuze

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY

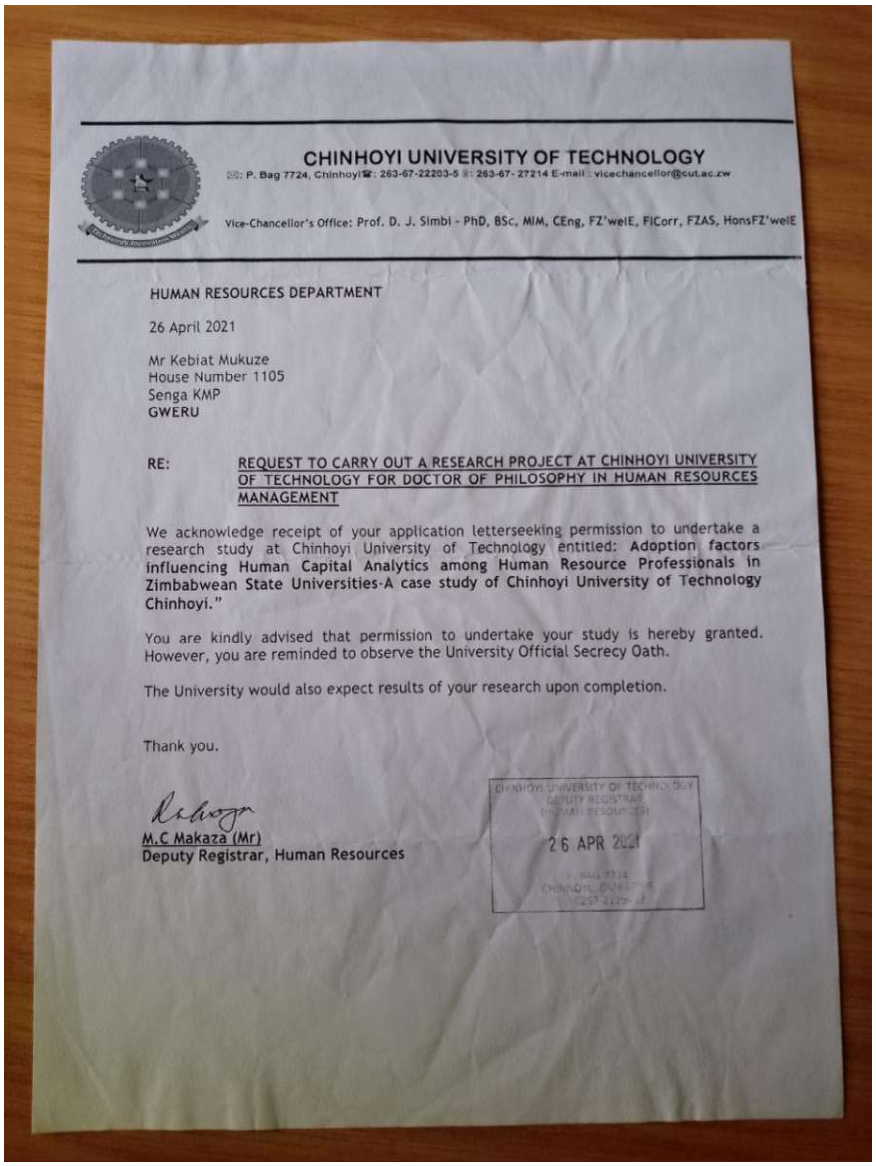
The above subject refers.

This letter serves to grant you permission to carry-out your research for PhD on ***"Adoption factors influencing Human Capital Analytics among Human Resource Professionals in Zimbabwean State Universities."*** You are authorised to conduct your research among the Lupane State University community.

Thank you.

LUPANE STATE UNIVERSITY
REGISTRAR'S OFFICE
20 MAY 2021

J Makunde
UNIVERSITY REGISTRAR
cc: Running File



CHINHOYI UNIVERSITY OF TECHNOLOGY

P. Bag 7724, Chinhoyi ☎: 263-67-22203-5 ℻: 263-67- 27214 E-mail : vicechancellor@cut.ac.zw

Vice-Chancellor's Office: Prof. D. J. Simbi - PhD, BSc, MIM, CEng, FZ'weIE, FICorr, FZAS, HonsFZ'weIE

HUMAN RESOURCES DEPARTMENT

26 April 2021

Mr Kebiat Mukuze
House Number 1105
Senga KMP
GWERU

RE: REQUEST TO CARRY OUT A RESEARCH PROJECT AT CHINHOYI UNIVERSITY OF TECHNOLOGY FOR DOCTOR OF PHILOSOPHY IN HUMAN RESOURCES MANAGEMENT

We acknowledge receipt of your application letterseeking permission to undertake a research study at Chinhoyi University of Technology entitled: **Adoption factors influencing Human Capital Analytics among Human Resource Professionals in Zimbabwean State Universities-A case study of Chinhoyi University of Technology Chinhoyi."**

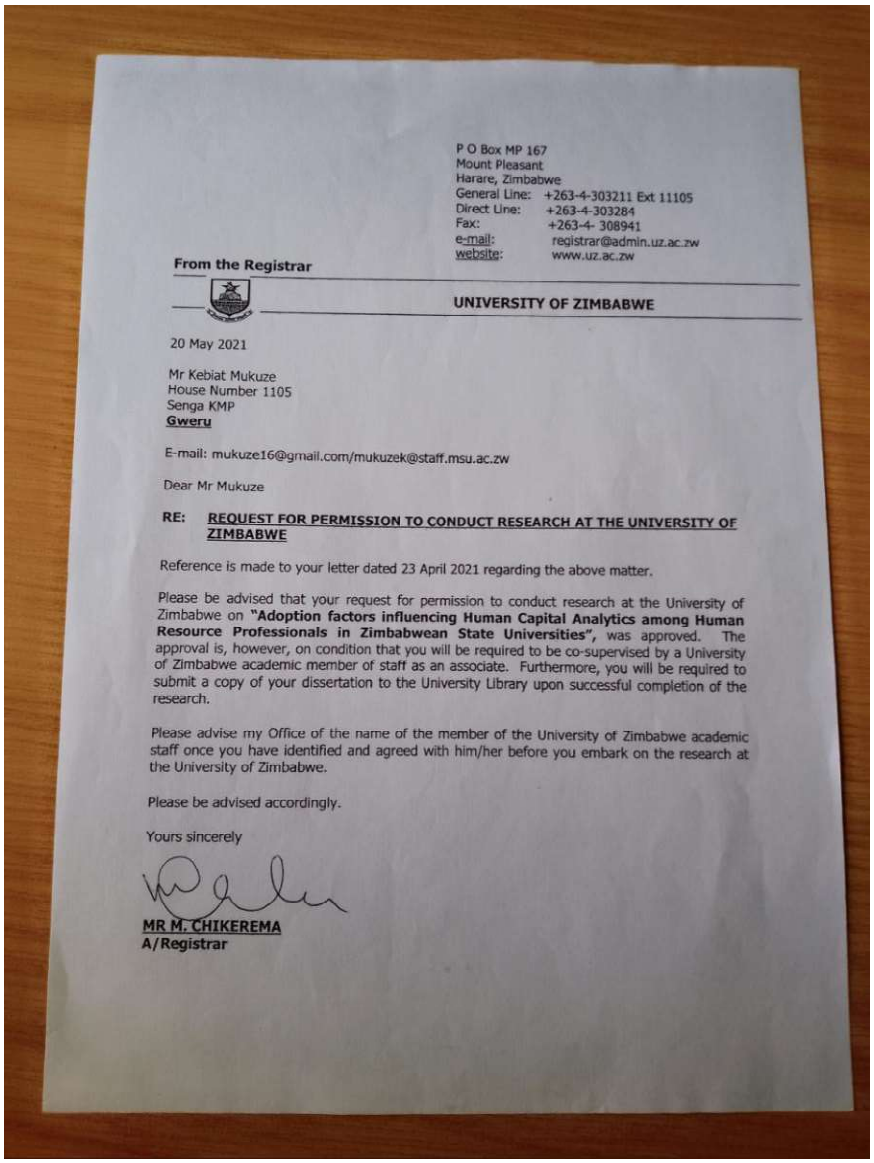
You are kindly advised that permission to undertake your study is hereby granted. However, you are reminded to observe the University Official Secrecy Oath.

The University would also expect results of your research upon completion.

Thank you.

M.C Makaza (Mr)
Deputy Registrar, Human Resources

CHINHOYI UNIVERSITY OF TECHNOLOGY
DEPUTY REGISTRAR
(HUMAN RESOURCES)
26 APR 2021
P. BAG 7724
CHINHOYI ZIMBABWE
TEL: (067) 22203-5



P O Box MP 167
Mount Pleasant
Harare, Zimbabwe
General Line: +263-4-303211 Ext 11105
Direct Line: +263-4-303284
Fax: +263-4- 308941
e-mail: registrar@admin.uz.ac.zw
website: www.uz.ac.zw

From the Registrar

UNIVERSITY OF ZIMBABWE

20 May 2021

Mr Kebiat Mukuze
House Number 1105
Senga KMP
Gweru

E-mail: mukuze16@gmail.com/mukuzek@staff.msu.ac.zw

Dear Mr Mukuze

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT THE UNIVERSITY OF ZIMBABWE

Reference is made to your letter dated 23 April 2021 regarding the above matter.

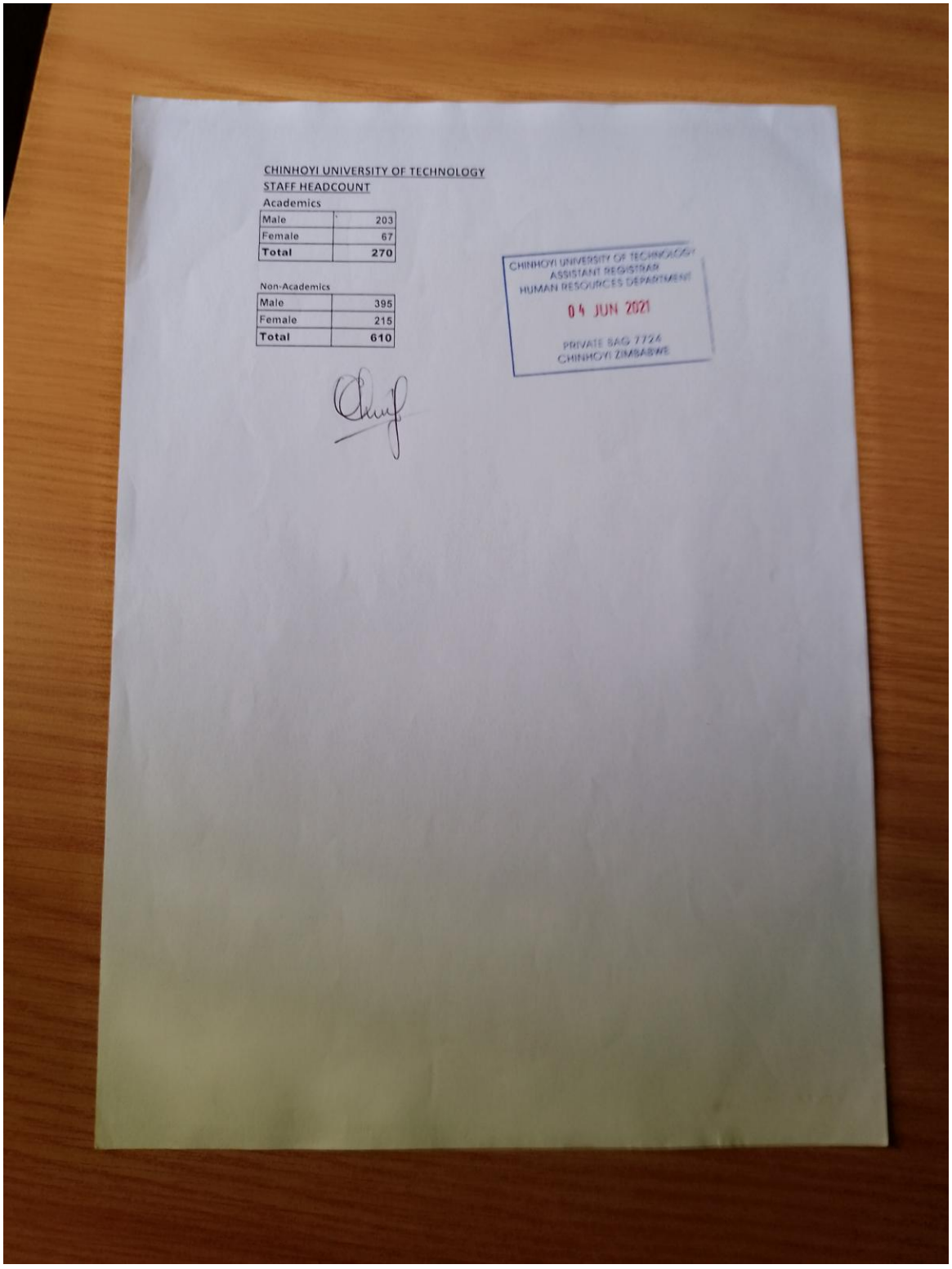
Please be advised that your request for permission to conduct research at the University of Zimbabwe on **"Adoption factors influencing Human Capital Analytics among Human Resource Professionals in Zimbabwean State Universities"**, was approved. The approval is, however, on condition that you will be required to be co-supervised by a University of Zimbabwe academic member of staff as an associate. Furthermore, you will be required to submit a copy of your dissertation to the University Library upon successful completion of the research.

Please advise my Office of the name of the member of the University of Zimbabwe academic staff once you have identified and agreed with him/her before you embark on the research at the University of Zimbabwe.

Please be advised accordingly.

Yours sincerely

MR M. CHIKEREMA
A/Registrar



CHINHOYI UNIVERSITY OF TECHNOLOGY

STAFF HEADCOUNT

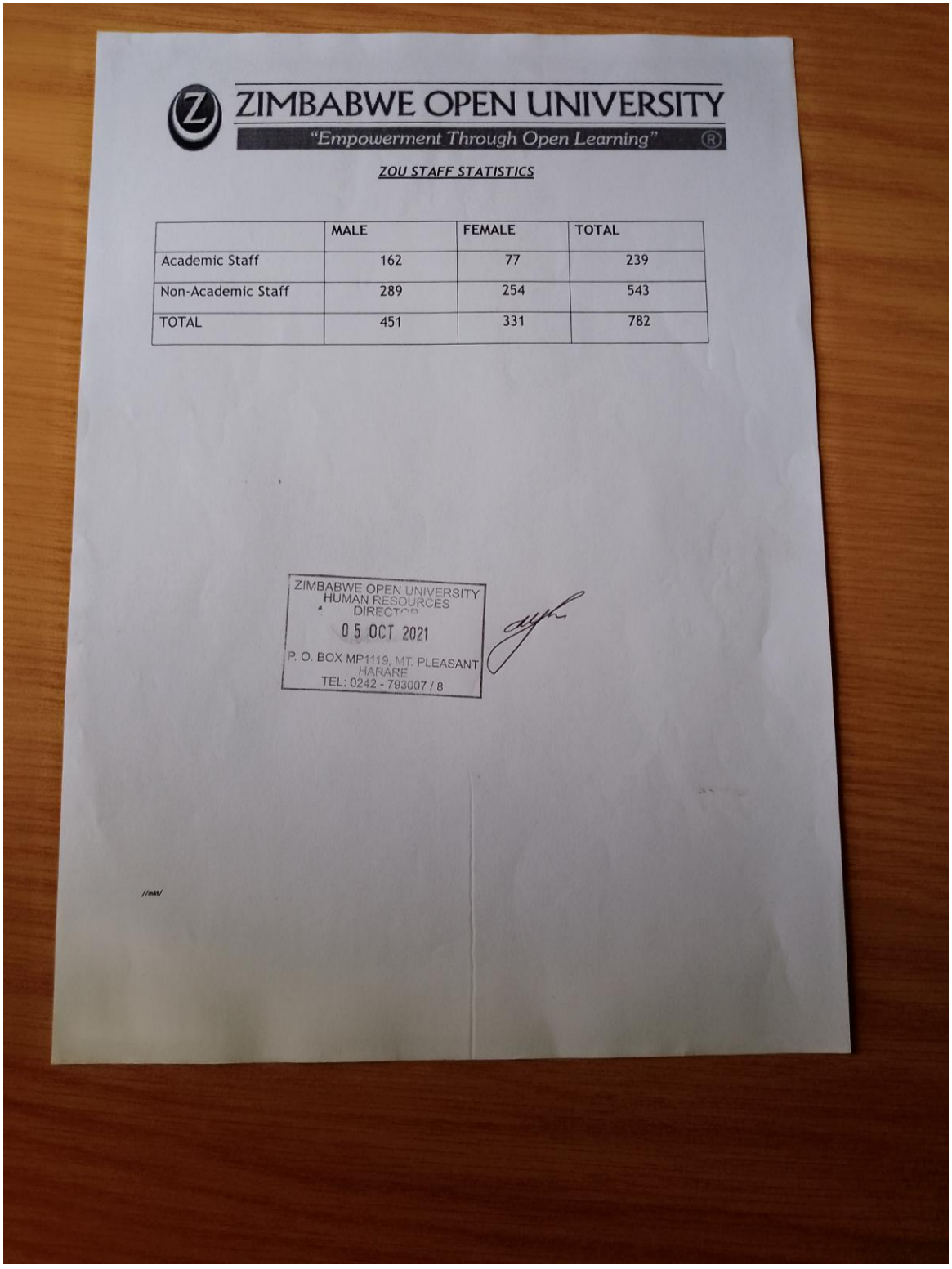
Academics

Male	203
Female	67
Total	**270**

Non-Academics

Male	395
Female	215
Total	**610**

CHINHOYI UNIVERSITY OF TECHNOLOGY
ASSISTANT REGISTRAR
HUMAN RESOURCES DEPARTMENT
04 JUN 2021
PRIVATE BAG 7724
CHINHOYI ZIMBABWE



ZIMBABWE OPEN UNIVERSITY

"Empowerment Through Open Learning" ®

ZOU STAFF STATISTICS

	MALE	FEMALE	TOTAL
Academic Staff	162	77	239
Non-Academic Staff	289	254	543
TOTAL	451	331	782

ZIMBABWE OPEN UNIVERSITY
HUMAN RESOURCES
DIRECTOR
05 OCT 2021
P. O. BOX MP1119, MT. PLEASANT
HARARE
TEL: 0242 - 793007 / 8

//mkl/

1. UNIVERSITY ESTABLISHMENT

Category	Total Establishment	In post	Vacancies	Vacancy rate %
Teaching	1077	725	352	14.5
Non-teaching	1350	1032	318	13.1
Total	2427	1757	670	27.6

Gender Profile

Gender	Teaching Staff	Non-teaching staff	Grand Total
Male	454	524	978
Female	271	508	779
	725	1032	1757

APPENDIX 10: KEY INFORMANT RESULTS CONFIRMATION

CONFIRMATION OF STUDY RESULTS

Inbox

Josphat Chirindo <joechirindo@gmail.com>
to me

Good afternoon Mr Mukuze.

Thank you for your email.

After going through your research findings sent to me, I can confirm that they are a true reflection of my

Regards

Josphat

Josphat Chirindo
Cell 0772925760

Watsapp: 0715361484

Skype: joechirindo@gmail.com

Kebiat Mukuze <mukuze16@gmail.com>
to Josphat

Thank you for the feedback.

11/03/23, 11:30 - Messages and calls are end-to-end encrypted. No one outside of this chat, not even WhatsApp, can read or listen to them. Tap to learn more.

26/04/23, 14:03 - Ngoma Pedzaruvengo: DOC-20230424-WA0026. (file attached)

KEY INFORMANT INTERVIEWS-RESULTS.docx

26/04/23, 17:41 - Mr Rusike@MSU: Thank you for contacting Rusky & Brands Entrepreneurs, Human Capital & Labour Consultants(Zimbabwe)! Please let us know how we can help you.

26/04/23, 21:06 - Mr Rusike@MSU: I have no objections to my input Mr Mukuze.I validate it as true submission on my part.Wish you well in your soon Doctorate road, remember to pick me up.God bless you