A diagnostic model for adoption of Human Resources analytics in local subsidiaries: Study focused on Multi-National Enterprises (MNEs) in Sub-Saharan Africa.

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Abstract

Front-line managers and HR practitioners are principal implementers and gatekeepers of HR practice in organisations and as such, the survival of HR analytics is dependent on their concerted effort to enable it. HR analytics is one of the concepts that organisations can use to become more efficient and effective and to ultimately survive. Whilst the field of HR analytics presents opportunities it is, unfortunately, fraught with several internal and external challenges starting with the alignment of key actors perceptions. This research focuses on the predictors of the degree of adoption of HR analytics.

In this research, extensive literature was reviewed to identify which constructs best apply in the context of the sampled subsidiaries of MNE organisations. A quantitative study carried out using a survey monkey questionnaire in which data from 256 front-line managers and HR practitioners in the subsidiaries of 6 Multinational Enterprises was collected. From the study, a model was developed that shows the best predictors for the level of adoption of HR analytics.

Findings confirm that dimensions such as organisational culture, the organisation's strategy and national culture are significant predictors for the level of adoption of HR analytics and its effectiveness. Also, from the study, the alignment of perception and trust on the role of HR analytics in the organisations between key actors was found to be instrumental to its success. Such a model is important for organisations to be able to leverage HR analytics investments and for decision-making

Keywords

[HR Analytics, Adoption, Organisations, Line Managers, Decision Making]

Declaration

I declare that this research project is my own work. It is submitted in partial fulfillment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other university. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Name: Kenneth Wanyoto

Signature:

Date: 7 November 2016

With the declaration, the Turnitin submission report must be included.

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1. INTRODUCTION TO THE RESEARCH PROBLEM

1.1 Introduction

Big data or analytics are now common concepts ubiquitous in management and academic literature and especially so in relation to high-performing organisations in the developed world (Falletta, 2014; Angrave, Charlwood, Kirkpatrick, Lawrence, & Stuart, 2016). The market for Human Resource (HR) Technology in 2014 in the USA alone was in excess of $15 Billion, with Learning Management Software deals in excess of $800 Million (Bersin, 2015; Deloitte, 2015). This rise recognises that Information Technology has a profound effect on HR processes, practices and in the organisations' survival. Many researchers also agree that HR analytics shows promise to act as a foundation for competitive advantage and can also elevate the bashed HR professionals image for organisations that put it to good use (Chugh, 2014; Stone, Deadrick, Lukaszewski, & Johnson, 2015; Bassi, 2011). This good use can, however, be ascertained by evidence hence the increasing call for Evidence-Based Management in support of HR functionality in organisations (Falletta, 2014).

While in the developed world software technology has evolved into "general purpose technology" and its adoption a key enabler for the technological readiness of a range of countries (WEF, 2014; Schwab, Sala-i-Martin, & Brende, 2015), in emerging markets, it is uncertain that the HR professionals are able to access data and use it to make accurate decisions to solve business problems (Jones, 2014). The dilemma for any organisations attempting to implement an HR Analytics strategy is that the business environment is fraught with a plethora of challenges and inhibitors ranging from the misalignment of the HR role of front line managers, lack of trust, (Najeeb, 2013) (Qadeer, Shafique, & Rehman, 2011) and other inhibitors prevalent in Emerging Markets such as inadequate infrastructure, lack of key skills, limited resources and institutional voids manifested as the absence of; regulatory systems, specialized intermediaries, and contract-enforcing mechanisms (Khanna, Palepu, & Sinha, 2005). Further, the low level of technology readiness of the economies of the emerging market organisations is rendering the businesses uncompetitive relative to their peers in the developed world (Schwab, Sala-i-Martin, & Brende, 2015). However, as shown later in the study, an emerging strand of research explores how aspirational organisations are charting the path to evidence-based decision-making with the use of HR Analytics.

1.2   Background

At the organisational unit of analysis level, the HR function lags behind other functions in the business in applying analytics (Harris, 2011). If HR does not address the potential and pitfalls of analytics, the function itself is bound to fail (Angrave et al., 2016). Further, although extant literature highlights the significance of the relationship between Line and HR (HRL), the front-line manager's role is not amplified enough in light of its increasing importance in the success of the Human Resources Management (HRM) activities and the fact that these HR responsibilities are also increasingly being devolved to line managers (Qadeer et al., 2011). Every line manager is accountable for HR management in addition to their basic responsibilities for as long as they have someone reporting to them. The line manager and HR department's authority is, therefore, intersecting and it is evident and if this is not managed well it could lead to catastrophe in the implementation of HR practice (Najeeb, 2013).

Even further, in the same HR field, there is a disparity between organisations in the developed world and those in emerging markets in Information Technology adoption. This occurrence has been labeled the "digital divide" (Okunoye, 2003; Kyem, 2012; Wamboye, Tochkov, & Sergi, 2015). Therefore while organisations in the First World continue to become more sophisticated and leverage HR analytics to achieve business goals through drawing on employee data insights at an escalating pace, the companies operating in emerging markets run the risk of becoming further disadvantaged.

1.3   Research Objectives

The research purpose is to determine the most influential factors determining the effectiveness of HR analytics adoption in subsidiaries and also highlight the role of the under-recognised front line managers in implementing HR practice. In summary:-

1. Establish which key drivers/ contingency factors are associated with the level of adoption of HR analytics adoption in the subsidiaries.
2. Assess which factors identified above display stronger predictive characteristics
3. Establish what inhibits HR analytics from an HR practitioner's perspective
4. Make recommendations on how to improve adoption of HR analytics in organisations in Sub-Saharan Africa

1.4   Research Scope

The investigation focused on perceptions of two out of three key stakeholder groups that directly impact this topic in question (namely; human resource team and line managers) as these two groups exercise control over the inputs to the HR analytics processes while employees are considered consumers of the management processes. This study was carried out in thirteen countries in Sub-Saharan Africa.

1.5   Research Motivation

The HR analytics field shows promise of bringing value to the table and lifting the credentials of HR resource teams. It' growing popularity brings with it a means of increasing business efficiencies and competitiveness. The aspiration of this study is to focus on the line manager who is arguably the most important stakeholder in influencing an employee's performance output and the study also focuses on subsidiaries given their unique challenges in managing local adoption of innovative practices mandated by Head office. This study attempts to close an academic gap and also provide some policy recommendations for the business community. Extant research on HR analytics in the developed world has thrown light on some factors influencing it, such as organisation size, organisation age, the labour-capital ratio (Dooren, 2012) but mostly ignoring discussing how to identify the most influential factors and also ignoring highlighting the changing role of front line managers with increasing devolution of HR practices which are also evolving like with HR analytics. Literature also largely ignores the role of the external cultural environment and the role of institutions on levels of diffusion of the innovative practice of HR analytics.

In this research, we draw on some frameworks that could complement each other: resource dependency theory (RDT), stakeholder theory (ST) and institutional theory (IT). In line with RDT, it is a contention that some factors related to home country perceptions could be relevant in influencing the adoption of HR analytics and level of adoption. Institutional Theory could also lead us to a contention that the perception of gaps due to the lack of institutional frameworks by line managers could influence their decision to adopt HR analytics (HRA) in an organisation.
Stakeholder theory in its descriptive nature supports the study by describing what specific corporate managers characteristics are such as, interests and behaviour. This can assist us when we are explaining the outcome of the study.

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2. LITERATURE REVIEW

2.1 Introduction

The needs of business and academia have been served extensively by a legacy data management concept for more than two decades and helped solve problems and facilitate decision making (Bisbal, Lawless, & Grimson, 1999). However, more recently as technology has moved forward at an accelerating pace, the increasing amounts and types of data have opened up new prospects for firms to better understand their businesses, their customers, and their environment, resulting in an increase in uptake of sophisticated methods of extracting value from data (Ransbotham, Kiron, & Prentice, 2015). At a global level there are several uses of big data and analytics as applied in fields ranging from tax administration in OECD countries (FTA Advanced Analytics Network, 2011), to geo-mapping (Cinnamon & Schuurman, 2013) and many other fields such as in the social media (Edosomwan, Prakasan, Kouame, Watson, & Seymour, 2011) where it is having an impact.

In contrast , the HR function has long envied peer functions like marketing where the potential usefulness of big data to support marketing decisions and to execute marketing campaigns has generated lots of value and interest (Hofacker, Malthouse, & Sultan, 2016). Many scholars have probed the unique set of circumstances presented to businesses and highlighted key concepts like the institutional voids as aligned with the institutional theory that are holding back organisations from applying modern business management technology and techniques such as HR Analytics (Khanna et al., 2005). A short journey through pertinent literature as per the structure in figure 1 below is proposed.

Figure 1: Structure of the literature review.
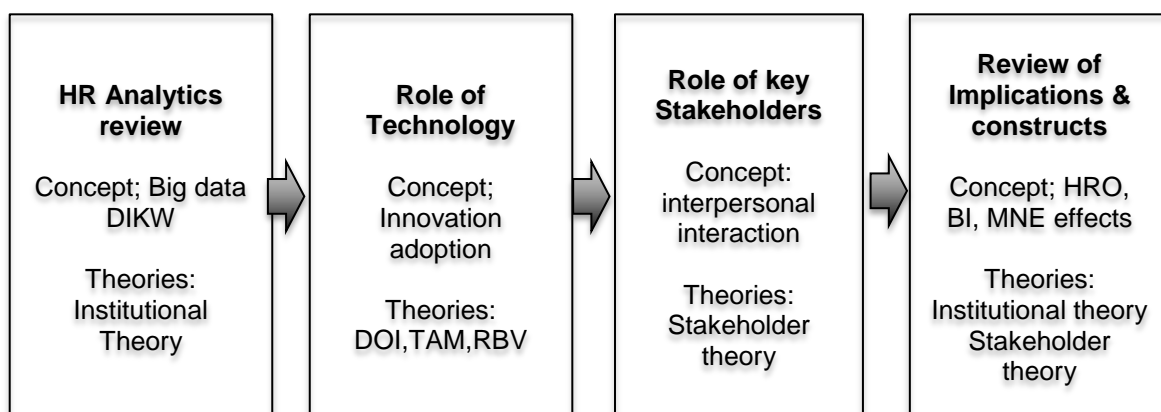
2.2 HR Analytics review:

2.2.1 HR Analytics Concepts Clarified

Earlier definitions positioned the concept of big data as anything that is too large for the usual database tools to capture, store, manage and analyse however more recent positioning is moving from the data size argument to smartness (Angrave et al., 2016). The more recent definitions best represent the notion with three characteristics i.e. volume, velocity, and variety of data which distinguish big data from the traditional descriptions of data. More recently a fourth V i.e. 'Value' has become the integrating factor of big data (Batra, 2014).

Employees much like consumers are incessant creators of structured and unstructured data hence through HR analytics exciting opportunities exist for processing of this data thereby enabling managers and enterprises to develop algorithms and implement predictive modeling to facilitate better strategic decisions in real time (Hofacker et al., 2016). Big Data Analytics aims to find patterns from accumulated historical data and derive insights from the same to guide future actions. This analysis of data is the backbone to the hierarchy of Data, Information, Knowledge and Wisdom (the DIKW hierarchy) and a conceptual contribution to the Knowledge Management discipline (Batra, 2014)

In recent times digital and social technologies impact practically all and sundry in the developed world, notwithstanding their type of employer, occupation, their department, line of business, or phase in career (Shelton Hunt, 2014). HR management has been transformed by these technologies; from talent management through key functions such organisational design, learning and development, performance management, and compensation to practically management of the entire employee's life cycle. The evolution of the HR function is unprecedented in both high-tech and high-touch ways.

In stark contrast, the several organisations are lagging behind. Several authors cite various dimensions at play and highlight the role of various stakeholders and institutions at a National, Organisational and Individual unit of analysis level ranging from institutional voids (Khanna et al., 2005), ICT infrastructure availability, Internet access, resources, skills, culture, tradition (Kyem, 2012), adoption rates (Oke, Walumbwa, Yan, Idiagbon-Oke, & Ojode, 2014). Most of these dimensions were tested further in this study.

2.2.2   Role of Technology

Literature highlights the role that the Technology Acceptance Model (TAM) plays in the adoption of a key technological innovative practice such as HR Analytics and raises the elements of 'perception of usefulness" and "ease of use" which are underpinned by the Theory of Reasoned Action (TRA) (Jose, 2015). Other scholars have gone further and raised the importance of incentives and their alignment in encouraging this acceptance (Aziz & Idris, 2016). This research attempts to expand our horizon further to identify the role of other key elements that determine the effectiveness of any innovation adoption over and above the role that TAM plays as shown in the overall innovation adoption framework shown in the figure below.

Figure 2: Conceptual framework for determinants of the innovation adoption process.

The innovation adoption process
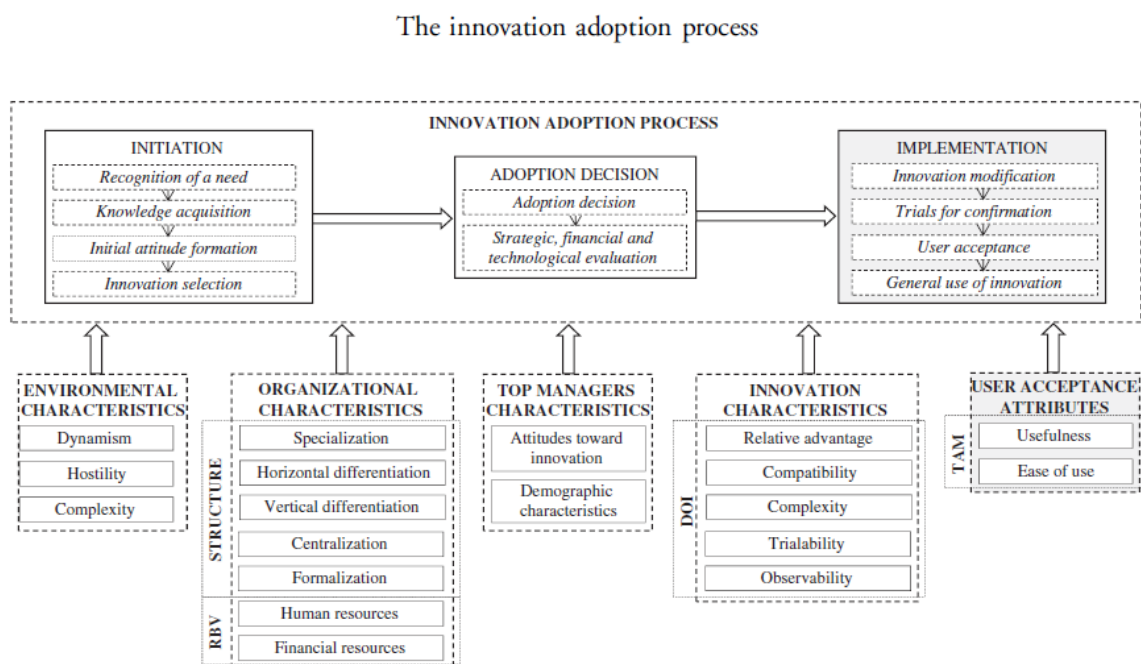
Source: Pichlak, Magdalena (Silesian University of Technology, Zabrze, 2016)

Literature, therefore, underscores the importance of a much broader evaluation to explore further and understand the elements affecting the adoption of innovative practices such as HR Analytics.

2.2.3   Role of Line managers

The philosophy that is advocated by many scholars in terms of an effective HR operating model is one where the power relationship between line managers and HR involves devolution of the HR role to line managers as a critical factor for its success. It is believed HR Management (HRM) should not be left only to HR practitioner and is therefore shared. In principal front-line managers are regarded as the most appropriately placed stakeholders to actively manage their employee's performance (Qadeer et al., 2011)

There are several debates about amongst scholars about how the different levels of interaction amongst managers within their respective functions/ levels can affect the shape or form and roll out of Hr practices. The scholars go further to point out that where the significance of a common and positive understanding of the core objectives of the HR practices without which could lead to failure (Najeeb, 2013)

In light of the challenges of HR role devolution, one of the key factors inhibiting complete devolution to line managers from a high-level perspective is the divergent standpoints among HR and line managers. While line leaders consider themselves proficient in HRM their HR colleagues repeatedly proclaim that the line leaders try and evade the hard HRM tasks which shows a perceptual gap between the two groups.(Qadeer et al., 2011)

Even though HR devolution is a well-intended practice, it is very difficult to get it right and as such effective transfer of HR responsibility is not obvious. A couple of possible difficulties that are cited include the incidence of role stressors, i.e. sensitivities around role obscurity and role burden as factors that contribute to the negative consequences (Gilbert & Winne, 2011), however, the perception gap is regarded as a major obstacle to success. (Qadeer et al., 2011)

In summary, the literature highlights the expectation that by extension the more recent HR practice of HR analytics will be received with differing perceptions between the two stakeholder groups of Front-line managers and HR practitioners.

2.2.4 Implications for Organisations

The main driver for organisations to adopt innovative practices such as HR Analytics is to do business in a more efficient and effective manner and as such one key implication is the increasingly popular use of the Human Resource Outsourcing (HRO) model which to a large extent is enabled by HR Analytics.

The trend to outsource parts of human resource rose rapidly as represented by a global HRO market valued at $26.8 billion in 2006 and was expected to get to $43.7 billion by 2011 (Butler, Carolyn, & Smith, 2010). This trend which is skewed to the developed world and minimal in emerging markets, has led to the emergence of many categories of service providers including human resource intermediaries (HRIs), who focus on delivering HR services to organisations needing the benefits of HR outsourcing which to a large extent is enabled by HRIS (Kock, 2012). Firms interest in outsourcing is largely driven by the benefits of reducing costs, improving service quality, and enhancing core competency (Butler et al., 2010).

Other significant implications internal to companies demonstrate that HR analytics is a key pillar in the broader business intelligence (BI) field that can allow companies to integrate the employee skills base, with the technology platforms, with other and organisational processes to make deliberate, calculated and enhanced business decisions which could enable them to out-compete their peers (Kapoor, 2010). As such companies can compete on BI not because they can but because they should. There are several examples are cited that include the gathering of employee data on skills and other attributes such as education or past performance that help companies identify the talent that is critical to its ambitions and enables it to better plan its talent retention initiatives. Such data can be stored in similar or disparate systems in horizontal and vertical architectures covering the majority of HR functions (Kapoor, 2010).

However, HR analytics runs a risk of not connecting with the business and becoming a management cliché because it often takes an internally facing, academic approach that misses the core of business which is about customer centricity and not just focusing on efficiency driven Centres-of-Excellence (CoE) that could disconnect HR from the business. A reversal of this approach is necessary to an "outside-in" line of attack with a focus on more relevant findings and interventions with high impact. This would move HR analytics out of HR and integrate it with the overall end-to-end business processes (Rasmussen & Ulrich, 2016).

2.2.5 Transnational Effect

Literature has shown clearly that competitive advantage can be achieved with effective management of knowledge and especially so for MNE firms, as they adjust their business strategies for subsidiaries to cater for the local market conditions while expanding abroad (Senoo & Watanabe, 2010).

As proxies of organisations that would benefit greatly from improved HR practices like HR analytics, Multinational Enterprises (MNEs) find themselves dealing with local context and cultural distance mediating factors. As such, a number of scholars agree that the active management of practice adaptation is necessary to promote adoption and broader dissemination of management practices with some going even further to raise the environmental dimensional mismatches that could trigger diverse configurations of strategies among the subsidiaries (Ansari, Reinecke, & Spaan, 2014). Hence with this background, it is important to note that HR Analytics need to be modified intra-organisationally to suit the business strategy and then permeate the membranes of the organisations (Canato, Ravasi, & Phillips, 2013).

The paradox is that on the one hand, subsidiaries are likely to find differences in fit between the HR practice and organisational context as they engage and intermingle with the practice. And since they are not sovereign entities, they end up finding that they are mandated by the corporate parent to adopt the practice, which is sometimes stated as 'coercive isomorphism' driven by the corporate parent. On the other hand, the MNEs are dealing with complex internal settings, cultural dissimilarities, linguistic obstacles and power struggles between business units all of which require local variations of a practice to succeed (Dacin, Kostova, & Roth, 2008).

Adaptation can be a two-edged sword as both excessive or slight adaptation can be considered detrimental (Pierce & Aguinis, 2013). If an MNE is too restrictive and does not allow a subsidiary autonomy, it risks adoption becoming superficial, representing ceremonial imperatives or it may even lead to decoupling. Therefore, to accommodate local needs, the MNCs need to create engagement and support the subsidiary by providing some latitude to adapt practices (Ansari et al., 2014).

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2.3 Constructs Review

2.3.1 Context and HRA Strategy

In accordance with legacy, HR function was not considered core to business function and only in the last two decades did organisations begin to offer HR a seat at board level (Am & Abel, 2012). In line with Agency theory, this perceived lack of strong leadership to act as an agent at board level to argue the case for HR analytics is relevant to the current positioning of HR Analytics in organisations.

The Human Resources function has traditionally been viewed by executives as more of a cost centre, and less of a strategic asset within their companies (Kapoor, 2010). Studies underscore this argument as they reveal the general lack of analytical thinking and HR Analytics strategy in most organisations globally (Angrave et al., 2016). With the general lack of an agreed HR analytics strategy, it follows in line with Resources Based View theory that allocation of scarce resources becomes even more difficult. A popular model for delivery of efficient and effective HR practice today is via the HR Business Partnership Model. This model which is ideally lower cost and higher value than previous traditional HR models comprises:-

1. Corporate HR.
2. Centres of excellence/ expertise.
3. HR Business partners with line managers.
4. Service Centres.

HRIS platforms driven through the service centre act as an enabler for the model to be efficient as they address the transactional activities of the model (Kock, 2012). However, despite making a lot of progress in many areas of HR-related technology, the human capital function still has not yet claimed significance as a true business partner (Am & Abel, 2012). Yet with better structures and analysis business leaders should be able to extract value from this increasing popular HR practice (Am & Abel, 2012).

Further, there are usually not enough resources allocated to HR in organisations to drive the HR analytics agenda (Harris, 2011). Any crises such as the Global Financial Crisis in this volatile uncertain complex and ambiguous (VUCA) world will have a negative impact on company's financials and with the popular resource based view cognitive frame of mind thinking, most businesses will respond with cutting HR resource budgets.

Figure 3: A road map for the implementation of HR analytics.
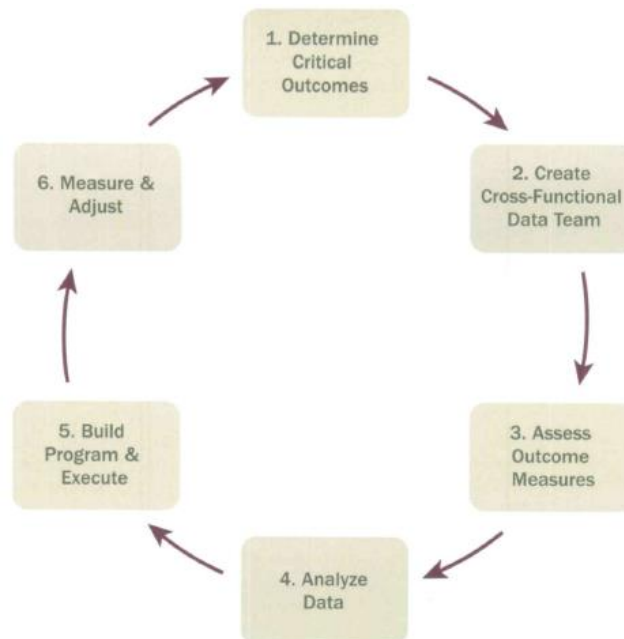
Source: (Mondore, Douthitt, & Carson, 2011).

2.3.2   HR Analytics Skills & Competence

(D. Ulrich, Younger, Brockbank, & Ulrich, 2013) through a study implemented globally have highlighted how HR skills sets have evolved over five years and the study showed that HR practitioners need to become technology proponents today more than ever before as well as HR innovators to become effective. HR analytic skills represent an overlap of the above two competencies.

Figure 4: Simplified version of Dave Ulrich's competence model.
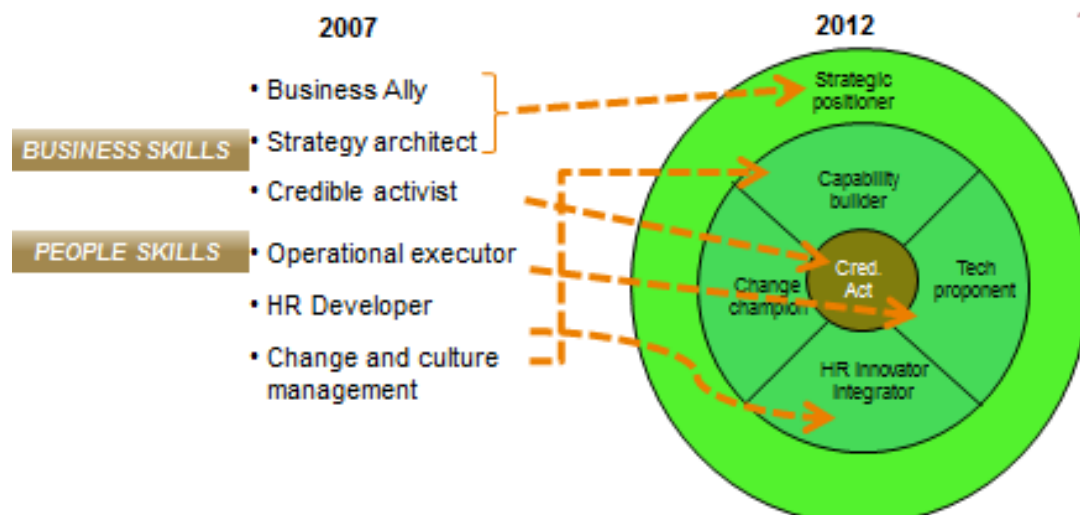
As discussed earlier (2.2.3) if HR analytics is required to be disseminated across the business then the skills required to effect it need to exist more broadly across the business.

Analytics sub-systems include analytic functions that require advanced statistical modeling that may come in many forms such as structural equation modeling, regression modeling etc. Employees that work in these roles require advanced skills in areas of Statistics or other related fields. This highlights that the competencies needed to run an HRIS function effectively are beyond what many institutions in emerging markets can provide. To availability of this calibre of talent comes a premium in some markets or is even lacking in others.

2.3.3   Infrastructure and Data Basics

Without adequate ICT infrastructure and good quality data, it is impossible to move to the lowest level of analytics. One scholar reminds us how the availability and currency of information (as enabled by an HRIS platform) is a key criterion in any organisation's performance and goes even further to show in Figure 5 how this influences the level of a "performance-directed culture" realised in an organisation (Dresner, 2010).

Figure 5: Performance Culture Maturity Model (Dresner, 2009).

	Alignment with Mission	Transparency and Accountability	Action on Insights	Conflict Resolution	Common Trust in Data	Availability and Currency of Information
Performance-Directed Culture Realized	Actionable and embraced mission —supported, informed, and reinforced by metrics	General transparency and accountability accepted as cultural tenets	"Closed loop" processes ensure timely, concerted action	Established and effective mechanisms for resolving conflicts	Data as truth: Common application of data, filters, rules, and semantics	Currency of metrics/data matches rhythm of business
Performance-Directed Culture Emerging	Actionable mission supported by "top-down" metrics	Limited transparency and accountability; multiple functions collaborate	Ad hoc (informal) action on insights across functions	When identified, conflicts resolved on an impromptu basis	Common data: Provincial views and semantics used to support specific positions	Enterprise availability, uneven currency of information
Departmental Optimization	Alignment with discrete functional goals, not enterprise mission	Fragmented transparency and accountability within discrete functions	Uncoordinated/ parochial action (sometimes at the expense of others)	Appearance of cooperation, "opportunistic reconciliation"	Conflicting, functional views of data cause confusion, disagreement	Availability and currency directed by departmental sources
Chaos Reigns	Mission not actionable, not communicated, and/or not understood	Arbitrary accountability, general opacity	Insights rarely leveraged	Conflicting, redundant, and competing efforts are the norm	Data and information generally unreliable and distrusted	Multiple, inconsistent data sources, conflicting semantics

2.3.4 Institutional Voids

Subsidiaries of MNEs carry out business in foreign host settings that have unique institutional profiles and the leaders of these business units must, therefore, strive to manage the challenges presented by the institutional settings while also meeting the requirements of the head office. The institutional gaps in the subsidiary markets can come in the form of weak regulatory systems, absence of specialized intermediaries, or mechanisms to enforce contracts in these markets which places them at a disadvantage and prevents businesses from achieving their strategies (Khanna et al., 2005).

In each market, it is important to map the institutional void and decide where and how it affects the business environment. HR analytics, for example, requires an environment for good HRIS software providers to maintain and support the industry. Given this field is relatively new and is evolving continuously, the providers of HR analytics are usually resident in the Developed World leaving users in the Emerging Markets at a disadvantage (Khanna et al., 2005).

2.3.5 Trust and Alignment

Several authors have observed that HR practices in the form of HR systems play a key role in creation and existence of trust in organisations. Practices like HR Analytics support process consistency, enhanced perceptions of fairness and procedural justice (Vanhala & Ritala, 2016).
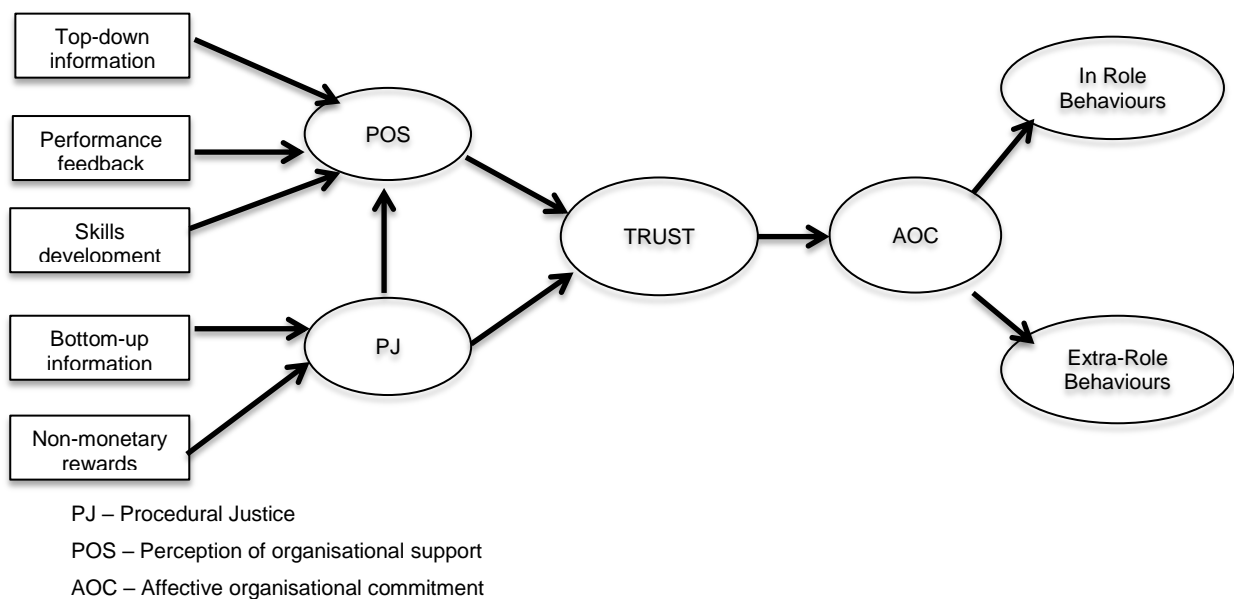
Organisational trust can come in two main ways; either as interpersonal (i.e. between managers/ supervisors and co-workers) and impersonal trust (organised systems). In this section, we shall concern ourselves with impersonal trust and how it relates to HR practice. Several authors highlight the role that Trust plays as a foundation for HR adoption of innovative HR practices such as HR Analytics. Some authors show how employee trust in the entire organisation is linked to opinions about the operational HRM practices and the authors further reveal such practices can be leveraged to build the impersonal element of organisational trust (Vanhala & Ahteela, 2011).

Social exchange theory has been noted as being an applicable framework in explaining the employment relationship. The rationale behind this theory is the norm of reciprocity: employees are required to show more exertion and allegiance in

response if the establishment demonstrates to its employees that they care, value and support them – especially where the employees perceive that the employer's actions are over and above normal employment contract expectations. This expression of care and support can be delivered through the organisation's HRM practices and systems such as the HRIS systems or HR policies (Vanhala & Ritala, 2016).

The mechanisms of delivery of the HRM practices are usually hierarchical i.e. from the top to lower levels and from below to levels above usually in the form of communication of information, building of skills, performance reviews and motivational rewards etc. all of which can be enabled and made easier to administer through HRIS and improve business outcome through HR analytics.

Figure 6:   Theoretical trust mediation model

PJ – Procedural Justice
POS – Perception of organisational support
AOC – Affective organisational commitment

Source (Tremblay, Cloutier, Simard, Chênevert, & Vandenberghe, 2010)

The researchers further observe that e-HRM employment approach could be strategic in the sense that it aligns well with the needs of the new talented Gen-Y.

To sum up this section we shall consider findings from (Ngoc Duc, Siengthai, & Page, 2013) that suggest that the relationship between HR analytics in the form of HRIS with Trust is a key contributing factor for managers to adopt HR Analytics in organisations to be effective. In the absence of competitive ROI computations to

justify HR analytics investment, the HR leaders need to lean on their ability to seek out and acquire trust and collaboration to execute an HR Analytics strategy

2.3.6 Competitive intensity

The paradox of competitive intensity is that on the one hand the increasing globalisation and declining market conditions in some parts of the developed world, is driving many corporates to shift to try and take advantage of emerging market region opportunities such as those associated with the 'Africa rising" narrative using their existing products and services which increases the competitiveness in these markets. On the other hand, these firms from the western world are finding that the analytical/ intelligence tools, data management techniques and tools prevalent in the Emerging Markets are dated.

It is also noted that an increase in competition is accompanied by a decrease in the marginal effect of density legitimation. Once the different audiences have accepted the organisational forms that operate in an industry, new entrants only introduce a competitive effect (Gómez, Orcos, & Palomas, 2014).

When the above theory is contrasted against a population ecology theory, it becomes clearer that the very survival of organisations is under threat. A central message of population ecology theory is the idea that firms within a given population compete for a limited set of resources (Hannan and Freeman 1977) which impinges on their life cycle. Further to this, the institutional theory also throws more light by explaining that the process of institutional isomorphic change will occur in organisations faced with the same environmental conditions as they tend to adopt similar processes and structures (Powell & DiMaggio, 1991). This view agrees with what other scholars suggest with regard to the forces that exist in an environment that encourage the convergence of business practices (Braunscheidel, Hamister, Suresh, & Star, 2011).

2.3.7 Organisational Culture and Motivation

Stakeholder theory reminds us to look at the connections between the key stakeholders who are identified in the study.

HR Team: to craft the HR analytics opportunity and lead the change.

Line managers: to adopt, manage the change and leverage the opportunities for individual and organisational performance

Employees – to embrace and exploit the opportunities presented.

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At the organisational unit of analysis level and between the above stakeholders, there are associations between adopted Human Resource Management practices and the extent of Human Resource Management results. Such results present and either perceived outcomes, actual outcomes or intended outcome. Negative consequences arise when these outcomes are mismatched.

An employee is usually the ultimate receiver of these practices and for the practice to be effective the employee's sensitivities need to be managed. To get the employee motivated to accept the new HR practice several scholars have highlighted the essential role HR credibility plays independently of climate (Stirpe, Trullen, & Bonache, 2013). Such climate needs to drive a healthy culture as it can impact the employees feeling, perceptions and reaction leading to the debate usually referred to as 'opening the black box' between Human Resource Management and performance (Farndale & HopeHailey, 2010). Scholars raise the importance of managing the corporate culture as a mechanism of building organisational capability   (B. D. Ulrich, Brockbank, Ulrich, & Kryscynski, 2015)**.** If we integrate this view with the point raised earlier about championing a pervasive HR analytics culture across the organisation we can argue therefore that a key need exists to build change management skills both within the HR and line managers domains.

Figure 7: HR Analytics Stakeholders

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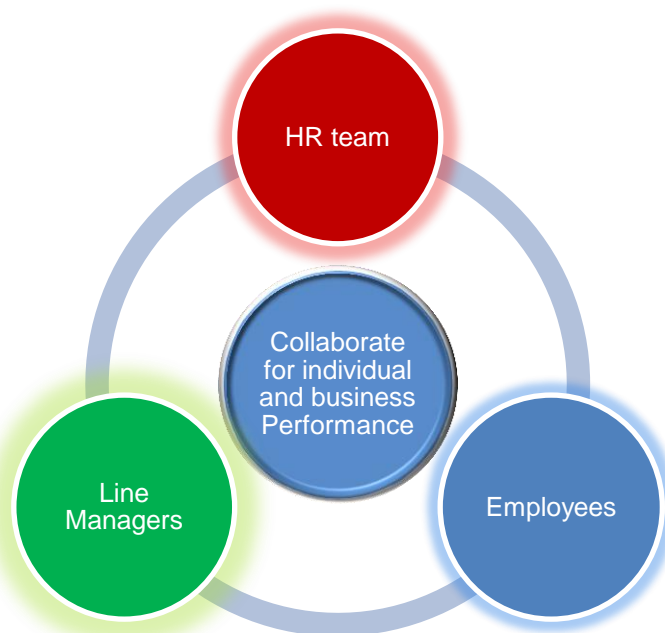
2.3.8 National Contextual Differences and its Impact

Previous research has shown that national culture can constrain and influence the nature of Knowledge Management and does not only depend on the organisational features of the firm but can also be restricted by the cognitive frame of mind of the managers drawn from the national culture (Senoo & Watanabe, 2010).

Various scholars discuss the issue of how a country's culture can affect HR policies and practices including how HR information is collected and processed while some go further to explore what this means to the values of work orientation (MVWO) as a dimension of national culture in influencing Human Resource Management practice and policy selections (Morley & Collings, 2004).

In some cases, the introduction of new technologies into traditional settings can be disrupting and engender diverse responses. A simple example of introducing a tractor could have ramifications for farmers who have to weigh costs of fuel, maintenance, operations against that of the local communal labour and possible ramifications related to land rights. Some traditions believe in face to face community meetings. This form of communication will clash in priority with some of the forms offered through modern e-learning systems like webinars, teleconference mechanisms etc.

Figure 8: Conceptual model of variables under investigation.
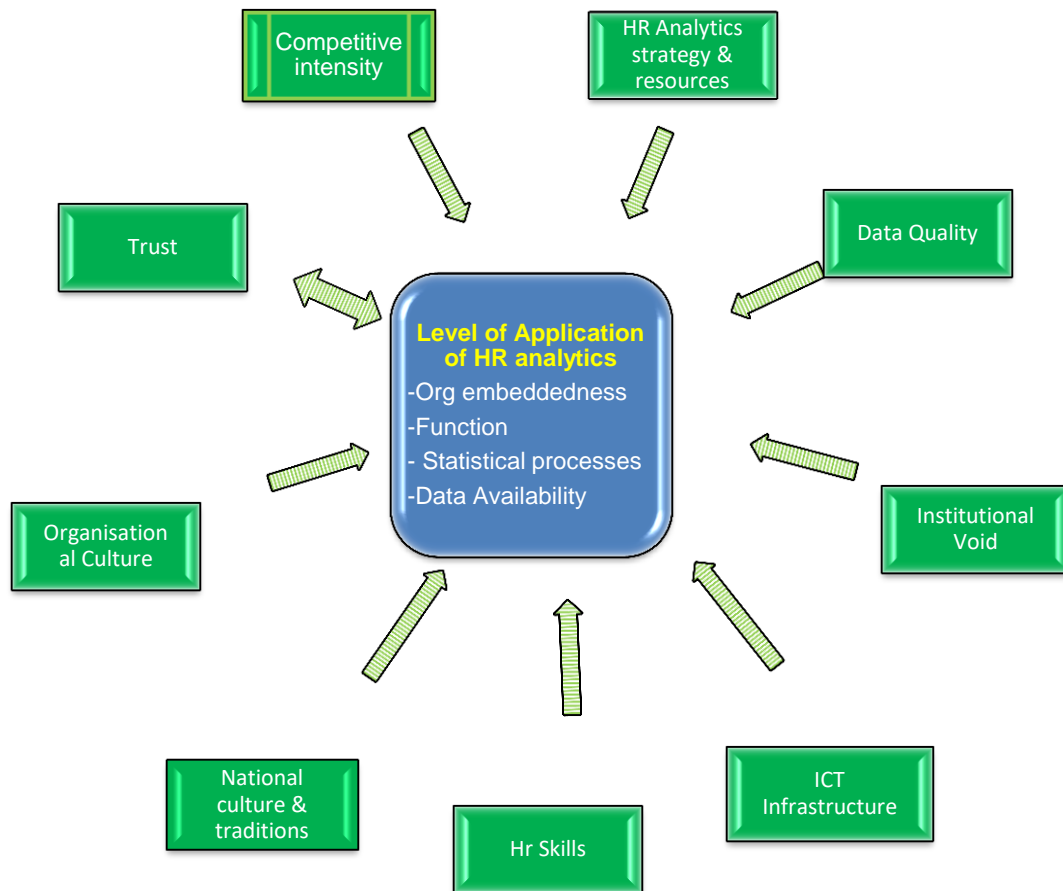
Source: Own model

2.4 Conclusion

In summary, the last section gave a review of the literature on HR analytics adoption. In the review, several independent variables (Figure 8) were noted as influential variables affecting the level of adoption of HR analytics. It was imperative however that the most influential of the independent variables would be identified and also that these variables would be investigated further to establish the level of relationship between them and also between them and the dependent variable.

Further, as highlighted within the literature it was discovered that line managers did not perceive HR practice as represented by HR analytics or its level of adoption in the same way that HR practitioners do. So it was found to be useful to test the population sample on whether their views as above would differ or would be the same.

3. PROBLEM STATEMENT

The study was aimed at establishing enablers and inhibitors that impact the adoption of HR analytics in subsidiaries and highlight opportunities present to leverage this HR practice in the local subsidiaries? The overall interest of the study was to understand which levers these organisation should focus on to get ahead fastest? The research questions (RQ) to be answered are:-

RQ 1: Establish the contingency factors impacting the adoption of HR analytics in MNE subsidiaries?

This question seeks to establish various factors influencing the degree of adoption of HR analytics by subsidiaries in the context of the sampled organisations.

The analysis was used to test the relationships between the elements identified as presented in the literature.

In answering the above question a sub-question was identified that supports reliability by testing if there was a difference in perception between HR practitioners and the line manager groups on the level of HR analytics adoption in their organisations.

RQ2 : Establish the factors that are the most influential predictors of HR analytics adoption?

In light of the relationship identified above this question seeks to identify which of the dimensions are the most influential predictors of effective HR analytics adoption.

Further analysis was conducted to isolate the most influential predictors of HR analytics adoption.

RQ3: Establish the obstacles and barriers to adoption of HR Analytics in these subsidiaries?

To establish the key challenges that faced organisations in the population sample, descriptive statistics were used to group and rank the most common of these challenges and also identify some of the opportunities for improvement.

4. RESEARCH METHODOLOGY

This chapter discusses the methodology carried in conducting the research study as captured by the subheadings below.

4.1 Research Strategies and Design

A critical realist design was adopted to gain a broader and deep understanding of the phenomena associated with adoption of analytics within the Sub-Saharan Africa market context. Realism research philosophy argues that objects exist independently of our knowledge of their existence and like positivism deals with scientific inquiry. The basis of realism is that what our senses show us as reality is the truth hence objects have an existence independent of the human mind (Saunders & Lewis, 2012). Critical realism research is considered useful for scientific inquiry in organisational contexts that lend themselves to studies where they are concerned with first describing a complex business situation in order to understand what is going on. (Saunders & Lewis, 2012). The strength of critical realism lies in questioning what we experience and argues it is sensations or images of things in the real world, not the things directly. (Saunders & Lewis, 2012). The implication of this was that we needed to study not only what we directly observed but also what was beneath what we observed.

A quantitative research strategy was adopted for this study. Through a cross-sectional study, critical questions were posed to HR practitioner's to access their perception on the level of sophistication of HR as represented by their organisations ability to adopt innovative practices like HR analytics. The views were compared with the perception of front line managers of the same organisations in a form of triangulation using a comprehensive descriptive strategy of the dependent and independent variables applied via a questionnaire thereby giving more meaning to the initial exploratory work.

The research was conducted using a deductive approach in two stages. The first was a pre-test stage followed by a main data collection stage. In the main interview phase, a questionnaire with open and close-ended questions and quantitative approach was applied to test the constructs identified. The rationale for adopting this strategy was because the level of adoption of HR analytics and its related drivers or inhibitors can't always be predicted in advance, therefore, a quantitative approach supported by selected questioning was necessary to explore the research topic

further and extract more information that would throw light on the relationships between the variables identified on this discovery journey.

4.2   Pre-test Stage

The pre-test stage comprised 12 respondents who had a general management background. This stage was carried out to establish the ease of use of the questionnaire and also ensure the relevance of constructs.

In this stage, we also began the exploration of this topic using a quantitative section for the general management group plus a mixture of closed and open ended questions for a more HR oriented respondent. The decision to include open-ended questions was based on the premise that we needed to extract as much information from the respondents as possible without leading them on. This aligned well with the initial exploratory study recommendations (Zikmund, Babin, Carr, & Griffin, 2010). This is confirmed further, given that even though it is developing rapidly, HR analytics has until recently been regarded as a relatively new field. Hence an initial exploratory approach was considered useful for deeper discovery (Saunders & Lewis, 2012) before proceeding to an explanatory level.

4.2.1   Pre-Test Study Population

The stakeholders in the Pre-Test stage were selected based on the assumption that they were second year MBA students and were therefore expected to have a good general management background. The group was selected to include an HR practitioner who was presumed to have a good appreciation of the topic and research in question.

4.2.2   Pre-Test Sampling

Convenience sampling was applied in this instance based on the logic that this target group was easily accessible. The sampling, however, took on a purposive sampling approach to include HR practitioners based on the premise that the HR practitioners will have a deeper grasp of the topic at hand.

4.2.3   Pre-Test Unit of Analysis

The unit of analysis in this instance was the perception of 2015-2016 GIBS MBA students.

4.2.4   Pre-Test Survey Instrument

The questions in the data collection tool were derived from a comprehensive literature review which integrated work done by several scholars. Some of the key areas incorporated work on the HR intelligence value chain (Falletta, 2014), work from previous thesis (Dooren, 2012; Molefe, 2013) and work by other scholars (Menguc & Auh, 2010; Huang, Murat, & Roger, 2010). The instrument was amended further to include questions relating to key constructs such as institutional voids (Khanna et al., 2005) and the impact of national culture dimensions. Some of these are shown below.

Organizational culture

Scholars have highlighted the role of this dimension as a foundation to sustain competitiveness and some have referred to it as shared assumptions, values, and norms (Zheng, Yang, & Mclean, 2010). The elements of organisations culture said to enable organizational performance are; a mission, involvement, consistency, and adaptability. In the questionnaire, the variable was explained and a Five-Point Likert scale was applied ranging from 1 ("Strongly disagree") to 5 ("Strongly agree") (Brace, 2008).

Organization's structure

Literature defines organisational structure in two forms as either organic or mechanistic and goes further to measure it using three factors: decentralization of authority, the flatness of organizational structure, and employee multi-functionality (Huang et al., 2010). Decentralization of authority was assessed using a scale consisting of one Likert item (i.e. as shown in the questionnaire related to "...decision making"), flatness of organizational structure by using a scale consisting of two Likert items (i.e. As per questionnaire on "organisational hierarchy"), and employee multi-functionality was measured by a scale consisting of two Likert items (i.e. as per questionnaire on "employees performing a variety of tasks"). A total of five Likert items were applied to define the structure construct, which was expressed using a similar Likert scale as in the first construct.

Competitive intensity

Four Likert items were extracted to represent Competitive intensity in the environment from a study by (Menguc & Auh, 2010) (i.e. as per questionnaire related to "stiffness of competition in the industry"). There was no differentiation made

between competition in labour market and product/service market. Four items (i.e. as per the questionnaire "about competition in the industry as being stiff") were allocated using a similar Likert scale as with the first construct.

National culture

As explained before culture consists of shared assumptions, values, and norms (Zheng et al., 2010). National culture becomes more prominent in MNCs as they have complex internal environments to deal with exacerbated by spatial, cultural, and organizational distances; and also caused by cultural differences, language barriers and inter-unit power struggles as the subsidiaries attempt local adaptation of Head office practices resulting in possible inconsistencies and conflict of interests, values, practices, and routines used in the various parts of the organization (Dacin, Kostova, & Roth, 2008). In order to measure this dimension, the National culture was explained and then measured using a similar Likert scale as with the first construct.

Degree of application of HR analytics

The level of adoption of HR analytics was measured using a stepwise maturity framework defined using the following dimensions: HR analytics function, Organizational embeddedness, Statistical method applied and Data collection (Dooren, 2012).

To assess the maturity level in terms of the function of HR analytics, the respondents were asked to indicate which of the following roles HR Analytics fulfilled in the organisations. Options provided ranged from; Basic HR reporting (i.e. data from HCM or ERP systems), to HR value-added metrics (e.g. insight into performance ratings and recruitment), and Integrated talent management metrics (i.e. combined information such as percentage of higher performers retention) and finally to level of HR Business driver analytics (i.e. This was measuring the impact on business of HR measures e.g. employee turnover impact on financial performance). The responses were coded "1" (Yes) or "0" (No) or according to their existing level of adoption of HR analytics. Maturity was assessed by adding up the numbers of "Yes" selected. An increase in score implied more functions were fulfilled by HR analytics, and therefore the more mature an organization was in terms of HR analytics (Dooren, 2012).

The level of embeddedness of HR analytics in the business was measured in terms of the incidence of the presence of a team or function dedicated to HR analytics by selecting a response box, with the appropriate answer. The options ran from "On an ad-hoc basis", "Once in the period (i.e., weekly/ monthly/ quarterly/per year)", "Part-

time", and "Full-time", was coded with a score of 1 to 5 in that order. An increase in score would mean a higher level of embeddedness of HR analytics in the organisation which in turn meant a more advanced for the practice (Dooren, 2012).

To assess the level of sophistication in the applied statistical methodologies section, respondents were asked to specify which statistical methods were used in order to carry out HR analytics." A framework of four options was offered ranging from basic univariate statistics (i.e. means, mode etc.) to higher level multivariate statistics (i.e. structural equations, fixed effect models etc.). Responses were coded "1" (Yes) or "0" (No) again (Dooren, 2012).

The fourth question was based on work by (Mayo, 2006) and probed the kinds of data collected. Respondents were asked to specify the data that was gathered by their HR department. Four options were provided i.e. Workforce statistics (i.e. age, gender), Measures of people skills/values (i.e. skills, competencies), Financial ratios showing productivity and people key performance indicators (KPIs) e.g. Revenue/head etc.) and finally KPIs of efficiency and effectiveness of the HR function (i.e. efficiency and effectiveness of processes such as recruitments, appraisals etc.)" The responses were coded "1" (Yes) or "0" (No) again. The sum score for this question was computed and an increase in score indicated that the establishment was gathering more kinds of varied data and therefore becoming more advanced with respect to the HR practice in question.

To finally determine an organization's overall degree of maturity, all four dimensions were added together. A higher total score for an organization meant it was more mature in the adoption of HR analytics.

In summary, the overall survey method extracted quantitative data from the target respondents but it also included limited specific qualitative data for some of the respondents who happened to be in the HR field. For an HR Practitioner, the respondent was asked open-ended questions about what role HR analytics played in their organisations including how it supported the formulation of HR strategy and decision making in their business unit, where they see room for improvement and then also about what enablers and inhibitors of HR analytics existed in their context. The respondents were all asked to fill in a Biodata section and a quantitative section that gave feedback on the perceived level of adoption of HR Analytics in their organisations.

4.2.5   Pre-Test Data analysis

Feedback from the pre-test sample group was sought to establish the ease of use of the instrument and further analysis of content to establish the relevance of the key constructs and suitability of the instrument for the subsequent phases of this study. It was at this stage that some constructs were reworded to create clarity of meaning.

4.3   Main Study Survey

A survey monkey questionnaire was used to extract quantitative data from respondents as well as limited specified qualitative data from some of the respondents who happened to be in HR field. In this phase, the pre-tested questionnaire was amended and applied to the overall population sample. The rationale for amending was to allow for more anonymity by excluding fields like respondent's organisation and respondents title in the instrument. The quantitative descriptive design was applied using a five-point Likert-type scale questionnaire normalised with input from the pre-test. The instrument also included a qualitative section that was answered only by the HR practitioners for whom we made the assumption that they would have deeper insights on the state of HR analytics in their organisations.

4.3.1   Study Population

The population comprised of Line Managers/ Supervisors and HR practitioners of four large Multi-National Enterprise (MNE) and two other organisations operating in the Sub-Sahara Africa region with a combined headcount of over 20,000 employees in the region. MNEs selected came from different sectors and industries and represented sectors of Manufacturing, Oil, Mining, and Telecommunication and to a small extent Construction and Automotive industries. The reason for choosing these companies was because of their wide footprint representing a large part of the Sub-Saharan Africa region which in itself was also considered a proxy for Emerging Markets.

4.3.2   Sampling

Quota and purposive sampling were applied in this instance as we could not envisage enforcing a random sampling process on the various businesses due to the reason that many of the business units had a limited number of employees that could be targeted and could meaningfully respond to the subject matter of the research. However, we made the attempt to impose some characteristics on the procedure to ensure we have a good representation of the key stakeholder groups such as

including in the target sample; HR managers, line managers and other senior key HR practice users like supervisors and executives. The study enlisted 256 responses from employees in 24 organisations spread across Sub-Saharan Africa which was 42.5% of the initial sample population targeted.

4.3.3   Unit of Analysis

The unit of analysis applied comprised of the Line Leaders perceptions. The targeted group constituted mainly of corporate managers that were users of HR practice and through the survey we were able to get a handle on their view of the level of adoption and embeddedness of HR Analytics practice in an organisation.

4.3.4   Survey Instrument Amendment

The survey questionnaire tool used in the pre-test was amended further and applied. The changes applied were predominantly to make the respondent's information simplified and anonymous. A simplified comprehensive questionnaire was applied preceded with by a courteous consent note because it endeared respondents to share information in a non-threatening and friendly manner (Creswell, 2003:56). The Likert scale usually generates quantitative data but allows for flexibility so that the user can explore stimulating observations that arise (Brace, 2008). Some slight amendments were made to some questions to increase anonymity and confidentiality of the respondents and organisations. When formulating the questionnaire the researcher attempted to mitigate possible response bias and lack of completion by following some of the guidelines below:

- avoiding leading or loaded or double-barrelled questions
- avoiding making big assumptions
- ascertaining that the questions generate variance
- trying to be specific and avoid ambiguity
- avoiding very lengthy and complex or difficult questions

4.3.5   Data Gathering

Multiple data collection channels were deployed to provide triangulation of evidence. The survey questionnaire applied was divided into two sections; one meant for HR practitioners and the other meant for line managers or senior supervisors.

The bulk of the data collected was ordinal data and was derived from the survey instrument, which delved into practices of the MNE and its subsidiaries.

The process followed involved;

- Achieving consent approvals upfront from the MNE head offices

- Contacting the Head of HR or HR representative of the subsidiary to get local approval and engagement.
- Selection of the sample group in each country, requesting their distribution list from the local HR representative and confirmation that each of the respondents had been contacted to notify them of the impending survey questionnaire from the researcher.

4.4 Ethics

The process followed in collecting data was completed within the requirements of the University of Pretoria (GIBS) ethics guidelines. After obtaining approval from the head offices of the MNEs, further approval was sought at local country level.

4.5 Data Analysis

The procedure taken to code, analyse and report the results of data captured is shown in this section. After gathering the data it was exported into a Microsoft Excel worksheet where it was cleaned and incomplete responses excluded. The collected data was thereafter coded for analysis using IBM SPSS 22. In the data cleaning stage, where a single answer was found missing, this was replaced with the average of the employee's organisation's mean value. Where we found several questions unanswered the respondent would be eliminated altogether. Content analysis was done to establish which constructs are most useful in this study. It involved determining patterns, summarising and correlating the constructs identified in this stage to those from the literature review.

Table 1: Biodata Variable Coding

A1: Principal Sector/ Industry	Code		A2: Role level /Job Grade level	Code
Manufacturing	1		Unskilled	1
Mining	2		Semi-Skilled	2
Oil	3		Supervisor	3
Telecom	4		Manager	4
Other	5		Executive	5

A3: Tenure in Role	Code		A4: Tenure in Company	Code
< 1 Year (Yr)	1		< 1 Yr	1
1 to 3 Yrs	2		1 to 3 Yrs	2
More than 3 up to 5 Yrs	3		More than 3 up to 5 Yrs	3
More than 5 up to 10 Yrs	4		More than 5 up to 10 Yrs	4
above 10 Yrs	5		above 10 Yrs	5

A5: Organisation size	Code		A6: Education level	Code
1-10	1		Less than High School Certificate	1
11-50	2		High School Certificate	2
51-200	3		Diploma	3
201-501	4		Bachelor's Degree	4
501-1000	5		Post Graduate or Master Degree	5
1001-5000	6		Ph.D. or Doctorate	6
5001-10000	7			
10000+	8			

A7: Department	Code
Human Resources	1
Other	2

Table 2: Line Manager Response Variable Coding

A8: Question Responses	Code		A9: Analytics HC resources Qn	Code
Strongly Disagree	1		None	1
Disagree	2		On ad-hoc basis	2
Neutral/ neither	3		Once in period (e.g. week, month, qtr, Yr)	3
Agree	4		Part-time	4
Strongly Agree	5		Full-time	5

A10: Adoption of HRA Drivers	Code
YES	1
NO	0

Key: Year = "Yr"

4.5.1 Descriptive Statistics

Descriptive statistics were computed to access a high-level view of the data at hand. Some authors (Saunders & Lewis, 2012) describe Descriptive statistics as the quantitative description of data at hand and highlight that it is not inferential in nature. Its objective is to provide a researcher with a holistic overview of the profile of the data collected and also show to what level the sample make up reflects the population profile.

4.5.2 Reliability Analysis

For research to be reliable it must employ data collection methods and analysis procedures which produce consistent findings (Saunders & Lewis, 2012). For this purpose, Cronbach's Alpha statistics were computed at an overall level and also at an individual question level to understand the individual items influence on overall Cronbach's Alpha if an item were deleted.

Cronbach's alpha is a measure of internal consistency. It shows how closely related a set of items are as a group. It is considered to be a measure of scale reliability. A "high" value for alpha does not imply that the measure is unidimensional (Pallant, 2013)

4.5.3 Correlations

Correlation (r) is a measure used to establish the direction and strength of a linear relationship (Pallant, 2013). Other scholars highlight it as the strength of the relationship between two variables and the probability of the correlation taking place by chance (Saunders & Lewis, 2012)

In this study, Pearson correlation analysis was applied as it can establish whether a significant relationship exists between the independent variables. The value of the correlation coefficient shows the strength of the relationship, for instance, a correlation coefficient value of 0.8 and above shows a very strong relationship and a coefficient value of 0.5 indicates a moderate relationship whilst a value of 0.2 and below is representative of a very weak correlation (Saunders & Lewis, 2012). The p-value (probability value) in the correlation analysis represents the level of

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significance of the relationship between the variable tested. We assumed a 95% confidence level.

4.5.4   Regression Analysis

In this section, a Stepwise Forward Logistic Regression method was applied. It is a semi-automated process of building a model by successively adding variables based solely on the t-statistics of their estimated coefficients and the choice of predictive variables is carried out by an automatic procedure (Pallant, 2013). The subsequent regression coefficients are representative of the strength of the cause and effect relationship between the dependent variable and independent variable/s and it also highlights the probability of this occurring by chance (Saunders & Lewis, 2012). Hence through this method, we were able to determine a model showing the contingency factors that best predict the level of adoption of HR analytics and also to what extent the factors explain the model.

This choice of analysis was also influenced by the fact that this method is able to manage a dependent variable in binary format. As such the "YES" category was coded as "1" and the "NO" category was coded as "0".

4.5.5   T-Tests

In assessing hypotheses that the views of HR practitioners on the HR business driver analytics, integrated talent management, efficiencies, and HR measures differed from those of line managers we used an Independent Samples T-tests.

In the mechanics of these t-tests, the results were reported twice. The first line ("equal variances assumed") assumed that the aforementioned assumption of equal variances had been met. If this assumption didn't hold, the t-test results would need to be corrected. These corrected results would thereafter be presented in the second line ("equal variances not assumed"). The assumption of equal variances held was evaluated using Levene's test for the equality of variances. As a rule of thumb, if Sig. > .05, the first line of t-test results would be applied. Conversely, if its p-value ("Sig.") < .05 we would reject the null hypothesis of equal variances assumed and thus use the second line of t-test results (Pallant, 2013).

4.6   Research Limitations and Lessons

This study was conducted in fourteen Sub-Saharan Africa countries and therefore may not entirely be generalizable across all countries with any confidence. To mitigate this limitation a comprehensive literature review was conducted to cover the principles and constructs that are applicable in any country albeit to varying degrees.

The study was conducted using quota and purposive sampling which are both non-probability study approaches and as such the findings may not be generalizable to other populations with any confidence. This was mitigated by targeting the most senior managers in the organisations so that we could access a deeper understanding of the organisations strategies.

In the questionnaire, a Likert scale was applied. One shortcoming of Likert is that it does not generate qualitative data and yet some occurrences are better explained verbally than numerically. To mitigate this shortcoming selected input was introduced by way of open and close ended questions that were added to the questionnaire. This provided the ability to appropriately enrich some of the findings.

Responses were not easily forthcoming mainly attributable to the limited sample size of some of the MNE subsidiary offices and survey fatigue. This challenge was mitigated by additional respondent engagement, questionnaire simplification and also the consent letter revision to include a simplified description of the topic.

It was also found that due to the many variables (constructs) affecting the impact of the level of adoption of HR analytics, it would not be possible to get into extensive investigative depth on all constructs otherwise the questions would have been too many. This was mitigated by sense checking the literature for dimensions that needed deeper study and this resulted in a realignment of some questions for adequacy.

One last limitation was on one of the analysis methods applied i.e. Stepwise Logistic Regression method in that it is a useful method but if used improperly can converge on a poor model. Hence to mitigate this risk the variables that were added were sense-checked and reviewed in light of the literature review. Also, stepwise Logistic regression is known to fit better if applied within a sample rather where you introduce new data and as such, there was no new data introduced after the survey was closed.

5. RESULTS.

5.1 Introduction

In this chapter, the results are presented and discussed in line with chapter 3 (research questions) and in line with chapter 4 (research methodology). The source of the data for this research was a self-administered questionnaire filled by HR practitioners and line managers from the subsidiaries of MNEs in the following countries Botswana, Congo, Eritrea, Ethiopia, Ghana, Guinea, Malawi, Mozambique, Nigeria, Senegal, Tanzania, Uganda, Zambia, and Zimbabwe.

5.2 Descriptive Statistics

This section presents the demographic information of the responses that were received. The questionnaire was distributed to 624 respondents and subsequently, a total of 256 usable responses were obtained resulting in a 41% response rate which is considered acceptable at the time of survey closure. Of the respondents, 6 (2.3%) did not complete questions across different sections resulting in missing values and got excluded as a result.

Specific information included principal sector that the organisation belonged to, the level of the respondent's role, Tenure in role, Service tenure and the highest level of education completed by the respondent.

5.2.1 Sample characteristics

Table 3:   Principal Sector/ Industry.

Principal Sector/ Industry	Frequency	Percentage
Manufacturing	192	75.0%
Oil	22	8.6%
Mining	16	6.3%
Telecom	14	5.5%
Other	12	4.7%
Total	256	100.0%

The participating organisations belonged to the following sectors; Manufacturing, Mining, Oil, Telecommunications, Construction, and Automotive. The majority of responses came from manufacturing (75.0%). The rest came from Oil (8.6%), Mining (6.3%) and Telecom (5.5%) sectors that accounted for the next group of respondents

whilst a small contribution came from the construction and automotive sectors (4.7%).

Table 4:   Organisational Size.

Organisation size	Frequency	Percentage
5001-10000	123	50.4%
1001-5000	62	25.4%
51-200	30	12.3%
501-1000	17	7.0%
10000+	12	4.9%
Total	256	100.0%

The size of the organisations was broken down based on the number of employees as displayed above (Table 4)

Most of the respondents were serving within large organisations of 5001-10000 (50.4%) employees, and 10000+ employees (4.9%) but we had others serving in the small to medium sized organisations of 51-200 (12.3%), 501-1000 (7%) and 1001-5000 (25.4%).

Table 5:   Role Level.

Role level /Job Grade level	Frequency	Percentage
Manager	163	63.7%
Executive	47	18.4%
Supervisor	40	15.6%
Semi-Skilled	6	2.3%
Unskilled	0	0.0%
Total	256	100.0%

The role grade level distribution was broken down as shown in Table 5.
As shown the role level categories comprised mainly of a majority of senior employees. Executives comprised (18.4%), Managers (63.7%), Supervisors (15.6%) and Semi-skilled respondents (2.3%). There were no unskilled respondents is the population.

Table 6: **Length of Service in Current Role.**

Tenure in Role	Frequency	Percentage
1 to 3 Yr	90	35.2%
More than 5 up to 10 Yrs	56	21.9%
More than 3 up to 5 Yrs	52	20.3%
<than 1 Yr	37	14.5%
above 10 Yrs	21	8.2%
Total	256	100.0%

Key: Year = Yr

More than 85% of the respondents have served in their roles for more than 12 months and only 14.5% of the respondents have served for less than a year.

Table 7: **Highest Education Level.**

Education level	Frequency	Percentage
Bachelor's Degree	125	48.8%
Post Graduate or Master Degree	101	39.5%
Diploma	22	8.6%
High School Certificate	7	2.7%
Less than High School Certificate	1	0.4%
Doctoral/PHD degree	0	0.0%
Total	256	100.0%

More than 88% of the respondents have attained an educational level of a bachelor's degree and beyond.

5.3 Construct characteristics

Table 8: Characteristics of the constructs

	Std. Deviation	N
Competitive Intensity	0.63153	254
Availability of Institutions	0.73687	255
Organisational Structure and Resources	0.44392	255
Organisation HRA strategy	0.60918	255
Organisational Culture	0.71612	255
National Culture	0.73548	255
Alignment and Trust	0.88198	255

The standard deviation of the responses to these constructs shows a fairly tight dispersion in the responses as all of them were less than 1 standard deviation.

5.4   Level of Adoption Characteristics

The questionnaire was updated by 255 respondents in 24 Sub-Saharan based organisations. In reviewing the function of HR analytics and statistical methods applied the respondents indicate the following; The results (Table 9) show that 236 (92%) of the respondents apply some form of HR analytics at its very basic level of HR reporting, however, the number drops when rising HR analytics processing is required. For instance, only 164 (64.1%) go as far as using Integrated talent management and only 148 (57.8%) go further to adopt higher level HR analytics by applying HR business driver analytics.

In contrast, (Table 10) shows a larger majority of these respondents make use of basic univariate statistics in the form of means and percentiles (61.3%) although much less (23/24.2%) make use of Basic and advanced multivariate statistics as shown by the fewer respondents (see Table 10 at 24.2%), which makes it questionable if the 148 respondents (57.8%) in the establishments that have specified they apply HR business driver analytics really make use of this higher level of HR analytics

Table 9:   Function of HR analytics.

	Frequency	Percentage
Basic HR reporting	236	92.2%
HR value-added metrics	194	75.8%
Integrated talent management metrics	164	64.1%
HR Business driver analytics	148	57.8%

Table 10:   Statistical methods applied.

	Frequency	Percentage
Basic univariate statistics	157	61.3%
Advanced univariate statistics	89	34.8%
Basic multivariate statistics	59	23.0%
Advanced multivariate statistics	62	24.2%

5.4.1   Organisational embeddedness

In contrast to the above findings, views from 55 HR practitioners results show that the mean value of the level of adoption in the sample population (figure 9) was 5.3 but importantly only 7 (12.7%) respondents out the 55 indicated to be operating at a

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level of 7 and above on the "HR intelligence value chain" scale which runs from "0" (Human capital decision are largely based on gut feel, prior experience, and fads) to "10" (Human capital decisions are based on insightful HR analytics which is mainly predictive and supported by scientific evidence). At a level of 7, HR practice is on the cusp of what is considered "HR analytics" in terms of HR intelligence and level of sophistication (Falletta, 2014) and therefore the results from this group indicate 12.7% of the sampled group practice HR analytics. The mean score of this group shows that the organisations are still very much in the information phase of the value chain.

Figure 9: HR Intelligence Value Chain
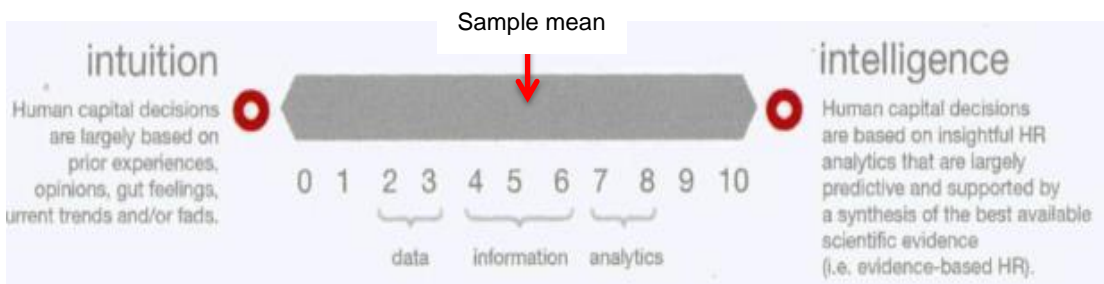
Source: (Falletta, 2014)

Table 11:   Organisational embeddedness resources

	Frequency	Percentage
Full-time	89	44.3%
On adhoc basis	39	19.4%
None	36	17.9%
Once in period (i.e. week/ month/, quarter/ year)	22	10.9%
Part-time	15	7.5%

In reviewing further at a level of Organisational embeddedness it is apparent that there a diverse spread of HR resources allocation ranging from not having a team or function dedicated to HR analytics (17.9%) to a significant number of respondents (44.3%) indicating having full-time resources focusing on HR analytics.

Table 12:   Statistical measures applied

	Frequency	Percentage
Workforce statistics	242	96.8%
Measures of people skills/values	231	92.4%
Measures of efficiency and effectiveness of the HR function	199	79.6%
Financial ratios relating to people and productivity	190	76.0%

From the Table 12, most data collected is on workforce statistics (96.8%) as the most commonly applied method followed by measures of people's skills/values (92.4%). Data collected on Measures of efficiency and financial ratios relating to people are at lower levels of 76.6% and 76% respectively.

5.5   Validity Analysis

In this section, the Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy and Barlett test for Sphericity were used to establish the appropriateness of proceeding with other statistical tests such as regression analysis on the data set. The Kaiser-Meyer-Olkin Measure (KMO) and Barlett's test results are displayed in table 13.
 The results show the final factor solution with a KMO measure of sampling adequacy of 0.768 which indicated that the data set and correlations are adequate for factor analysis. KMO Varies between 0 and 1. It measures the compactness of the partial correlations relative to the sum of the correlations. A lower value indicates diffusion in the pattern of correlations. A higher value 0.768 in our case indicates that patterns of correlations are relatively compact and so advanced analysis should yield distinct and reliable factors (Pallant, 2013) The data is, therefore, strong in terms of informative power and useful for further factor analysis.

Bartlett's measure tests the null hypothesis that the original correlation matrix is an identity matrix. If we are to consider that there is a need for some relationships between the variables and if the R matrix were an identity matrix then all correlations would be zero (Pallant, 2013). A significance value of less than 0.05 as shown in the table would indicate there are some relationships between the variables. Given the p-value = 0.000 (<0.05) this means that there is scope for reducing the dimensions in the data set.   From the above results, both tests meet the criteria and therefore further analysis was allowed to proceed.

Table 13   Kaiser-Meyer-Olkin Measure and Bartlett's test

Test		Measure
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.768
Bartlett's Test of Sphericity	Approx. Chi-Square	1185.505
	Df	153
	Sig.	.000

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5.6 Reliability Analysis

5.6.1 Overview

According to (Saunders & Lewis, 2012) Pearson correlation analysis is useful for its ability to establish whether a significant relationship exists between the independent variables. The value of the correlation coefficient indicates the strength of the relationship, for instance, a correlation coefficient value of 0.8 and above indicates a very strong relationship and a coefficient value of approximately 0.5 indicates a moderate relationship whilst a value of 0.2 and below is representative of a very weak correlation

The p-value (probability value) in the correlation analysis represents the level of significance of the relationship between the variable tested. We assumed a 95% confidence level, therefore, correlation is significant at the 0.05 level (2-tailed). A p value of less than 0.05 would lead to rejection of a null hypothesis and a conclusion that the relationship is significant. Where a p-value is less than 0.01 this would imply a highly significant relationship (Pallant, 2013).

As mentioned in Chapter 4 the Reliability analysis adopted was Cronbach's Alpha statistics. Cronbach's alpha as a measure of internal consistency measures how closely related a set of items are as a group and is also considered to be a measure of scale reliability. A "high" value for alpha does not imply that the measure is unidimensional. From the Summary Reliability statistics table, 5.6.1 below the Cronbach's alpha determined for the key items was 0.662 suggesting that the items have a relatively high internal consistency. (Note that a reliability coefficient of .65 or higher is usually considered "acceptable") (Pallant, 2013).

Table 14   Reliability Statistics

Cronbach's Alpha	N of Items
.662	19

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5.6.2 Descriptive Item Statistics

The table (15) below gives the average responses for the scale questions. The mean columns show the responses to each of the scale questions which were asked and this was above 3 for most of the questions on a scale of 1 to 5.

Table 15:   Item Statistics.

	Mean	Std. Deviation	N
Competition in our industry is cut throat.	3.96	.919	250
Anything that one competitor can offer, others match easily	3.54	.944	250
Price competition is the hall mark of our industry	4.00	.834	250
One hears of a new competitive move almost every day	3.40	1.018	250
Institutional voids (gaps) affect the implementation of HR analytics in our business	3.56	.935	250
The capacity of our National IT infrastructure hinders adoption of HR analytics in our business	3.08	.964	250
Skills shortfall in our market hinders adoption of HR analytics in our business	3.08	1.028	250
The organisation provides employees with training to perform multiple tasks	3.99	.781	250
There are few levels in our organisational hierarchy	3.23	.979	250
Mundane/small issues usually get referred to someone higher up for a final answer	2.84	1.043	250
Before a decision is executed hardly any action can be taken until a supervisor approves a decision	3.07	.990	250
Employees in this business learn how to perform a variety of tasks and can fill in for others if needed	3.91	.768	250
My organisation is innovative in the way that products and services are delivered	4.27	.680	250
My organisation has a wide variety of products/ services which appeal to a diverse customer group	4.34	.707	250
My organisation has got a deliberate HR analytics strategy in place	3.36	.973	250
HR analytics supports your organisations performance	3.75	.804	250
Our organisations performance culture supports adoption of HR analytics	3.72	.722	250
On the subject of HR analytics, there is alignment and trust between HR and all other departments	3.59	.884	250
Our national norms, beliefs or culture support adoption of new innovations such as HR analytics)	3.60	.734	250

The standard deviation column shows how dispersed these responses were from the mean and in general, they were close to 1 standard deviation which meant the data points gathered closer to the mean in this case i.e. responses were relatively converging. The overall mean is also above 3.5 implying a tendency to agree with

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questions with the exception of mundane/small issues getting referred upwards for a final answer

The table 16 below gives an itemised view of Pearson correlation relationships between the 19 question items.

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Table 16 : Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Competition in our industry is cut throat.	64.33	35.966	.295	.644
Anything that one competitor can offer, others match easily	64.75	38.213	.083	.669
Price competition is the hall mark of our industry	64.29	36.818	.253	.649
One hears of a new competitive move almost every day	64.89	34.924	.342	.637
Institutional voids (gaps) affect the implementation of HR analytics in our business	64.73	36.576	.232	.651
The capacity of our National IT infrastructure hinders adoption of HR analytics in our business	65.20	36.597	.218	.653
Skills shortfall in our market hinders adoption of HR analytics in our business	65.20	35.906	.252	.649
The organisation provides employees with training to perform multiple tasks	64.30	36.024	.366	.637
There are few levels in our organisational hierarchy	65.06	38.559	.045	.675
Mundane/small issues usually get referred to someone higher up for a final answer	65.44	39.878	-.068	.691
Before a decision is executed hardly any action can be taken until a supervisor approves a decision	65.22	36.871	.185	.658
Employees in this business learn how to perform a variety of tasks and can fill in for others if needed	64.38	36.084	.368	.637
My organisation is innovative in the way that products and services are delivered	64.02	37.401	.265	.649
My organisation has a wide variety of products/ services which appeal to a diverse customer group	63.94	36.832	.319	.643
My organisation has got a deliberate HR analytics strategy in place	64.93	34.661	.390	.631
HR analytics supports your organisations performance	64.54	35.157	.447	.628
Our organisations performance culture supports adoption of HR analytics	64.56	36.006	.408	.635
On the subject of HR analytics, there is alignment and trust between HR and all other departments	64.70	35.865	.323	.641
Please indicate which option applies in terms of your national culture (Our national norms, beliefs or culture support adoption of new innovations such as HR analytics)	64.69	37.788	.193	.655

The final column on the right gives us the movement in Cronbach's alpha if a specific item is removed. This reflects the impact of a question asked in contrast to the others shown. For instance, if the first question is removed, and the Cronbach's alpha goes down to 0.644, this means the question was not aligned with the rest of the questions as compared to the second question which if removed increases the Cronbach's alpha statistic. The questions with Cronbach alpha highlighted in <mark>yellow</mark> were found to increase the overall Cronbach alpha if removed which means they are aligned with the rest if the questions. These questions are:

- Anything that one competitor can offer, others match easily (– Which belongs to competitive intensity construct)
- There are few levels in our organisational hierarchy - Which belongs to organisational structure construct)
- Mundane/small issues usually get referred to someone higher up for a final answer - Which belongs to organisational structure construct)

The above results suggested the variables relating to the above questions needed further analysis to understand how well they correlate with each individual item.

5.6.3 Inferential statistics for items

Further Pearson correlation analysis was conducted on all 19 items and showed that the following items displayed the strongest correlations as shown in Table 17

Table 17: Strongest Individual Item Pearson Correlations Identified.

	8	12	15	16	17	18	20	21	22	23	24	25	29
8 The organisation provides employees with training to perform multiple tasks	1												
9 Our organisational hierarchy has few levels	-.063												
10 Small or mundane issues typically get referred to someone higher up for a final answer	-.232**												
11 Decision execution hardly occurs unless a supervisor approves the decision	.001												
12 Employees in this busines learn how to multi-task and can fill in for others if needed	.544**	1											
13 Organisation innovativeness in the way that products and services are delivered	.265**	.228**											
14 Organisation has a wide range of products/ services with appeal to	.317**	.275**											
15 Organisation has got a deliberate HR analytics strategy in place	.408**	.385**	1										
16 HR analytics supports your organisations performance	.489**	.408**	.590**	1									
17 Our organisations performance culture supports adoption of HR analytics	.449**	.454**	.528**	.740**	1								
18 On the subject of HR analytics there is alignment and trust between HR and all other departments	.388**	.401**	.514**	.645**	.585**	1							
19 Basic HR reporting (data from ERP or HR systems such as Headcount reports, Labour Turnover and Employee satisfaction surveys)	.151*	.171**	.193**	.269**	.245**	.231**							
20 HR value-added metrics (e.g. insight into performance ratings and recruitment process effectiveness	.246**	.306**	.397**	.458**	.319**	.524**	1						
21 Integrated talent management metrics (e,g, combined information such as percentage of higher performers retention	.205**	.207**	.291**	.415**	.227**	.365**	.459**	1					
22 HR Business driver analytics (e.g. business impact of HR measures i.e. employee turnover impact on financial performance	.261**	.207**	.377**	.399**	.315**	.349**	.471**	.512**	1				
23 Basic univariate statistics (mean, median, mode, percentiles, standard deviation etc)	.220**	.205**	.350**	.418**	.439**	.413**	.404**	.342**	.274**	1			
24 Advanced univariate statistics (correlation, skewness, differences in means, differences in variables etc)	.086	.090	.203**	.201**	.224**	.250**	.342**	.325**	.418**	.503**	1		
25 Basic multivariate statistics (ANOVA, factor analysis, regression, logit/probit, survival/hazard analysis etc)	.093	.050	.195**	.100	.128*	.173**	.256**	.283**	.331**	.370**	.614**	1	
26 Advanced mulitivariate statistics (Structural equations, fixed-effects models, maximum likelihood models etc used for testing direct and indirect effects of variable on one another.	.103	.040	.201**	.154*	.176**	.194**	.289**	.239**	.369**	.385**	.642**	.595**	
29 Financial ratios relating to people and productivity (e.g. Sales/head or revenue costs)	.157*	.151*	.183**	.275**	.195**	.245**	.287**	.155*	.264**	.286**	.163*	.115	1
30 Measures of efficiency and effectiveness of the HR function (e.g. cost ratios, rates of partcipation, efficiency and effectiveness of appraisal, recruitment, succession planning and training	.219**	.247**	.249**	.379**	.240**	.331**	.442**	.306**	.346**	.312**	.235**	.168**	.583**

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

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

Interpretation Key for the Correlation strength:	Moderate	0.35 -		Strong			0.6 - 0.8					

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Table 17 shows correlations at the 5% level of significance and some of the notable items display either strong or moderate correlation. These include;

- Employees training to perform multiple tasks with Employees performing a variety of tasks to fill in for others if needed ($r = 0.544$, $p < 0.01$)
- The organisation having a deliberate HR analytics strategy in place with
  - HR analytics supporting organisations performance ($r = 0.590$, $p < 0.01$)
  - Organisations performance culture supporting adoption of HR analytics ($r = 0.528$, $p < 0.01$)
  - Alignment and trust between on HR analytics between HR and other departments ($r = 0.514$, $p < 0.01$)
- HR analytics supporting organisations performance with
  - Organisations performance culture supporting adoption of HR analytics *($r = 0.740$, $p < 0.01$)*
  - Alignment and trust on HR analytics between HR and other departments ($r = 0.528$, $p < 0.01$)
- Performance culture supporting adoption of HR analytics with
  - Alignment and trust on HR analytics between HR and other departments ($r = 0.585$, $p < 0.01$)
- Alignment and trust on HR analytics between HR and other departments with
  - HR value-added metrics ($r = 0.524$, $p < 0.01$)
- Integrated talent management metrics with
  - HR Business driver analytics ($r = 0.512$, $p < 0.01$)
- Basic univariate statistics with Advanced univariate statistics ($r = 0.503$, $p < 0.01$)
- High-level univariate statistics with
  - Basic multivariate statistics ($r = 0.614$, $p < 0.01$)
  - High level multivariate statistics ($r = 0.642$, $p < 0.01$)
- Basic multivariate statistics with
  - High level multivariate statistics ($r = 0.595$, $p < 0.01$)
- Financial ratios relating to people and productivity (e.g. Sales/head or revenue costs) with
  - Measures of Efficiency and effectiveness of HR ($r = 0.583$, $p < 0.01$)

These items play a critical role in the level of influence of adoption of HR analytics as they correlate well with each other and therefore warrant further investigation.

On the other hand some of the weak or negative correlations are as shown in Appendix 9.4 (Table) and they include;

- Competition in our industry is very stiff with;
  - Referral of Mundane/small issues higher for answers ($r = -.005$, $p < 0.01$)
  - Decision making authority ($r = 0.106$, $p < 0.01$)
  - Employees performing a variety of tasks to fill in for others if needed ($r = 0.078$, $p < 0.01$)
  - Organisations innovativeness via products and services delivery ($r = 0.040$, $p < 0.01$)
  - Organisations wide variety of products/ services appeal to diverse customer groups ($r = -.004$, $p < 0.01$)
  - Organisation having a deliberate HR analytics strategy in place($r = 0.016$, $p < 0.01$)
  - HR analytics supporting organisations performance ($r = 0.082$, $p < 0.01$)
  - Organisations performance culture supporting adoption of HR analytics ($r = 0.065$, $p < 0.01$)
  - Alignment and trust on HR analytics between HR and all other departments ($r = -.035$, $p < 0.01$)
  - Basic HR reporting i.e. data from HR systems such as Headcount reports, Labour Turnover and Employee engagement surveys) ($r = 0.057$, $p < 0.01$)
  - HR value-added metrics ($r = 0.063$, $p < 0.01$)
- These items will not feature in the model of the items that can influence level of adoption of HR analytics

5.6.4 **Pearson correlation indicators for dimensions identified (N=255).**

Table 18 Pearson correlation of dimensions

Constructs	M	SD	1	2	3	4	5	6	7
1. Competitive Intensity	3.72	0.63	1						
2. Availability of Institutions	3.24	0.74	.218**	1					
3. Organisational Structure and Resources	3.40	0.44	.211**	.256**	1				
4. Organisation HRA strategy	3.98	0.61	0.008	0.008	.193**	1			
5. Organisational Culture	3.72	0.72	0.049	-0.054	0.118	.579**	1		
6. National Culture	3.60	0.74	0.023	-0.048	-0.024	.260**	.344**	1	
7. Alignment and Trust	3.59	0.88	-0.064	-0.115	0.107	.476**	.659**	.388**	1

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

Reliability coefficient alphas
Interpretation Key for the Correlation strength: Moderate 0.35 - 0.6   Strong 0.6 - 0.8

The table 18 shows that individual items have been aggregated into key dimensions and some of the dimensions 4 to 7 show moderate to strong positive correlations (Saunders & Lewis, 2012).

Organisational Culture exhibited a strong positive correlation with Alignment and Trust (r = 0.659, $p < 0.01$). Organisations strategy exhibited a fairly strong positive correlation with organisational culture (r = 0.579, $p < 0.01$). Alignment and Trust exhibited a moderately positive correlation with Organisations strategy (r = 0.476, $p < 0.01$) as well as Alignment and Trust with National culture (r = 0.388, $p < 0.01$).

It is also notable that correlations between the other dimensions (competitive intensity, availability institutions, organisational structure, and resources) resulted in weak correlation relationships. However, all seven dimensions below play an influencing role in some form as they showed correlation at varied levels.

- Competitive Intensity
- Availability of Institutions
- Organisational Structure and Resources
- Organisation HR analytics strategy
- Organisational Culture
- National Culture
- Alignment and Trust

5.6.5 T-Tests

In checking the consistency of our earlier findings even further (for reliability) Independent Samples T-tests were conducted on two groups of respondents (195 Line Managers and 55 HR Practitioners). Their perceptions with regard to the level of adoption of HR Business driver analytics and level of adoption of integrated talent management metrics within their organisations was tested relative to each other

Table 19   Group Statistics

Which department do you belong to?		N	Mean	Std. Deviation	Std. Error Mean
HR Business driver analytics (e.g. business impact of HR measures i.e. employee turnover impact on financial performance	Human Resources	55	.58	.498	.067
	Other	195	.59	.492	.035

Table 20   Independent Samples Test: HR Business Driver

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
HR Business driver analytics	Equal variances assumed	.110	.740	-.173	248	.863	-.013	.075	-.161	.135
	Equal variances not assumed			-.172	86.061	.864	-.013	.076	-.164	.138

As shown in table 20, the t-test results were reported twice. The first line ("equal variances assumed") assumed that the aforementioned assumption of equal variances has been met. If this assumption didn't hold, the t-test results would need to be corrected. These corrected results would thereafter be presented in the second line ("equal variances not assumed"). Whether the assumption of equal variances held was evaluated using Levene's test for the equality of variances. As a rule of thumb, if Sig. > .05, the first line of t-test results would apply. Or conversely, if the p-

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value ("Sig.") < .05 we would reject the null hypothesis of equal variances and thus use the second line of t-test results. The results showed a Sig value of 0.740 implying that the HR practitioner's perceptions with regard to HR Business driver analytics impact did not differ from the views of line managers so we rejected the Null hypothesis that HR practitioner perceptions differ from the line managers.

Table 21   Independent Samples Test: Integrated Talent management metrics

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Integrated talent management metrics	Equal variances assumed	.374	.542	.295	248	.769	.021	.073	-.122	.165
	Equal variances not assumed			.296	87.456	.768	.021	.072	-.123	.165

As shown in table 21, the t-test results were managed as before. The results showed a Sig value of 0.542 implying that the HR practitioner's perceptions with regard to integrated talent management metrics analytics did not differ from the views of line managers so again we rejected the Null hypothesis that HR practitioner perceptions differ from the line managers.

5.7   Logistic Regression Analysis

In this section, we were able to establish the influencing dimensions for the adoption of HR analytics and the level to which they explain their influence. The strength of cause and effect relationships between a dependent variable (HR Business driver analytics which represented HR analytics adoption) and independent variables was investigated. For this purpose, we used the stepwise forward selection logistic regression analysis (Pallant, 2013)

Table 22   Classification Table [a,b]

Observed			Predicted		
			HR Business driver analytics		Percentage Correct
			No	Yes	
Step 0	HR Business driver analytics	No	0	102	0.0
		Yes	0	147	100.0
	Overall Percentage				59.0

a. The constant is included in the model.

b. The cut value is .500

From the table 22, we note that 0 cases were observed as "NO" and predicted as "NO", 0 were observed as Yes and predicted as No, 102 cases were observed as No and were predicted as No and 147 were observed as Yes and were predicted as Yes. The classification table classifies the 59% of the cases correctly.

Table 23   Factors in the Equation Step 0

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.365	.129	8.043	1	.005	1.441

Step 0 gives the model without the independent variables. The tables from the step 1 will give more information with regards to the independent variables that predict/have an impact on HR Driver Analytics.

Table 24   Factors in the Equation Step 1 - 3

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Organisational Culture	1.306	.239	29.981	1	.000	3.692
	Constant	-4.484	.901	24.782	1	.000	.011
Step 2[b]	Organisation HRA strategy	.886	.299	8.799	1	.003	2.426
	Organisational Culture	.918	.267	11.821	1	.001	2.503
	Constant	-6.544	1.173	31.104	1	.000	.001
Step 3[c]	Organisation HRA strategy	.881	.302	8.498	1	.004	2.413
	Organisational Culture	.828	.274	9.140	1	.003	2.288
	National Culture	.438	.217	4.077	1	.043	1.549
	Constant	-7.763	1.380	31.642	1	.000	.000

a. Factor(s) entered on step 1: Organisational Culture.

b. Factor(s) entered on step 2: Organisation HRA Strategy

c. Factor(s) entered on step 3: National Culture.

The Wald measure is comparable to the LR test however here it is used to check the hypothesis that each beta< 0. In the sig column, the p-values are all below 0.05 meaning that those are the variables which are the best at predicting HR Drivers analytics.

Finally, the 'Variables in the Equation' table summarise the importance of the explanatory variables at an individual level. Organisation strategy (on HR analytics and Innovativeness), Organisational culture and National culture were the best predictors of HR Driver Analytics.

Table 25   Model if Term is removed

Variable		Model Log Likelihood	Change in -2 Log Likelihood	df	Sig. of the Change
Step 1	Organisational Culture	-168.505	40.097	1	.000
Step 2	Organisation HRA Strategy	-148.457	9.436	1	.002
	Organisational Culture	-150.398	13.318	1	.000
Step 3	Organisation HRA Strategy	-146.180	9.054	1	.003
	Organisational Culture	-146.645	9.984	1	.002
	National Culture	-143.739	4.171	1	.041

To test the strength of the model we review its performance through the level of change of significance value on addition of constructs

Table 26   Factors not in the Equation

			Score	df	Sig.
Step 1	Variables	Competitive Intensity	.186	1	.666
		Availability of Institutions	.462	1	.497
		Org Structure Resources	.191	1	.662
		Organisation HRA strategy	9.335	1	.002
		National Culture	4.610	1	.032
		Alignment Trust	4.587	1	.032
	Overall Statistics		16.681	6	.011
Step 2	Variables	Competitive Intensity	.226	1	.635
		Availability of Institutions	.265	1	.607
		Org Structure Resources	.859	1	.354
		National Culture	4.178	1	.041
		Alignment Trust	2.687	1	.101
	Overall Statistics		7.894	5	.162
Step 3	Variables	Competitive Intensity	.275	1	.600
		Availability of Institutions	.259	1	.611
		Org Structure Resources	.581	1	.446
		Alignment Trust	1.441	1	.230
	Overall Statistics		3.633	4	.458

The table 26 above shows the different variables that were not included in the model at each and every step. These are the variables which do not predict HR Drivers Analytics according to the sig values.

Table 27   Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	40.097	1	.000
	Block	40.097	1	.000
	Model	40.097	1	.000
Step 2	Step	9.436	1	.002
	Block	49.533	2	.000
	Model	49.533	2	.000
Step 3	Step	4.171	1	.041
	Block	53.704	3	.000
	Model	53.704	3	.000

The omnibus tests of the model coefficients table gave the result of the Likelihood Ratio (LR) test which indicates whether the inclusion of this block of variables contributes significantly to model fit with a p-value (sig) of less than 0.05.

This table includes the Chi-Square goodness of fit test. It has the null hypothesis that intercept and all coefficients are zero and we can reject this null hypothesis for each block which means that the block 1 model is a significant improvement to the block 0 model.

Table 28   Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	1.472	3	.689
2	17.528	7	.014
3	17.387	7	.015

The Hosmer-Lemeshow tests the null hypothesis that predictions completed by the model fit perfectly with observed group memberships.

Table 29   Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	296.913[a]	.149	.201
2	287.477[b]	.180	.243
3	283.306[b]	.194	.262

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

b. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

From the table above it can be deduced that between 19% and 26 of the variation in survival can be explained by the model in step3.

5.8   HR Analytics Adoption Barriers

In reviewing the HR section of the questionnaire and views obtained from 55 HR respondents, the following results show the categories of items that were apparent on the barriers that impact the adoption and level of adoption of Hr analytics.

Table 30:   Barriers to adoption of HR analytics

Item	Responses	Percentage
HRA skills/competence	16	24%
Inability to motivate Business case	10	15%
Not affording a decent HRIS system	10	15%
Data Quality	7	11%
Lack of discipline & accountability	6	9%
Inadequate Leadership support	6	9%
Lack of clear HRA Strategy	4	6%
Lack of Trust (system & personal)	2	3%
Business level of maturity	2	3%
Inadequate Structure	2	3%
Lack of line involvement	1	2%

When captured by incidence the above table indicates the top barriers listed as shown but also broadly fall into three buckets;

- Leadership support/ resources allocation/systems trust (42%)
- HR analytical skills/competence (24%)
- Poor Data Quality and the lack of a deliberate HRA strategy (17%)

The areas that fall under leader seem to feature the most and it goes to show that with good leadership support a lot can be achieved in overcoming HR analytics adoption challenges.

In the final analysis when the HR practitioners were asked if they were happy with the level of impact of HR analytics in their organisation approx. 50% of the respondents indicated they were satisfied, 12.75% were neutral and 37.5% were not satisfied.

5.9   Summary of Results

In summary, out of the seven dimensions identified through the literature review as having an influence on the level of adoption of HR analytics, only three showed as moderate to strong predictors of the level of adoption of HR analytics. These three were; Organisational Culture, HR analytics strategy, and National culture. Given the level of prediction was explained /determined it followed therefore that a model or equation could be arrived at.

Further, the results also showed that while we are not able to establish strong correlation relationships between all the independent variables influencing HRA adoption, there were some that displayed strong and moderate relationships.
Notable of the independent variable correlation relationships were;

- Organisational Culture with Alignment and Trust
- Organisations HRA strategy with organisational culture
- Alignment and Trust with Organisations strategy and
- Alignment and Trust with National culture.

And by reviewing the notable correlations it was found that one independent variable stood out as being moderately and strongly correlated in relation to the above three independent variables. The independent variable of "Alignment and Trust" featured the strongest positive correlations with the above three. This also meant that the research could benefit from further investigation of the Trust and alignment construct.

Lastly, of interest is that the line managers views were tested for alignment in perception with HR practitioners within the same organisations on two key measures of the level of adoption of HR analytics. The findings revealed that contrary to previous expectations where it was assumed that HR practitioners and line manager views would differ, the two groups were aligned in terms of their views about the level of adoption of the HR business driver analytics and integrated talent management analytics in their organisations.

6. DISCUSSION OF RESULTS

The overall research objective was to measure the contingency factors impacting the adoption of HR analytics and also look at which factors have the most influence on the level of adoption of HR analytics. In the context of human capital management, HR analytics is a rapidly developing decree for organisations aspiring to outperform their peers (Falletta, 2014).

This chapter provides a discussion and analysis of the organisational influences on the level of level of adoption and level of sophistication of HR analytics in this study. The following steps will be followed in this chapter. A discussion of descriptive statistics, followed by a review of each research question with its related analysis in the form of correlations, forward logistic regression analysis or other as per the question or hypothesis tested, and a conclusion of the outcome.

6.1 Descriptive Statistics

From the results (Table 9 and Table 10) show that, 236 (92%) of the respondents showed that they were applying HR analytics at its very basic level of HR reporting, however, the number drops to 148 (57.8%) who indicated to go further and adopt HR analytics at a higher level by applying HR business driver analytics.

In contrast, a larger majority of these respondents made use of basic univariate statistics such as medians/percentiles/means (61.3%) and much less (23/24.2%) made use of Basic and advanced multivariate statistics respectively as shown by the fewer respondents (see Table 10 at 24.2%), which makes it questionable if the 148 respondents (57.8%) in the organizations who have specified that they apply HR business driver analytics at this high level really make use of it at that level.

For further analysis of results, the constructs were analysed as below and result validated further through a couple of methods which included comparing the views between two groups i.e. 55 HR practitioners and 195 line managers of respondents.

6.2 RQ 1: Establish the contingency factors impacting the adoption of HR analytics in MNE subsidiaries

This question seeks to establish various factors influencing the degree of adoption of HR analytics in the subsidiaries in the context of the sampled organisations. The analysis applied was captured in chapter 4.

Two Pearson's correlation procedures were run to establish the relationships. First at an individual item (component level) and then at a construct (dimension) level. In the first procedure, the individual items (questions) were tested to see their individual impact on the dependent variable of HR analytics business driver. In the second procedure, the aggregated contingency factors were also tested to the establish the relationships between them for the ones that showed positive correlation relationships.

6.2.1 Identified contingency factors

The results in chapter 5 (table 18) highlighted seven contingency factors as below that showed interconnectedness with respect to the level of adoption of HR analytics. These factors can be found in both internal and external environments of the organsiations and are all supported by earlier literature in chapter 2;

- Competitive Intensity
- Availability of Institutions
- Organisational Structure and Resources
- Organisation HR analytics strategy
- Organisational Culture
- National Culture
- Alignment and Trust

All seven factors had a standard deviation of less than 1 meaning the responses were not dispersed in general and were to the contrary convergent. There were five factors whose mean was above 3.5 meaning there was a tendency to agree to the questions asked. As mentioned in chapter 5 also the results showed that four factors were correlating well i.e.; Organisational Culture with Alignment and Trust, Organisations strategy with organisational culture, Alignment and Trust with Organisations strategy and lastly Alignment and Trust with National culture

6.2.2 Interpretation of Results

Understanding the interconnectedness of the factors (shown by the correlations) allows the organisations to better interact with their environments (Anitha & Aruna, 2014). By deliberately applying these factors in HRIS, an organisation is able to influence the level of HR analytics functionality at a pace which will in turn positively influence the performance of the organisation (Chugh, 2014).

There are a few negative correlations particularly relating to the availability of institution which implies that is not an area for focus this context.

6.3 RQ 2: Establish the factors that are the strongest predictors of HR analytics adoption in this context?

Over and above the analysis conducted in question one this question seeks to identify which of the dimensions are the strongest contributors and predictors of effective HR analytics. A stepwise forward Logistic Regression was used to analyse and isolate the most powerful predictors of HR analytics adoption.

6.3.1 Organisational Culture (OC)

Results from the logistic regression in table 24 and table 25 show that organisational culture was a strong predictor of the degree of adoption of HR analytics in the population and can explain the level of adoption outcome at a level of 27.4% (S.E. = 0.274) in the model. The interconnectedness of this independent variable with other independent variables can influences the level of adoption outcomes through a network effect.

We would like to discuss OC relationship with trust as highlighted through the Pearson's correlation. Table 18 indicated that there was a strong positive relationship between organisational culture and organisational trust ($r = 0.659$, $p < 0.01$). These constructs in the study are key in ensuring that organisations can extract value and are able to compete. Literatures shows us that dominant cultures do affect performance (Prenestini & Care, 2013). Effective HRM practices such as HR analytics have been shown to affect the positive formation and existence of impersonal trust in the organisations which in turn facilitates continuous innovation and enables organisations to remain competitive (Vanhala & Ritala, 2016).

The findings here support the literature as they show that a strong correlation (r = 0.659, p < 0.01) exists between trust and culture. This implies that leadership can build trust to positively influence the culture of an organisation which will in turn impact performance positively.

6.3.2 HR analytics strategy (HRAS)

Results from the logistic regression in table 24 also show that a deliberate organisational strategy was a strong predictor of the degree of adoption of HR analytics in the population that can explain the level of adoption outcome at a level of 30.2% (S.E. = 0.302) in the model. The interconnectedness of this independent variable with other independent variables also influences the level of adoption outcome through a network effect.

The existence and internalisation of a solid HR analytics organisational strategy have been described by many scholars as being critical to the success of HR analytics (Angrave et al., 2016; Am & Abel, 2012). Even further the authors argue Analytics is a mandatory capability for HR practitioners, a mechanism for creating value for organisations from its employees and a roadmap to extending the impact of the HR departments. It is important to note that Table 5 highlights that 82% of the sample respondents were of the level of managers and above which meant that in general terms the respondents had a good understanding of their organisations strategy and this gives reasonable confidence in the output of the study as views representative of their business goals and assessment of HR analytics.

The findings here support literature in that there is a healthy correlation in this instance between organisations HR analytics strategy and culture (r = 0.579, p < 0.01). This association is quite useful as it shows that a leadership can through their strategy influence culture and eventual performance and sustainability of an organisation.

6.3.3 National culture (NC)
Results from the logistic regression in table 24 also show that National culture was a moderate predictor of the degree of adoption of HR analytics in the population that can explain the level of adoption outcome at a level of 21.7% (S.E. = 0.217) in the model. The interconnectedness of this independent variable with other independent variables also influences the level of adoption through a network effect.

As mentioned before in the results (table 18) "There is a healthy correlation between Alignment and Trust with National culture ($r = 0.388$, $p < 0.01$).

As earlier discussed without alignment and trust it can be argued that no strategy will able to see the light of day.(Vanhala & Ritala, 2016)

6.3.4 Trust (T)

To better understand how the above-mentioned predictors come together to make the model work you have to consider the interceding role of trust between HR practice and organisation performance. As shown in Chapter 2 figure 6, (Tremblay et al., 2010) remind us how the complex psychological state of employees operates in line with the social exchange theory. The scholars were able to show that even with both soft approaches to HR practice and hard approaches to HR practice the real relational exchange mechanism that will lead to organsitional effectiveness (superior performance) is through using procedural justice and the perception of organsizational support that will lead to trust which then results in employee commitment.

6.4 RQ 3: Establish the obstacles and barriers to adoption of HR Analytics in subsidiaries.

In attempting to establish the key challenges that subsidiaries organisations are faced with to apply this technology, descriptive statistics were used to group and rank the most common of these challenges and also identify some of the opportunities for improvement.

In reviewing the HR section of the questionnaire and the top views obtained from 55 HR respondents, the showed following results

The top barriers are broadly captured in four buckets;
- HR analytical skills/competence
- Leadership support/ resources allocation/systems trust
- Data Quality
- Lack of an HR analytics strategy

The interconnectedness of these barriers is apparent in some cases for example a barrier linked to resource allocations like inability to afford an HRIS system is caused by lack of a suitable business case motivation which is resolved through leadership

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support as leadership in some of the sampled organisations showed they would be willing to invest in HR analytics if they can see a Return On Investment motivation.

6.5   Concluding remarks

In the discussion above and observations of patterns in the data there are strong indications that contingency factors that will most influence HR driver analytics in the sampled population of MNEs will comprise the following independent variables; Organisational Culture, Organisations HRA strategy, and National culture. The three are positively correlated with the mediating variable of trust.

It cannot be emphasised enough how important the role of building trust is to enable the model to operate that we are predicting especially after seeing the way that trust is highly correlated with all three of the predictor variables and further if we one takes cognisance of how some scholars have identified the mediating role of trust between HR practice and organisational effectiveness (Tremblay et al., 2010)

To achieve improved HR analytics adoption in an organisation therefore, the researcher proposes a restated model below with the above mentioned independent predictor variables of HR analytics adoption playing the most influential role.

Figure 10: Restated HR analytics adoption improvement model

RQ2   Org Culture

RQ2   HR analytics strategy

RQ2   National Culture

Level of HR analytics adoption

Trust and Alignment

RQ1, RQ2
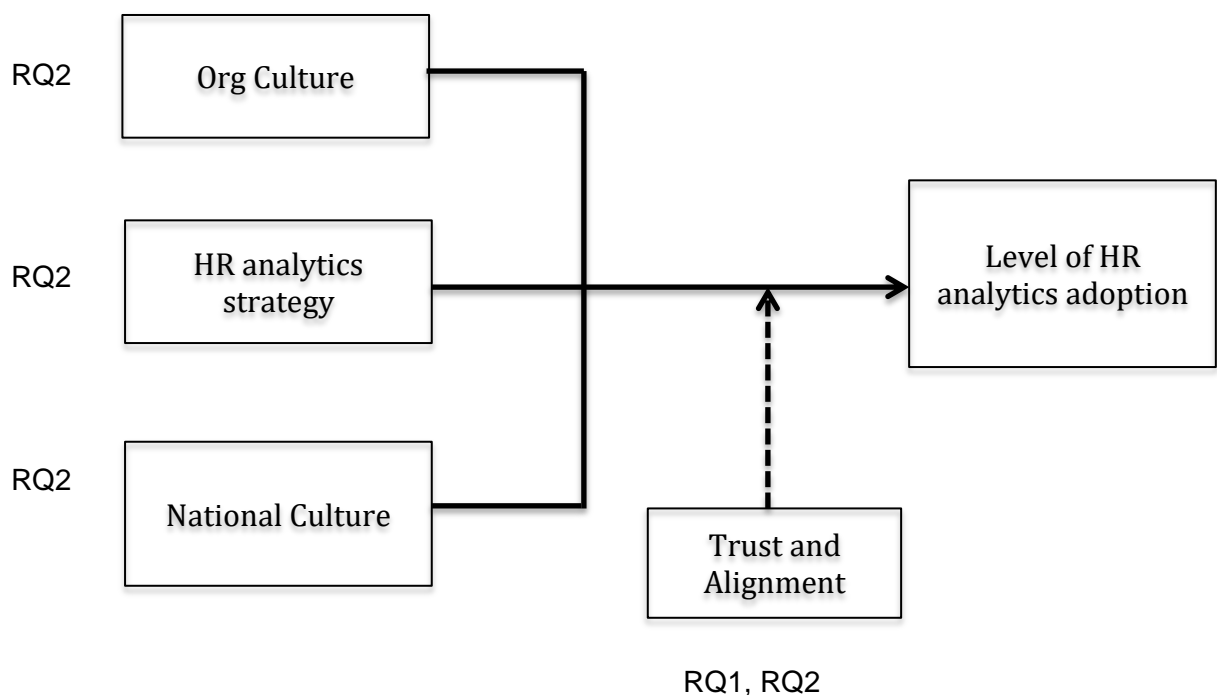
In summary, the results of the analysis were discussed and linked to literature. The model that had earlier been proposed was revised using the data provided and convincing predictors of HR analytics were presented in a model equation represented by the diagram above i.e. (variables in the equation as per table 24 and table 25); Organisational Culture, Organisations HRA strategy, and National culture).

This is not to say that the other constructs that were not shown in the equation are not important. On the contrary, they need to exist but will not be as influential in creating improvements in the adoption of HR analytics in this context of the research study. In addition to this, the Pearson correlations finding that 'alignment and Trust' has moderate to strong correlations between the above three mentioned independent variables (Organisational culture, HRA strategy and National culture) means is it cannot be ignored. The literature argues trust plays a mediating role in technology adoption and hence must be included. Further investigation of the influence of the mediating role is for future research.

7. RESEARCH CONCLUSION AND RECOMMENDATIONS

The aim of this study was to establish the variables that are the major predictors of adoption of HR analytics. The focus of the study was to provide Hr practitioners and line managers with tools with which they can better use HR Information Systems and HR data. The study was motivated by the perception that this evolving technology is not being utilised by organisations sufficiently either by way of not accessing the technology or acquiring the technology but not leveraging it and hence missing an opportunity to become more competitive.

Literature was reviewed and it resulted in the crafting of 3 research questions tailored around building a model based on a review of 7 key contingency factors.
In an effort to ensure reliability and validity of the result, hypotheses were developed and tested. A model was built using a forward Logistic Regression applied to the responses from the 256 employees of the subsidiaries.

In chapter 7 the main findings and managerial implications are summarised. Further to this, limitations of the study were laid out as well as recommendations for future research.

7.1   Summary of findings

In line with the analysis of demographics, our population sample showed that there a good spread of respondents across categories for organisational size, tenure in role, tenure in company, grade level in organisation. The majority of the respondents came from the manufacturing sector.

The overall goals of the study were achieved with findings that organisational culture, national culture, and organisational HR analytics strategy are the three strongest predictors of the level of adoption of HR analytics in MNE subsidiaries. These findings are important for corporate managers seeking to leverage HR analytics to enhance their organisations competitiveness and performance.

This study also suggests, if we look at chapter 2 in terms of the other dimenions that need to be considered for adoption to happen, we shall need to get the basics right first. We can not build a house with a foundation. There are building blocks that a

needed to a foot in the door of HR analytics- These include the skills bases which include change management for both HR and line managers as (B. D. Ulrich et al., 2015) suggest is needed to build the capability. We must also get clean data issue resolved as a foundation and ofcourse then the performance culture starts to kick in and the organisation will be well on its way to make a difference. I would consider the basics as the order qualifers and the predictor variables as the order winners.

7.2   Research Contribution

There are a couple of contributions to theory and practice that this study sheds light on including some unresolved issues.

It is pleasing to note that this study links into several studies carried out (Farndale & HopeHailey, 2010; Tremblay et al., 2010) linking into complex psychological topics. The social exchange theory is one such phenomenon that talks about how a "black box" works and explains how HR practice links to organisational commitment and high performance. Having researched the adoption of HR analytics it becomes clearer how the above theory can be leveraged using the strongest predictors of adoption to achieve phenomenal results. The model developed in this study takes the trust construct which is at the centre of the black box and uses this to fast track adoption!

Secondly, the evidence in the study showed a healthy connection between the organisation strategy and HR business driver analytics suggesting that academics can through analytics play a key role in creating an understanding of the contexts of organizations that can result in higher level of learning on what makes organisations effective.

Third, this study has also resulted in some additional interesting insights about integrating a stakeholder theory into a resource-based view. It shows us that even though resources may be provided in a hierarchical manner in an organisation, a stakeholder in an organisation has a significant opportunity to impact the organizational effectiveness through influencing its culture irrespective of the availability of resources. Research is suggested to investigate this proposition further.

By finding that organizational culture and national culture were both exerting significant influence on HR analytics adoption at a level over and beyond many other constructs led us to the belief that well-managed cultural transitions will impact HR analytics significantly and given the premise that this will lead to better insights and decision making only goes to show that theoretically this can be translated into value to sustain an organization.

7.3   Managerial Contribution

In the search for competitive advantage to ensure better performance, companies will increasingly adopt technologies like HR analytics which will stretch HR practitioners and front line managers. The imperative for organisations to start to invest ahead of the curve is going to be the most important contribution of this study. The importance of developing a deliberate analytics strategy ahead of the competitors, building a culture that is aligned to Hr analytics and managing the national culture as indicated by the most influential variables will be the key that will give organisations most leverage for competitive advantage. The findings suggest to such organisations to embrace HR analytics practice much quicker and aim for high levels of innovation that is typical of prospectors and analysers as this will lead to continuous improvement and more focused execution of new ideas and practices.

The national culture finding suggests to multinationals teams at regional head offices to be sensitive in their interactions with the local subsidiaries as they introduce new ideas, practices, and products with respective to the local cultures. This sensitivity could come in the form of cultural training for expats before they relocate to the local host countries.

Alignment and trust were observed as key mediating factors between the two most significant stakeholders (line managers and Hr practitioners) that can influence the employee's performance and business at large. Literature suggests the key to achieving such alignment and trust is through effective communication (Norton & Coffey, 2007). It is imperative that the two groups align so that organisational performance can be maximised.

Some authors show how employee trust in the entire organisation is linked to opinions about the operational HRM practices and the authors further reveal such practices can be leveraged to build the impersonal element of organisational trust (Vanhala & Ahteela, 2011). This has very practical ramifications because it allows management to start to build systems trust by investing in the impersonal trust sub-domain which can be done easily by using the HR analytics platform and thereby start to influence the overall trust dimension which as has been shown is a key underpinning pillar to our model or other organisational performance models.

Many organizations view HR analytics as IT software programs operating HR information and are still missing the opportunities. HR analytics is much more than just the manipulation of data if it is to achieve the full potential of the value that it is deemed to offer. To do this it has to be embraced fully and integrated fully into a culture of the organisation. The organisations must focus on ensuring an HRA strategy is implemented and that HR analytics practices are embedded and part of the day to day functioning across the entire the organisation and not just be left to the HR department. The initiative must receive the needed tools and support so as to impact the company bottom line.

This study, therefore, shows that while there are many factors affecting adoption, if we invest in the most influential areas we will see faster adoption and better results. The adjacent interrelationships between national culture, organisational culture, and organisational strategy make this possible underpinned by trust. Scholars (Zheng et al., 2010) have highlighted that the organisations that can deliver on their values, keep employees engaged, are flexible, can adapt and have tailored missions tied to their cultures will be better poised to probe into issues, manage costs better, be more visionary and act more proactively. This, in a nutshell, is a recipe for success.

7.4   Limitations and recommendations for future research

There are a couple of limitations identified;

The research was conducted in Multinational Enterprise subsidiaries located in Sub-Saharan Africa and most were skewed to the manufacturing sector which means the findings may also not be completely generalizable or transferable across all sectors in all countries as there may be circumstances that are unique. A global study on this subject could be valuable in identifying more findings.

Other areas of further study are the relationships of the different levels of HR analytics with sub-constructs such as impersonal trust and interpersonal trust and linked to its effect on organisational performance. Even though this study identified a relationship between trust and the level of adoption of HR analytics, it did not go far enough to identify the individual levels of influence of various types of trust (i.e. impersonal trust and interpersonal trust) on adoption of HR analytics.

HR analytics has a foundation pillar in the knowledge management sphere and therefore the interplay between stakeholder theory and the resource-based view can be taken a step further by assessing its relationship with the knowledge-based view of the organisations. This interplay can also look at the power dimensions for future study.

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9. LIST OF APPENDICES

9.1 RESEARCH CONSENT FORM

From: Kenneth Wanyoto

To:

Re: Enablers and Inhibitors of HR analytics in Sub-Saharan Africa organisations

Dear Colleague/HR practitioner,

I am an MBA student conducting research with regard to the adoption of Human Resource data, metrics, and analytics in organisations.
HR analytics helps organisations demonstrate a causal relationship between the activities exacted within HR practice and business outcomes.
Many factors within or outside organisations especially in emerging markets impact their ability to adopt HR analytics to improve HR practice.

Your input will help us understand this and the extent of use of HR analytics in Sub-Saharan Africa organisations. Your participation is voluntary and you can withdraw without penalty at any time. Of course, all data will be kept confidential. If you have any concerns, please contact me or my supervisor. Our details are provided below.

Researcher	Kenneth Wanyoto	+27713130480	kenneth.wanyoto@impactfactor.co.za
Research Supervisor	Professor Albert Wocke	+27 117714000	wockea@gibs.co.za

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9.2 QUESTIONNAIRE

Adoption of HR Analytics in Emerging markets: Study in Sub saharan Africa

A: Bio data Section

All respondents to fill

1. What is the name of your organisation? Optional

* 2. What is your industry?

○ Manufacturing

○ Mining

○ Oil

○ Financial Services

○ Other (please specify)

* 3. In what country do you work?

* 4. What category does your Job Grade fall?

○ Unskilled (usually manual jobs)

○ Semi-skilled

○ Supervisor (e.g. team leaders)

○ Manager

○ Executive

* 5. How long have you served in your current role?

○ Less than One year

○ 1 to 3 years

○ More than 3 up to 5 years

○ More than 5 up to 10 years

○ Above 10 years

* 6. How long have you worked at the company?

○ Less than 12 months

○ 12 months - 3 years

○ > 3- 5 years

○ > 5 - 10 years

○ > 10 years

* 7. What is the highest level of education completed?

- ○ Less than high school certificate
- ○ High school certificate
- ○ Diploma
- ○ Bachelors degree
- ○ Post Graduate or Masters degree
- ○ Doctoral/ PHD degree

* 8. Which department do you belong to?

- ○ Human Resources
- ○ Other

B: HR Practitioner Section

Only HR practitioners to update this section.

* 9. Please briefly describe your current role (function and tasks)

* 10. Do you engage in HR analytics in your role? Which HR processes are involved?

* 11. How long have you worked with HR analytics?

- ○ Not at all
- ○ Less than 12 months
- ○ 1 - 3 years
- ○ 3 - 5 years
- ○ 5 - 10 years
- ○ over 10 years

12. In your view, how would you briefly describe HR analytics? Please feel free to advise "not sure" if it applies.

* 13. Roughly how many full-time employees currently work for your organization?

- ○ 1-10
- ○ 11-50
- ○ 51-200
- ○ 201-500
- ○ 501-1,000
- ○ 1,001-5,000
- ○ 5,001-10,000
- ○ 10,000+
- ○ I am currently not employed

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* 14. What is the estimated ratio of labour to total operational costs (%) in your organisation? E.g. if you spend 10M on labour and 50M on operational costs then the ratio is 20%.

[   ]

* 15. Does your organisation apply HR analytics? If Not why not?

[   ]

* 16. What drove your organisation to start applying HR analytics?

○ Internal efficiency business goal

○ increasing intensity of competition

○ need to improve employee engagement

○ Other (please specify)

[   ]

17. How is your organisation fulfilling the objectives of HR analytics?

What data is collected?	[ ]
Which metrics are reported?	[ ]
What statistical/ analysis methodologies are used? (means, percentiles etc)	[ ]
What analytical software/ tool is/are applied?	[ ]
How are they applied? through which HR processes?	[ ]

* 18. Who is involved in the execution of HR analytics in your organisation? is there a team or department dedicated to HR analytics?

[   ]

* 19. Who is interested in the results?

[   ]

* 20. There is trust and alignment between HR and the following departments on HR analytics?

○ Finance and not any other

○ Information Technology and not any other

○ Both Finance and IT but not any other

○ All departments except Finance and IT

○ All departments

○ None of the departments

○ Other (please specify)

[   ]

* 21. Are you satisfied with the impact of HR analytics in your organisation

◯ Not applicable (if you don't collect or use any HR/ employee data)

◯ Strongly disagree

◯ Disagree

◯ Neither

◯ Agree

◯ Strongly Agree

* 22. How would you assess the level of your organisations maturity with regards to the HR analytics maturity model below?
At "0" - Human capital decisions are based on prior experiences, opinions, gut feelings, fads.
At "10" - Human capital decisions and based on insightful HR analytics that are largely predictive and supported by a synthesis of the best available scientific evidence (evidence based HR)
As a guide
("2-3": data is collected and reported), ("4 - 6": Information is derived - Proactive responses to HR activities starting to happen), ("7 - 8": Analytics is applied. insights drawn, proactive and predictive response to Hr activities)

```
0          HR Intelligence value Chain          10   [   ]
○─────────────────────────────────────────────────
```

23. What are you able to achieve by adopting HR analytics in your organisation?

* 24. What are the key enablers of HR analytics in your organisation?

* 25. What can be improved with respect to the adoption of HR analytics within your organization? OR What future plans do you have?

* 26. In your view what are the key barriers and obstacles in adoption of HR analytics in our business?

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* 27. Which institutional voids are a hindrance to adoption of Hr analytics in your business if at all? name them please

i.e.Lack of intermediaries such as reputable HRIS Suppliers

i.e. Regulatory frameworks

Other Institutional voids - please specify ;

Indicate if None of the challenges above apply

* 28. Is there a relationship between financial health of your business and application of HR analytics? If Yes, briefly explain which.
(This can either be due to HR analytics increasing organisation performance OR due to the larger possibilities in healthy financial organisations to start up an HR analytical approach)

* 29. Lastly, what 2 - 3 lessons in your view can we learn from attempting to adopt HR analytics in Sub Saharan Africa?

C: Key HR User Section (Line Manager or other)

* 30. Please indicate the extent with which you agree with the following statements about the Competitive intensity in your industry.

	Strongly disagree	Disagree	Neither	Agree	Strongly Agree
Competition in our industry is cut throat.	○	○	○	○	○
Anything that one competitor can offer, others match easily	○	○	○	○	○
Price competition is the hall mark of our industry	○	○	○	○	○
One hears of a new competitive move almost every day	○	○	○	○	○

* 31. Please indicate the extent with which you agree with the following statements on availability of institutions (i.e. specialized intermediaries, suppliers, regulatory reform, contract enforcement), infrastructure and skills

	Strongly disagree	Disagree	Neither	Agree	Strongly Agree
Institutional voids (gaps) affect the implementation of HR analytics in our business	○	○	○	○	○
The capacity of our National IT infrastructure hinders adoption of HR analytics in our business	○	○	○	○	○
Skills shortfall in our market hinders adoption of HR analytics in our business	○	○	○	○	○

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* 32. Please indicate the extent with which you agree with the following statements on your organisations structure and resources.

	Strongly Disagree	Disagree	Neither/ Neutral	Agree	Strongly Agree
The organisation provides employees with training to perform multiple tasks	○	○	○	○	○
There are few levels in our organisational hierarchy	○	○	○	○	○
Mundane/small issues usually get referred to someone higher up for a final answer	○	○	○	○	○
Before a decision is executed hardly any action can be taken until a supervisor approves a decision	○	○	○	○	○
Employees in this busines learn how to perform a variety of tasks and can fill in for others if needed	○	○	○	○	○

33. Please indicate the option that applies

	None	On adhoc basis	Once in a period (e.g. Weekly, monthly, quarter, annually)	Part-time	Full-time
In my organisation there is a team or function that is dedicated to HR analytics	☐	☐	☐	☐	☐

* 34. Please indicate the extent to which you agree with the following statements about your organisation

	Strongly Disagree	Disagree	Neither/ Neutral	Agree	Strongly Agree
My organisation is innovative in the way that products and services are delivered	○	○	○	○	○
My organisation has a wide variety of products/ services which appeal to a diverse customer group	○	○	○	○	○
My organisation has got a deliberate HR analytics strategy in place	○	○	○	○	○

* 35. Please indicate the option that applies in terms of your organisational culture

	Strongly Disagree	Disagree	Neither/ Neutral	Agree	Strongly Agree
HR analytics supports your organisations performance	○	○	○	○	○
Our organisations performance culture supports adoption of HR analytics	○	○	○	○	○

* 36. Please indicate which option applies in terms of your national culture

	Strongly Disagree	Disagree	Neither/ neutral	Agree	Strongly Agree
Our national norms, beliefs or culture support adoption of new innovations such as HR analytics	○	○	○	○	○

* 37. Please indicate the extent with which you agree with the following statement.

	Strongly Disagree	Disagree	Neither/ Neutral	Agree	Strongly Agree
On the subject of HR analytics there is alignment and trust between HR and all other departments	○	○	○	○	○

* 38. Please indicate which of the following roles HR Analytics fulfills in your organisation;

	YES	NO
Basic HR reporting (e.g data from ERP or HCM systems such as Headcount reports, Labour Turnover and Employee satisfaction surveys)	○	○
HR value-added metrics (e.g. insight into performance ratings and recruitment process effectiveness	○	○
Integrated talent management metrics (e,g, combined information such as percentage of higher performers retention	○	○
HR Business driver analytics (e.g. business impact of HR measures i.e. employee turnover impact on financial performance	○	○

Comment if needed

[   ]

* 39. Please indicate if any of these statistical methodologies are applied in order to carry out your HR analytics processes

	YES	NO
Basic univariate statistics (mean, median, mode, percentiles, standard deviation etc)	○	○
Advanced univariate statistics (correlation, skewness, differences in means, differences in variables etc)	○	○
Basic multivariate statistics (ANOVA, factor analysis, regression, logit/probit, survival/hazard analysis etc)	○	○
Advanced mulitivariate statistics (Structural equations, fixed-effects models, maximum likelihood models etc used for testing direct and indirect effects of variable on one another.	○	○

Comment if needed

[   ]

*40. Please indicate which data sets are collected by the HR Department in your organisation

	YES	NO
Workforce statistics (e.g. gender, age, absenteeism, job type, ethnic origin etc)	○	○
Measures of people skills/values (e.g. Index of key qualities such as experience, knowledge and skills, competencies and attitudes, values, potential, performance, employee engagement)	○	○
Financial ratios relating to people and productivity (e.g. Sales/head or revenue costs)	○	○
Measures of efficiency and effectiveness of the HR function (e.g. cost ratios, rates of partcipation, efficiency and effectiveness of processes such as appraisal, recruitment, succession planning and training	○	○

Comment if necessary

Thank you for your participation!

Source: Adapted from (Dooren, 2012; Menguc & Auh, 2010; Huang et al., 2010; Khanna et al., 2005)

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9.3 TIMELINE

RESEARCH PROJECT TIMELINE		
ACTIVITY	**PERIOD**	**DATE**
Research Project		
1st Meeting Supervisor	1 day	Thursday, April 7, 2016
Proposal workshop	1 day	Monday, April 11, 2016
Complete Chapter 1	7 days	11 - 18 April 2016
Design assessment tool	1 day	Thursday, April 14, 2016
Design script	1 day	Wednesday, April 13, 2016
Complete Chapter 2	7 days	18 - 24 April 2016
Email MTN, SABMiller, Standard Bank and Imperial	1 day	Tuesday, April 19, 2016
Submit DOC	1 day	Friday, April 15, 2016
Complete Chapter 3 & 4	3 days	22 - 26 April 2016
London CASS business Trip	7 days	24 April - 1st May 2016
Integrate Proposal	4 days	9 - 11 May 2016
Proposal Draft to Supervisor	1 day (AM)	Thursday, May 12, 2016
Gather more info in holding period	2 days	12 - 13 May 2016
Rework Proposal	2 days	14 - 16 May 2016
Submit Proposal	1 day	Monday, May 16, 2016
Prep for Ethics clearance	2 days	May- July 2016
Submit Ethics Clearance	1 day	Monday, August 1, 2016
Ethics Clearance Opening	1 day	Monday, August 1, 2016
Prep for 1st Elective PMC	2 days	24 - 25 May 2016
1st Elective	4 days	26 - 29 May 2016
Rest days	1 day	Monday, May 30, 2016
Prep for 2nd Elective MNE	2 days	31 May - 1 June 2016
2nd Elective	4 days	2 - 5 June 2016
2nd Meeting Supervisor	1 day	Tuesday, June 7, 2016
Data collection	13 days	6 - 29 June 2016
Data collection: Intervention	13 days	6 - 29 June 2016
1st General Research Workshop	1 day	Monday, June 27, 2016
Prep for 3rd Elective SLDM	2 days	28 -29 June 2016
3rd Elective	4 days	30 June - 3 July 2016
Data collection: Intervention	13 days	4 - 27 July 2016
1st Quant Workshop	1 day	Thursday, July 28, 2016
Prep for 4th Elective SE	2 days	23-24 Aug 2016
4th Elective	4 days	25-28 Aug 2017
Rest days	2 days	3 - 4 August 2016
Analyse data	5 days	5 - 9 August 2016
Complete Chapter 4	5 days	10 - 15 August 2016
2nd Quant Workshop	1 day	Monday, August 15, 2016
1st Qual Workshop	1 day	Wednesday, August 17, 2016
2nd General Workshop	1 day	Monday, August 22, 2016
Submit draft Thesis	1 day	Thursday, September 1, 2016
Prep for Final Elective	2 days	30-31 August 2016
Final Elective	4 days	1 - 4 September 2016
Submit draft Thesis	1 day	Thursday, September 1, 2016
Supervisor to review	14 days	2 - 15 September 2016
3rd Quant Workshop	1 day	Monday, September 19, 2016
2nd Qualitative Workshop	1 day	Wednesday, September 21, 2016
Complete Chapter 5, 6 & 7	30 days	16 September - 1 October 2016
3rd Meeting Supervisor	1 day	Monday, October 10, 2016
3rd General Research Workshop	1 day	Monday, September 26, 2016
Submit to Supervisor	1 day	Sunday, October 2, 2016
Supervisor review	10 days	Wednesday, October 12, 2016
4th General Research Workshop	1 day	Monday, October 31, 2016
Prepare the document for submission		Sunday, November 6, 2016
Submission of Thesis	1 day	Monday, November 7, 2016

9.4 CONSISTENCY MATRIX

TITLE: A DIAGNOSTIC MODEL FOR ADOPTION OF HUMAN RESOURCES ANALYTICS IN LOCAL SUBSIDIARIES: STUDY FOCUSED ON SUB-SAHARAN AFRICA..

PROPOSITIONS/QUESTIONS/HYPOTHESIS	LITERATURE REVIEW	DATA COLLECTION TOOL	ANALYSIS
1. What are the contingency factors impacting the adoption of HR analytics in MNE subsidiaries?	(Khanna et al., 2005) (Dooren, 2012) (Mondore et al., 2011)	Questions 13, 14, 20, 30, 31, 32, 33, 34 - 40	Content analysis Pearsons Correlation T-tests Frequency analysis on fixed sum scale to determine categories and rank them
2. What are the strongest predictors of HR analytics effectiveness displayed?	(Stone et al., 2015) (Falletta, 2014) (Dooren, 2012) (Tremblay et al., 2010)	Questions 20, 32,33, 34 - 40	Content analysis Pearsons Correlation Forward stepwise Logistic regression
3. What are the obstacles and barriers to adoption of HR Analytics in these subsidiaries?	(Falletta, 2014) (Dooren, 2012) (Angrave et al., 2016)	Question 26	Content analysis Frequency analysis on categories and rank them

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9.5   ETHICS APPROVAL LETTER

Dear Mr Kenneth Wanyoto

Protocol Number: **Temp2016-01679**

Title: **A diagnostic model for adoption of Human Resources analytics in emerging markets**

Please be advised that your application for Ethical Clearance has been APPROVED.

You are therefore allowed to continue collecting your data.

We wish you everything of the best for the rest of the project.

Kind Regards,

Adele Bekker

Table 31: PEARSON CORRELATION TABLE

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	#
1	Competition in our industry is cut throat.	Pearson Correlation	1																													
2	Anything that one competitor can offer, others match easily	Pearson Correlation	.338**	1																												
3	Price competition is the hall mark of our industry	Pearson Correlation	.305**	.202**	1																											
4	One hears of a new competitive move almost everyday	Pearson Correlation	.399**	.218**	.278**	1																										
5	Institutional voids (gaps) affect the implementation of HR analytics in our business	Pearson Correlation	.143*	.106	.093	.196**	1																									
6	The capacity of our National IT infrastructure hinders adoption of HR analytics in our	Pearson Correlation	.026	.132*	.016	.123	.392**	1																								
7	Skills shortfall in our market hinders adoption of HR analytics in our business	Pearson Correlation	.134*	.082	.138*	.215**	.322**	.364**	1																							
8	The organisation provides employees with training to perform multiple tasks	Pearson Correlation	.152*	-.045	.077	.038	-.107	-.051	-.092	1																						
9	There are few levels in our organisational hierarchy	Pearson Correlation	.123	.056	-.009	.129*	.098	.149*	.078	-.063	1																					
10	Mundane/small issues usually get referred to someone higher up for a final answer	Pearson Correlation	-.005	.068	.005	.080	.268**	.200**	.091	-.232**	.134*	1																				
11	Before a decision is executed hardly any action can be taken until a supervisor approves a	Pearson Correlation	.106	.035	.178**	.082	.159*	.204**	.210**	.001	-.016	.439**	1																			
12	Employees in this busines learn how to perform a variety of tasks and can fill in for others if	Pearson Correlation	.078	-.064	.125*	.160*	-.015	-.001	.020	.544**	-.018	-.307**	-.132*	1																		
13	My organisation is innovative in the way that products and services are delivered	Pearson Correlation	.040	-.163**	.069	.043	-.008	-.041	.022	.265**	.008	-.234**	-.034	.228**	1																	
14	My organisation has a wide variety of products/ services which appeal to a diverse customer	Pearson Correlation	-.004	-.119	.139*	.028	.059	.037	.081	.317**	-.084	-.077	.070	.275**	.483**	1																
15	My organisation has got a deliberate HR analytics strategy in place	Pearson Correlation	.016	-.102	.028	.060	-.057	-.027	.013	.408**	-.043	-.177**	.009	.385**	.316**	.326**	1															
16	HR analytics supports your organisations performance	Pearson Correlation	.082	-.086	.067	.102	-.051	-.096	.053	.489**	-.171**	-.215**	-.020	.408**	.272**	.274**	.590**	1														
17	Our organisations performance culture supports adoption of HR analytics	Pearson Correlation	.065	-.119	.080	.109	-.049	-.063	-.030	.449**	-.122	-.324**	-.078	.454**	.345**	.363**	.528**	.740**	1													
18	On the subject of HR analytics there is alignment and trust between HR and all other	Pearson Correlation	-.035	-.142*	-.005	.025	-.134*	-.066	-.064	.388**	-.097	-.266**	-.004	.401**	.299**	.223**	.514**	.645**	.585**	1												
19	Basic HR reporting (e.g data from ERP or HCM systems such as Headcount reports, Labour	Pearson Correlation	.057	.002	-.026	.082	.004	-.069	.101	.151*	-.094	-.123	-.023	.171**	.193**	.070	.193**	.269**	.245**	.231**	1											
20	HR value-added metrics (e.g. insight into performance ratings and recruitment process	Pearson Correlation	-.063	-.143*	-.057	.021	-.116	-.171**	-.128*	.246**	-.186**	-.144*	-.080	.306**	.116	.152*	.397**	.458**	.319**	.524**	.349**	1										
21	Integrated talent management metrics (e,g, combined information such as percentage of higher performers retention	Pearson Correlation	.138*	.048	-.086	.125*	-.062	-.106	.078	.205**	-.077	-.225**	.018	.207**	.166**	.007	.291**	.415**	.227**	.365**	.243**	.459**	1									
22	HR Business driver analytics (e.g. business impact of HR measures i.e. employee turnover impact on financial performance	Pearson Correlation	.020	-.053	.019	.107	-.027	.008	.046	.261**	-.144*	-.215**	.056	.207**	.272**	.161*	.377**	.399**	.315**	.349**	.167**	.471**	.512**	1								
23	Basic univariate statistics (mean, median, mode, percentiles, standard deviation etc)	Pearson Correlation	-.011	-.114	-.008	.096	-.027	-.089	-.056	.220**	-.103	-.138*	-.019	.205**	.293**	.242**	.350**	.418**	.439**	.413**	.258**	.404**	.342**	.274**	1							
24	Advanced univariate statistics (correlation, skewness, differences in means, differences in	Pearson Correlation	-.134*	-.136*	-.023	-.049	-.005	-.114	-.054	.086	-.174**	-.104	.043	.090	.157*	-.041	.203**	.201**	.224**	.250**	.118	.342**	.325**	.418**	.503**	1					
25	Basic multivariate statistics (ANOVA, factor analysis, regression, logit/probit, survival/hazard	Pearson Correlation	.106	-.027	.055	.067	-.048	-.010	-.002	.093	-.059	-.045	.116	.050	.123	.023	.195**	.100	.128*	.173**	.102	.256**	.283**	.331**	.370**	.614**	1			
26	Advanced mulitivariate statistics (Structural equations, fixed-effects models, maximum	Pearson Correlation	.044	-.038	.009	.110	.097	.007	-.014	.103	-.064	-.049	.056	.040	.068	-.096	.201**	.154*	.176**	.194**	.107	.289**	.239**	.369**	.385**	.642**	.595**	1		

9.6 TABLE OF TABLES AND FIGURES