

The role of HR analytics in creating data-driven HRM

Textual network analysis of online blogs of HR professionals

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Krista Jensen-Eriksen

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Author Krista Jensen-Eriksen

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Abstract

The role of HR has developed over time from the administrative function towards more strategic partnership. A major driving force behind this evolution has been the technological development. The collecting, storing and processing of data has been in central role in the gradual evolution of HRM. Still throughout past decades academics and practitioners have questioned the success of HR's development to more strategic role. One challenge has been the ability to produce accurate information of people related issues and make fact-based strategic HRM decisions. In recent years a growing belief have risen that HR analytics could be the answer to these challenges and improve the data-driven HRM in a way that could help HR achieve its strategic position. Still relatively limited amount of research related to HR analytics can be found and therefore its real potential remains to be a question mark. Hence the purpose of this thesis is to deepen the understanding of HR analytics and its implementation. Also the possible connections between HR analytics and broader concept of data-driven HRM are examined.

The research of this thesis is based on data collected from blogs of HR professionals on five major online HR communities in the US and Europe. The data was collected on the basis of predefined keywords and altogether 510 blog posts were collected from the years 2009-2015. The first phase of the data analysis was made by quantitative methods with the software Leximancer, which was then followed by a qualitative analysis aiming to reveal the most prominent discussions of HR professionals related to the implementation of HR analytics and data-driven HRM.

The findings of this thesis indicate that HR is still in its infancy in HR analytics and data-driven HRM. HR as a function is currently routine-oriented and the focus is mainly on universal HR processes and metrics without any further analysis. Data-driven HRM as a term is not yet very widely used among HR professionals. Still it was concluded that in order to achieve the strategic role, HR needs to become more decision-oriented function with the focus of generating value to the business. HR analytics was seen as a possible way to make this happen, although the different possibilities related to HR analytics still remain unfamiliar to most HR professionals and it is currently focused mainly on monetary issues and on descriptive analysis. HR analytics and data-driven HRM was concluded to be context-based, which should be planned and used according to the organisation and its strategy and situation. This means that the successful implementation of HR analytics is depended on the capabilities of the people utilising these tools, their ability to understand how they can be used and knowing what tools to use and when.

Keywords HR analytics; data-driven HRM; HR professionals; online HR communities; Leximancer

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List of abbreviations

BI	Business Intelligence
CEO	Centre for Effective Organisations
CIPD	Chartered Institute of Personnel and Development
DSS	Decision Support Systems
DIKW	Data-information-knowledge-wisdom hierarchy
DW	Data warehousing
EBHR	Evidence-based Human Resource
EIS	Executive information systems
eHRM	Electronic Human Resource Information Systems
ERP	Enterprise Resource Planning
HCM:21	Human Capital Management framework for the twenty-first century
HIPPO	Highest-paid person’s opinion
HR	Human Resource
HR-ACE	HR analytics centre of expertise
HRCS	Human Resource Competency Study
HRIS	Human Resource Information Systems
HRM	Human Resource Management
KPI	Key Performance Indicator
OLAP	Online analytical processing
RBV	Resource-based view
ROI	Return on Investment
SHRM	Strategic Human Resource Management
SHRM	Society for Human Resource Management
SMART	Specific, measurable, achievable, relevant, time-bound
TQM	Total quality management
UK	United Kingdom
US	United States
QIPS	Quality-Innovation-Productivity-Service

1. INTRODUCTION

In recent years, we have seen how almost every aspect of our lives and businesses has been affected by digitalisation. The technologic development is constantly accelerating along with the exponential increase of the amount of data, the growing effectiveness of its storing, and the speed of processing. Software is quickly shifting into the cloud while mobile and social media platforms have become a significant part of our everyday lives. These trends are reshaping firms' organization and management and provide them with unprecedented potential in analytics and forecasting, one area where such developments have been historically important and are likely to continue is the management of human resources (HRM). The development of HRM has evolved almost hand in hand with the technological progress. Data, its storing, processing and utilisation have played a central role throughout HRM's gradual evolution from the basic administrative duties to more recently support the data-driven decision-making, and associated with it strategic role of HR in contemporary organizations. However, throughout past decades both academics and practitioners have been concerned and often sceptical about the speed and ultimate success of HR in this evolution. Recently, there is a growing belief that HR analytics offer a possible solution to ensure and improve the data-driven HRM and, at last, to help HRM achieve its strategic potential. In turn, this thesis examines the HR professionals' perceptions of HR analytics and its implementation in major global online communities in order to deepen the understanding of HR analytics and the broader concept of data-driven HRM.

1.1. Background to the study

The role of HRM has changed over time from the administrator of legal and mandatory human resource practices to more of a supporter of value creation and business strategy (e.g. Ulrich & Dulebohn, 2015; Buller & McEvoy, 2012). Since the early 20th century, the collection and processing of employee data has been the central element in HRM (e.g. Kavanagh et al., 2015). At first, the data was collected in order to keep track of employee information, and then it started to focus on meeting the requirements of the

employment laws (Hendrickson, 2003; Ferris et al., 2007; Kavanagh et al., 2015). As the understanding of employee efficiency and the potential contribution of HRM in it increased, more diverse data started to be collected and, gradually, the role of HRM began to change (Ulrich & Dulebohn, 2015). A major driving force behind this evolution has been the rapid development of information technology (Stone et al. 2015; Strohmeier, 2007). It has enabled more efficient data collecting, processing and storage and, therefore, freed the time of HRM to new roles. At first, HRM was an administrative function that focused on managing employee practices. These needed to be done as efficiently and effectively as possible, because employees were seen primarily as expenses. Gradually, the focus has shifted from expenses to the possible competitive advantage that employees can bring to organisations and, as a result, the role of HRM has started to develop towards being more strategic (Ulrich & Dulebohn, 2015; Schalk et al., 2012 Schuler & Jackson, 2005; Guest, 2011).

Strategic HRM connects HR to the business and, as a basis of this, the critical HRM activities can be developed in order to achieve the strategic business goals and firm profitability (e.g. Schuler, 1992; Walsh et al., 2010). However, despite of its own efforts, HR has not been able to fully redeem its role as a strategic partner. One major roadblock in this development has been the challenge of producing accurate information about people-related issues (e.g. Boudreau & Ramstad, 2004; Bassi, 2011; Lawler et al., 2014).

The HR related data is still often defined as hard to define, difficult to measure and not critical when it comes to business strategy. In addition to this, the data collecting in the past has been more operational and it concentrated more on the HRM itself, and not its effect on the business (Lawler et al., 2004). The data-driven HRM is perceived as a possible way to tackle this challenge (e.g. Lawler et al., 2004; Welbourne, 2015; Pape, 2016). Data-driven is often defined as something that is based on data and facts instead of intuition or personal experience (McAfee & Brynjolfsson, 2012; Rasmussen & Ulrich, 2015). In addition to the data-driven measuring and decision-making, it has been argued that HR needs to embrace an outside-in approach (Ulrich & Duhlebohn, 2015; Brockbank, 2015; Rasmussen & Ulrich, 2015). This means that if HR wants to fully validate their role as a true strategic partner, they do not only have to be able to make

data-driven decisions, but also need to relate these decisions to what happens outside the organisation, on the business context and external stakeholders, particularly the customers.

HR analytics has been a rising trend in HRM for the past few years and many believe that it may be the answer to the challenges HR is facing. Through data analytics, the goal is to transform large complex masses of data into knowledge and, in this way, help the decision-making process of HRM by helping to make more accurate and data-driven decisions and also to make a forecast about the future, not just describe the past (Rasmussen & Ulrich, 2015). Basic reporting, benchmarking and scorecards have gradually made room for more complex analytics and now predictive analytics has led to the possibility of prescriptive analytics. Thus, the focus of decision-making could move from the past to predicting the future and, therefore, also the measuring in HRM could start to be more proactive rather than reactive.

Despite of the big promise of HR analytics, its real value and advantage continues to be a question mark, and relatively little published research exists about the issue. A recent Deloitte report stated that a third of the companies state that HR analytics is under active development, but only eight per cent of them claim to have strong analytics capabilities (Deloitte, 2015). In addition, they show little sign of improvement compared to the previous year, indicating thereby that the expectation of HR analytics may not have yet evolved into reality.

1.2. Research problem and gap

The discussion that is currently taken place with the HR analytics, at least in the academic literature, is firmly tied to the role and decision-making processes of HRM. It is obvious that these trends and technological developments are also reshaping the expectations of what value HRM could and should produce in the future, yet the value-creating potential of HR analytics remains unclear (e.g. Fitz-enz, 2010; Levenson, 2013; Rasmussen & Ulrich, 2015). According to Rasmussen & Ulrich (2015), the published evidence that HR analytics is supporting value creation and the business strategy is quite slim and many organisations are still at the early stages of HR analytics (Roberts,

2013). However, there also can be found some examples to the contrary. Companies like Google and IBM have already taken bigger steps to get a head start in the area of analytics. Still, these are just a few examples and more research is still needed on how organisations actually implement HR analytics and to what effect.

There is no clear understanding of how HR professionals utilise HR analytics and to what effect. More research is still needed on how they understand the role of HR analytics as a part of the broader concept of data-driven HRM. Or do they, in general, connect HR analytics to the measuring and decision-making processes of HRM?

1.3. Research objectives and questions

On the basis of the background and research problem, the objective of this thesis is to deepen the understanding of HR analytics and its implementation. In addition to this, the possible connections between HR analytics and the measuring and decision-making of HRM are also examined. This is done in order to understand if and how HR analytics is connected to the broader concept of data-driven HRM.

The theoretical framework is then reflected on the empirical material. This is done by identifying the meanings that HR professionals are giving to HR analytics in blogs in major online communities.

The main research question then is the following:

- *How do HR professionals in online HR communities perceive HR analytics?*

This research question is supported by the following sub-questions, which also guide the theoretical literature and empirical part of the thesis:

- *How do HR professionals utilise HR analytics?*
- *Do HR professionals perceive that HR analytics affect the measuring and decision-making processes of HRM and, if so, how?*

The first sub-question of the study is aimed to deepen the practical understanding of HR analytics. The goal is to examine how HR professionals understand and implement HR

analytics, and to what effect? The second sub-question again addresses the measuring and decision-making processes and their development in HRM. The aim is to examine the possible connection between HR analytics and data-driven HRM. Do HR professionals perceive this connection or not? The overall objective of the present thesis is to deepen the understanding of HR analytics and examine the current issues of HR analytics implementation and also to propose a potential implication of using HR analytics for the data-driven approach to HRM.

1.3. Scope and delimitations of the study

The focus of this study is to examine the HR professionals' perceptions concerning HR analytics and data-driven HRM, as represented in their online blog posts. In turn, blogs are selected from major online HR communities in the US and Europe that are deemed to influence practitioner opinions by establishing professional standards and certificates, providing education and training, and informing them of the latest trends. In aggregate, these blogs are expected to portray the latest professional developments and experiences of professionals with HR analytics. Hence, the data is collected only from professional online communities, rather than personal blogs of influential experts and thought gurus, whose opinions while interesting may also be potentially biased.

Moreover, the scope of this study is limited to HR professionals' subjective evaluations and opinions at the macro level, and no objective measures concerning HR analytics are collected. Consequently, it is not possible to evaluate potential costs, benefits, and other tangible outcomes of analytic implementation. Furthermore, it cannot be analysed as to how representative the sample of HR professionals is, for example, related to where they work or whether they have used analytics. The data was collected with the predefined keywords and, therefore, includes only a limited number of blog posts found in these online communities. This restriction was partly affected by the limited amount of time and resources available for the master's thesis.

1.4. Structure of the study

This study is divided into six main chapters. After the introduction in the first chapter, the second chapter presents the literature review of this study in which the goal is to offer a comprehensive overview of the academic literature concerning HR analytics and the broader concept of data-driven HRM. In the third chapter, the description of the empirical data collection and analysis is presented in more detail in order to justify the choices, which have been made in the empirical part of this study. In the fourth chapter, the analysis and findings of the empirical research are presented and, again in the fifth chapter, the existing theoretical framework is reflected on the empirical findings. The final chapter of this study outlines the key findings of this study, presents a general valuation of the study and suggests ideas for future study.

2. LITERATURE REVIEW

The key objective of this literature review is to provide a comprehensive overview of the academic literature about HR analytics and data-driven HRM as well as describe the way these two concepts link together on the basis of the academic studies. In order to do this, it is necessary first to understand how the role of HRM has evolved over time and how the technological development and data processing have been an integral part of this transformation. This, in turn, provides the basis for examining and understanding the development of data-driven measurement and decision-making processes of HRM. After examining and describing the data-driven HRM more closely, the focus is directed on the HR analytics i.e. how it can be defined, what is it used for and how it is connected to the wider concept of data-driven HRM.

The structure of this section is the following. The first part focuses on the background of this literature review. First, the concept of HRM is defined. After this, the overall evolution of HRM is examined, which has been affected by multiple factors, especially the technological development. Then, the concept and overall development of strategic HRM (SHRM) is described. This part also illustrates how the development of SHRM has influenced the role and perspectives of HRM and what demands this place on the decision-making processes of HRM.

After setting the scene, the literature review focuses more closely on the data-driven measurement and decision-making processes in HRM. It first examines how the evolution of HRM from personnel administration to SHRM has affected people management and related decision-making from the perspective of Boudreau and Ramstad's (2007) framework. After that, this section re-examines more closely the definitions linked to data-driven HRM and specifies what is meant by data. Then, the focus is directed on the measuring and metrics of HRM. Along with the development of HRM and technology, HRM measurement and metrics have also gradually evolved from simple cost and efficiency measures internal to the HR function to become closer associated with the wider business context. Still, the metrics are only one part of HRM

decision-making, therefore, the next section focuses on examining the overall decision-making processes, and discusses the role of data and metrics in these processes.

The third part of the literature review focuses on the HR analytics. This section first defines the concept, and discusses different levels and types of HR analytics, the ways in which it is utilised, what actors are key to these processes. Finally, the challenges and possibilities related to HR analytics are presented. The literature review is concluded by a summary of presented topics, and the various themes are drawn together to form an overall picture of the literature review of HR analytics and data-driven HRM.

2.1. Background

2.1.1. HRM

Human resource management (HRM) focuses on employee management and processes and it refers to “all those activities associated with the management of work and people in organizations” (Boxall & Purcell (2011: 1). It takes into account both the individual and collective aspects of people management and it is an inevitable part of starting and growing organisations (Boxall & Burcell, 2008). In practice, HRM can be divided into four different areas: people, performance, information and work (Ulrich & Dulebohn, 2015). (1) The people aspect refers to the human side of HRM, i.e. workforce management in organisations and in practice this refers to such HR practices as workforce planning, staffing and development. In turn, (2) performance refers to how employees accomplish their work and how this can be measured and developed in practice. Finally, (3) the information aspect describes how information is shared within the organisation, whereas (4) work refers to the methods by which the work itself is done inside the organisations. It includes things like workforce policies and physical settings (Ulrich & Dulebohn, 2015). The overall HR practices can be examined through three different levels in the organisations, which are the operational, managerial and strategic level (Dulebohn & Johnson, 2013). HR practices manage both human (people) and social (interactions between people) capital, which are nowadays perceived as possible sources of competitive advantage (e.g. Schuler & Jackson, 2005; Boudreau & Ramstad, 2007; Buller & McEvoy, 2012).

2.1.2. Evolution of HRM and HRIS

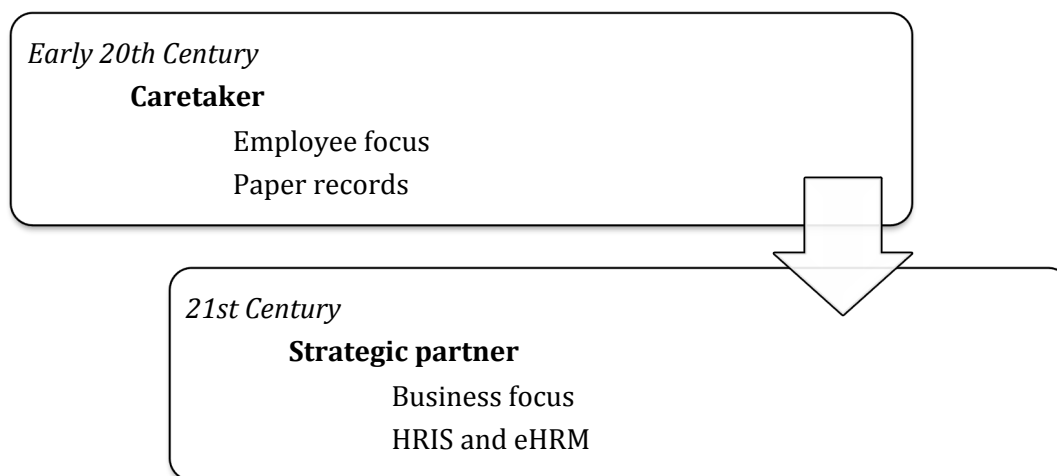
The role and nature of HRM have changed and evolved greatly over time. The role of HRM has changed from the administrator of legal and mandatory human resource practices to more of a strategic business partner and core business function (e.g. Ulrich & Dulebohn, 2015; Buller & McEvoy, 2012). This evolution has been affected strongly by the technological development. It has transformed the HR processes as well as the way that the work is done and managed in the organisations (e.g. Stone et al. 2015; Strohmeier, 2007). HR processes, mainly in terms of data collecting, storing and utilising, are now largely on automatized, which has released the resources of HRM to more strategic work. At the same time, the technological development has affected the nature and management of work as well as the interactions between employees, which can be seen for example in the evolution of virtual teams and remote work.

This overall evolution of HRM has had a major effect on HRM on the practical level as well as the overall focus of HRM. According to Ulrich and Dulebohn (2015), the goal of HRM is to continuously create value for organisations and, when looking back in history as to the way HRM has added value, it is seen to have changed significantly over time. In the administrative period of HRM, the value was added mostly with the cost-effective HR practices, while in the strategic HRM the focus is on generating value for the overall business, for example, by developing the employee engagement in order to improve customer satisfaction.

Historically, the collection and processing of data has played a major role in HRM and HRM has evolved over time together with the help of technological development, which is described in Figure 1. The roots of HRM are in the economic development and industrial change (e.g. Ulrich & Dulebohn, 2015; Cohen, 2015). Prior to World War II, in the early 20th century, personnel function or management was mainly concentrated on the record keeping of employee information and its role was more of a “caretaker” (e.g. Hendrickson, 2003; Ferris et al., 2007; Kavanagh et al., 2015). Personnel departments were established in order to “centralise employment related activities and to oversee employee related practices” (Ulrich & Dulebohn, 2015: 189). Labour was seen as a factor of production, and the management was strongly affected by the scientific

management of Frederick W. Taylor, who emphasised the maximising of employee productivity and best practices of the work (e.g. Ferris et al., 2007; Ulrich & Dulebohn, 2015; Cohen, 2015). This also formed the bases for the piece-rate pay systems. At this time, the government supervision of employment relations was minimal, and most of the issues were left to company owners to decide (Kavanagh et al., 2015). The information collected by organisations was stored as paper records.

Figure 1. Role of HRM



(Adapted from Kavanagh et al., 2015: 7)

In the **Post-World War II period (1945-1960)**, managers started to realise that employee productivity and motivation impacted the profitability (e.g. Ferris et al., 2007; Ulrich & Dulebohn, 2015). Job descriptions were created and labour unions were born (Cohen, 2015). Because of the increase of employment laws, more record keeping and reporting in organisations was needed (Kavanagh et al., 2015). The defence industry was the first one to utilise the emerging computer technology in job analysis and classification data (Kavanagh et al., 2015). Outside the defence industry, computers were used mainly in billing and inventory. The first mainframe computer systems were introduced, which automated some of the HR record keeping and payroll (Stone & Dulebohn, 2013). However, at this time the computer technology was still complex and costly, and thus available only to a fraction of large enterprises (Kavanagh et al., 2015).

During the **Social Issues Era (1963-1980)**, labour legislation increased and, as a result, the personnel departments' administrative work was growing exponentially, requiring much more data to collect and report on (Kavanagh et al., 2015). Concurrently, the personnel departments themselves were transforming into HR departments and their role merged into more of a protector rather than caretaker, particularly due to the rising amount of labour legislation (Kavanagh et al., 2015). There was a growing need for more efficient and effective ways to process employee information. The computer technology was evolving as well, improving the product functionality while lowering the prices. In the 1980s, the first standalone software packages, referred to as human resource information systems (HRIS), were developed (e.g. Hendrickson, 2003; Stone & Dulebohn, 2013). These systems allowed organisations to collect, stock and utilise data to support HRM and facilitate HRM functions, for example recruiting, training and development, although human resource professional were dependent on IT experts on the use of these HRIS systems (Stone & Dulebohn, 2013).

Bigger change was seen in 1980 (e.g. Schuler & Jackson, 2005; Guest, 2011). The role of HR began to change and HR was seen more as a part of the core business that could have an effect on the efficiency and effectiveness of organisations (Ferris et al., 2007). In order to achieve this, human resources needed to be managed more systematically and also the capabilities and competencies of HR professionals needed to be developed (Schuler & Jackson, 2005). In this **Cost-Effectiveness Era (1980 to the Early 1990s)**, the focus changed from previous employee administration to employee development and the need for cheaper and more powerful technology emerged (Kavanagh et al., 2015: 11). Computer based systems became even more affordable and available to an increasing number of different sized organisations. In the late 1980s, microcomputers emerged, which were user-friendly and cost-effective (Hendrickson, 2003; Stone & Dulebohn, 2013). The more transactional activities could be handled with computers and more concentration could be focused to the transformational activities that would add more value to organisations (Kavanagh et al., 2015).

In the **Technological Advancement Era (1990 to present)** radical changes came with increasing globalisation and technological breakthroughs (Kavanagh et al., 2015). In the 1990s, HRIS could already manage multiple HR functions and also more sophisticated

management and reporting qualities were developed (Hendrickson, 2003; Stone & Dulebohn, 2013). These systems functioned as a “standalone or a part of the enterprise resource planning (ERP) software” that made it possible to link HR systems to other organisational data (Stone & Dulebohn, 2013: 2). The next phase of HRIS was the utilising of the intranets (e.g. Lengnick-Hall & Moritz, 2003; Stone & Dulebohn, 2013; Heuvel & Bondarouk, 2016). This made the use of wider organisational information possible. It also gave the internal stakeholders the possibility to access HR information and the ability to manage HR processes. When the Internet emerged in the mid-1990s, it enabled the two-way communication and easy access of information over the Web (Stone & Dulebohn, 2013). At the end of 1990, web services started to be developed and also HR software that was compatible with the Internet architecture, and at the start of the 2000s, it was already possible to access HR data at any time or place (Stone & Dulebohn, 2013). Web-based technology became more and more common and organisations used it to integrate with both the internal and external stakeholders, for example managers, employees and job applicants (Lengnick-Hall & Moritz, 2003). These systems came to be called electronic human resource information systems (eHRM), which enabled web-based HR transactions (Marler & Fisher, 2013; Stone & Dulebohn, 2013; Macky, 2015; Heuvel & Bondarok, 2016). These systems could be accessed through the Internet or the intranet of an organisation (Lengnick-Hall & Moritz, 2003) and could be utilised, for example, electronic job analysis and applications as well as performance management and e-learning solutions (Stone et al., 2015). eHRM systems are perceived to reduce cost and increase speed of delivery, but on the other hand to focus on mass implementation that does not take into account the more specialised services (e.g. Stone et al., 2015).

Stone et al. (2015) as well as many others (e.g. Hendrickson 2003; Marler & Fisher, 2013) have argued that in addition to the major effect that technology has already had on the evolution of HRM, this development will also continue in the future. It can be concluded that the cloud and also mobile HR software are making their way into HRM more strongly allowing for more flexible use and constantly evolving software. Consumer apps are popular and, alongside them, workforce apps are starting to emerge. Different kinds of apps are already used to increase task efficiency for example in

recruitment, but the use is still limited to core HRM processes (Gale, 2015). There has also been increasing focus on Decision Support Systems (DSS) and Business Intelligence (BI) tools within HRIS, which make it possible to combine HR data and other organisational data in order to provide more developed analytical tools and enable better decision-making between business management and HRM (Dulebohn & Johnson, 2013; Pape, 2016). At the same time, more and more discussion about big data has emerged. As the amount of data increases exponentially, the ways that it can be processed and analysed also develops and accelerates which may offer novel ways of turning that data into insights for strategic decision-making. Still, as the technological development continues, also the small and mid-sized organisations will be able to utilise different eHRM and HRIS tools more widely in the future.

2.1.3. The development of strategic HRM

In the previous section, the historical evolution of HRM was examined and in this part the analysis is deepened by describing the emergence and development of strategic human resource management (SHRM). The concept of SHRM was first introduced about 30 years ago and still today the concept is used very broadly and multiple definitions for it can be found (e.g. Schalk et al., 2013; Jackson et al., 2014). Usually SHRM is argued to be based on the strategic role of HRM, which connects HRM to the broader business environment, both internal and external stakeholders. It refers to the critical HRM activities that are developed in a way that helps organisations to achieve their strategic business needs and firm profitability (e.g. Schuler, 2013; Walsh et al., 2010).

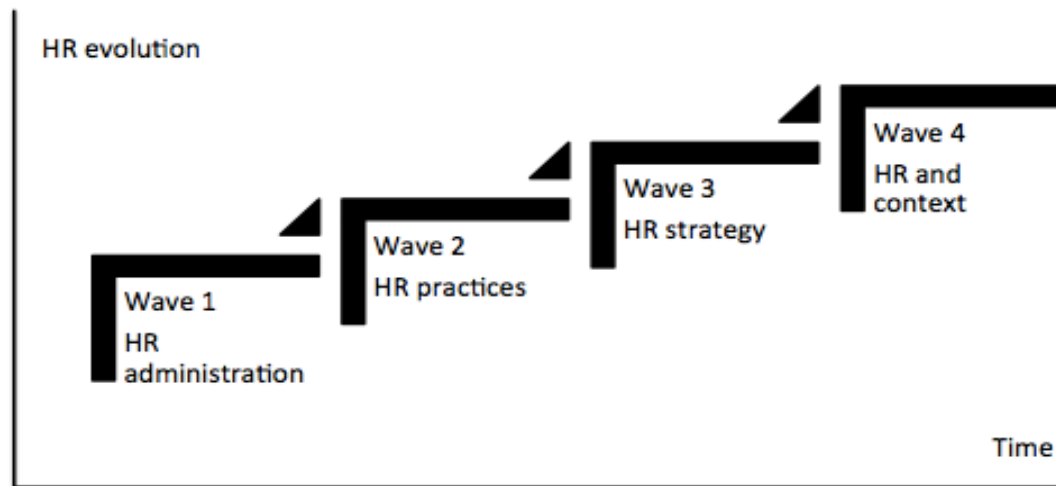
The birth of SHRM is closely linked to the wider concept of strategic management (Jackson et al., 2014). Both of these have been strongly affected by the major global trends that have increased the understanding that business decisions should be based on the external environment (Pferrer & Salancik, 1978). The transformation of HR that started in the 1980s from an administrative maintenance function to a core business partner was sped up by the major environmental and organisational changes (e.g. Ulrich & Dulebohn, 2015; Schalk et al., 2013). These changes included significant trends like globalisation, demographic changes, technological development and the transformation

to a knowledge and service-based economy. The transformation was shown in the way term human resource management placed the term personal management and gradually discussions about the connection between business strategy and HRM began to evolve (Schuler & Jackson, 2005; Guest, 2011).

First, early-sited academic articles of SHRM were published already in the 1980s (e.g. Jackson et al., 2014; Schalk et al., 2013). At the beginning, the discussions focused more on the alignment between HRM policies and practices and the business strategy, but gradually the overall HRM function started to be examined from the strategic perspective and the business needs (e.g. Devanna et al., 1981; Marler & Fisher, 2013; Jackson et al., 2014). Currently, SHRM is focused on two different forms of resources (Walsh et al., 2010). These are the human capital and the HR processes and practices that support the development of the first one. Human capital is often defined as the “knowledge, skills and abilities” of employees (e.g. Buller & McEvoy, 2012). In the resource-based view (BRV), these are considered as one major source of advantage that can lead to superior performance and create value and competitive advantage to organisation (e.g. Barney & Wright, 1998; Buller & McEvoy, 2012).

Ulrich & Dulebohn (2015) have divided the overall transformation of HR and SHRM into four different periods as seen in Figure 2. The administrative wave of HR was first, where HR was seen through administrative functions and delivering HR services. The focus in this stage was in the administrative efficiency of HR and the goal was to develop the processes in a way that this could be achieved, for example transferring the daily responsibilities more to the line managers. This period is still separate from the previous mode as the HR is already recognised more as a core business function, not just a maintenance administrator. The second wave was the HR practices wave where the goal was to develop more innovative HR practices. The focus was on HR professionals and their ability to design more developed and customised HR practices for organisations, not just to be passive administrators. The third wave was the HR strategy wave. In this stage, HR practices are planned according to the business strategy and the role of HR is changing from handling administrative functions or designing HR practices to implementing and sometimes even developing business strategy (Ulrich & Dulebohn, 2015).

Figure 2. Transformation of HR



(Adapted from Ulrich & Dulebohn, 2015: 190)

Lawler & Mohrman (2003) have again separated three different levels of involvement when linking HR to the business strategy, which are (1) implementation, (2) input and (3) implementation and full partnership. Implementation is the lowest level of strategic involvement and HR role is limited to carrying out something that is already planned. The goal is to plan the HR practices that support the implementation of the strategy. In the second stage, HR also offers information to the planning team so it is involved indirectly in the strategic planning in addition of the implementation. In the third stage, HR is a full member of both the strategic planning as well as the implementation.

According to Ulrich & Duhlebohn (2015), this is still not enough. HR needs to move further from the full partnership of wave 3. This means a transition from an inside/outside to an outside/inside approach, which means changing the focus to the “disciplined line-of-sight to the outside” instead of “the limited line-of-sight to internal operation” (Brockbank, 2015: 319; Rasmussen & Ulrich, 2015). As a result, the focus of HR is no longer in serving the employees or in improving HR services. Ulrich & Dulebohn (2015) propose that, in addition to connecting HR to the business, HR also needs to connect to varied stakeholders and the broader business context in which an organisation operates. Levenson (2013) argues that HRM needs to understand the customer behaviour as well as the business processes in addition to the employees. This

wider perspective again provides the basis for the decision-making in HRM. HR can create value by aligning the HR inside the organisation to the expectations from outside the organisation. This way, the HRM is not just responding to the strategy, but is also shaping and creating it from outside in. In order to achieve this, transition in the targets or outcomes of HR is also needed. Instead of focusing solely on improving the efficiency and productivity of HR and employees, the key question is how these are linked to the strategy of the organisation. This requires reflection on what kind of talent, capabilities and leadership is needed in order to accomplish the strategic goals.

Ulrich & Duhlebohn (2015) see that re-directing HR resources is also needed. This would mean the re-organisation of the HR department in a way that it would be better aligned with the wider business environment and work as a professional service organisation within the organisations. HR practices would then be aligned with the strategy and external environment, integrated with the internal scope and developed as more innovative processes (Jackson et al., 2014). These changes would also demand for increased competencies from the HR professionals to cope with inside and outside the organisation (Ulrich et al., 2013).

Brockbank (2015) concluded that the high-performing organisations that he has studied have aligned the HR practices with external customers by adopting the outside in – perspective. However, if HRM becomes more aligned with strategy, this also causes pressure on the measurement of human capital decisions and how it can be connected to the overall business (e.g. Lawler et al., 2004; Mondore et al., 2011). It also places pressure on the HR professionals who need to have an understanding of how these metrics can be used as a tool to support decision-making (Ulrich & Duhlebohn, 2015).

2.2. Data-driven HRM

As described in the previous chapter, HRM along with the technology has made a major evolution over time, which also reflects on the measurement and decision-making processes of HRM. Although this is well recognised, a lot of uncertainty is still associated with these issues. In the academic literature, this is often described as “the black box” of HRM, because of the gap between HR initiatives and return on

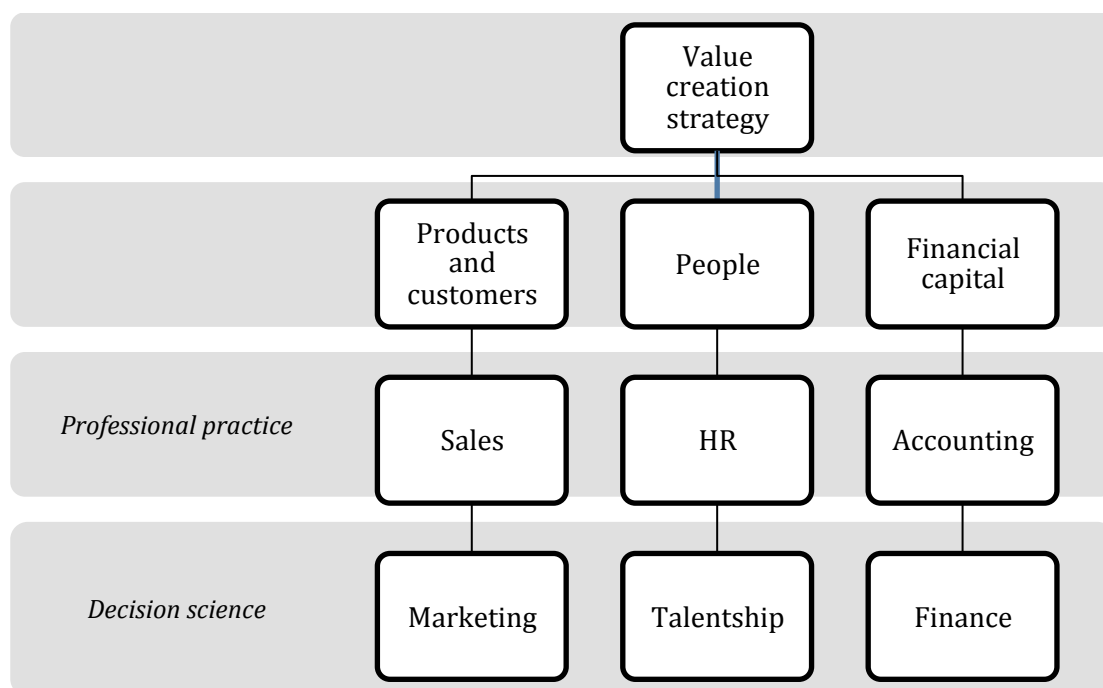
investment (ROI) that can still be found (e.g. Boudreau & Ramstad, 2007; Boselie et al., 2005; Walsh, 2010; Jackson et al., 2014). There is still a lot of uncertainty on what can be defined as the tactical and what again the most strategic factors when contributing to the overall business and this again reflects on how these can be measured and eventually managed. When it comes to employee engagement, for example, many organisations still fumble when explaining what it actually means and how it can be managed or measured.

Many scholars have argued that one key factor in the transition of HRM to a strategic partner is the data processing, analysing and measuring that function as the basis for the HRM decision-making (e.g. Lawler et al., 2004; Walsh, 2010). Boudreau & Ramstad (2007) have concluded that a paradigm extension is needed in the way the HRM has traditionally been seen as a function. They claim that although HRM has started the transition to a strategic partner and it is understood that this kind of transition is need, the traditional paradigm is still strong. This paradigm focuses on the services that HRM provides and these services again reflect something that is already defined. In the extended paradigm, the services have not been forgotten, but the overall mission of HRM starts already with the decision-making on the strategic level and it can be described as the following: “the mission of the HR function is to increase the success of the organisation by improving decisions that depend on or impact people” (Boudreau & Ramstad, 2007: 9). This aspect of Boudreau and Ramstad in a way reinforces the outside/inside approach of HRM described in the last chapter. Boudreau & Ramstad (2007) illustrate this decision focus transition of HRM by comparing it to the transitions from product-based to solution-based sales. Traditionally, the focus of sales has often been in the selling of predefined products. However, gradually the focus has now shifted from selling single products to solving the customer’s problem and thus new ways of delivering value to customers can be shown.

Boudreau & Ramstad (2007) argue that the decision focus of HRM results in the polarisation of the HRM function seen in Figure 3. In this transformation, the decision science and the professional practices will be divided into two separate functions. This evolution has already happened with accounting and finance and with sales and marketing. For example, in financial management, accounting represents the

professional practices and finance again the decision science. Similarly in HRM, the administrative human resources are still needed, but in parallel with it a new decision science needs to be developed. Boudreau & Ramstad (2007) describe this as the “talentship”, which does not focus on the best practices of HRM, but goes further by focusing on human capital decisions, which can enable new ways to generate a competitive advantage for the organisations.

Figure 3. From professional practice to decision science



(Adapted from Boudreau & Ramstad, 2007)

As already mentioned earlier, the decision-making in HRM is often described as slow and inaccurate (Stephenson, 2011). This can be addressed in more detail with two different questions: (1) how can the value of human capital be recognised and (2) how can better decisions be made related to the human capital investments. Human capital can be described as a type of intangible asset, which differs from the other capital of organisations for example financial capital or physical products (Walsh et al., 2010). Examples of these intangible assets are “leadership, engagement, culture, commitment, loyalty and employer brand” (Fitz-enz & Mattox, 2014: 18). The costs related to the human capital, for example wage costs, are often more easily defined and predicted than the outcomes of human capital, for example employee performance or employee

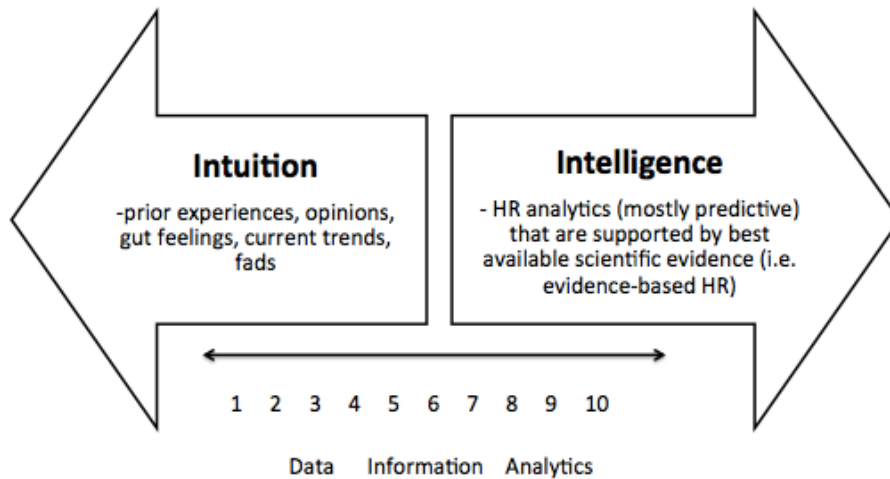
engagement. This often leads to the conclusion that human capital is treated as expense instead of asset and the decisions concerning HRM are made on the basis of minimising the costs (Walsh et al., 2010).

Lawler et al. (2004) have argued that HRM is left behind as a strategic value producing function compared to finance and marketing, because of the lack of the proper metrics and analytical tools for decision-making. The data-driven HRM is perceived as a possible way to tackle this challenge (e.g. Lawler et al., 2004; Welbourne, 2015; Pape, 2016). Data-driven HRM is often defined as something that is based on data and facts i.e. evidence instead of intuition or personal experience (McAfee & Brynjolfsson, 2012; Rasmussen & Ulrich, 2015). Still, when examining the fact-based decision-making of HRM more closely, it can be noted from the academic literature that the concepts surrounding this theme are still not fully established. When talking about fact-based or data-based decision-making, it is often referred in the literature as “data-driven” or “evidence-based” HRM. The term “HR intelligence” is also used although it does not yet seem to be very widely used term at least not in the academic literature and consequently its definition is also not fully established. For instance, the existing definition formulated by Falletta (2008: 21) is as follows:

“...proactive and systematic process for gathering, analyzing, communicating and using insightful HR research and analytics results to help organizations achieve their strategic objectives.”

According to this definition, HR intelligence is based on both scientific evidence and HR analytics and, therefore, supported by both empirical and theoretical research (Falletta, 2014). According to Falletta (2014), HR intelligence can be described with value chain seen in Figure 4. She stated that the framework is not an accurate scale of measurement, but functions more as a practical tool to support thinking. On the basis of this model, HR intelligence can be seen as an opposite to intuition. When using intuition decisions are mainly based on experiences, opinions, instinct as well as trends and maybe even on fads. HR intelligence again is based on both HR analytics and the best-available scientific evidence.

Figure 4. HR intelligence value chain



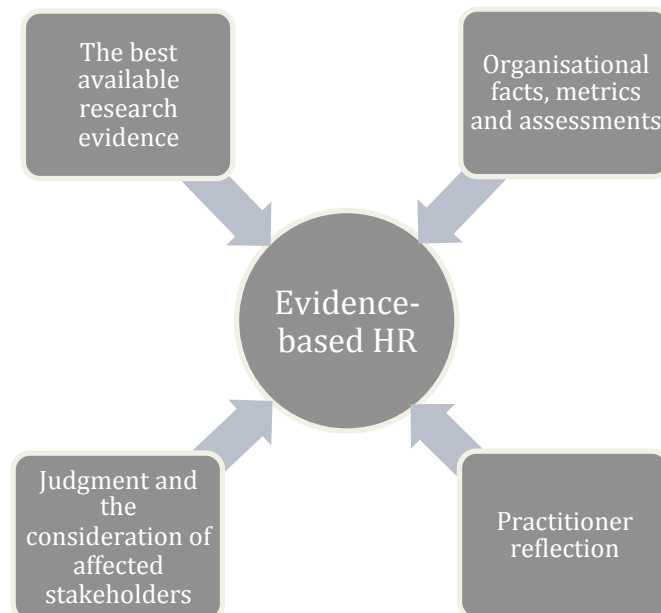
(Adapted from Falletta, 2014)

The interesting fact seen in figure 4 is also the reference to scientific evidence as “evidence-based HRM”. As mentioned earlier, evidence-based HRM is often used to describe also wider fact-based approach to HRM for example in the HR measuring or analytics. However, as shown here, it has been recently linked to the scientific literature. For example, Pferrer & Sutton (2006) have stated that the decision-making processes of HRM are often based on fads, trends or presumptions and that a more scientific and empirical approach is needed. Hence, there can be found a lot of scientific research material and results concerning HRM, which could be utilised more effectively in a way that have been done in for example in medicine. Evidence-based HR (EBHR) can then be seen as a decision-making process that combines “critical thinking with use of the best available scientific evidence and business information” (Rousseau & Barends, 2011: 221). According to Rousseau & Barends (2011: 224) as well as Rousseau (2006) it is built based on four elements as seen in Figure 5: (1) the best available research evidence, (2) organisational facts, metrics and assessments, (3) practitioner reflection and (4) judgment and the consideration of the affected stakeholders.

Rousseau & Barends (2011) argue that in the field of HRM there is a substantial amount of scientific research that can be utilised in the decision-making processes of HRM. Imitation or copycatting practices from other companies again can be seen as the contrary to this critical thinking (Rousseau & Barends, 2011). Rousseau & Barends

(2011) demonstrate that learning from others and merely copying it is not evidence-based because something that works in one organisation does not necessarily work in other. In the academic literature, this is typically described as the path-dependent thinking, which takes into account the history and context-specific factors affecting the decision-making (e.g. Lehto & Lamberg, 2010). The essential factor in EBHR is what Rousseau & Barends (2011) call “mindfulness”. By this they mean active scepticism and questioning of the quality of decisions. It is about personal opinion versus scientific evidence. The focus is on explicit decision-making, which has two parts. The decision awareness is first, more specifically, paying attention to the micro-decisions made multiple times during the day and becoming aware of all the choices that are made on a daily basis. The second takes into account the quality of decisions and using or creating appropriate decision-making tools for example different checklists or decision templates. These include balanced scorecards and total quality management (TQM), ISO 9000, Lean and Six Sigma (Carson & Kavanagh, 2015).

Figure 5. EBHR elements



(Adapted from Rousseau & Barends, 2011)

Hirsh & Briner (2011) challenge the arguments of Rousseau & Barends (2011) by stating that in their studies most of the HR professionals did not see EBHR primarily as a scientific related issue. Rather, they thought of it more as a tool that enhances the internal information sources and external networking and benchmarking. Hirsh & Briner (2011) also raised the question of the somewhat problematic approach of the EBHR to academic research. They argued that because of the large amount of studies made, it is not very simple to form a clear picture of the best empirical evidence available.

For clarity and on the basis of these previous arguments, in this thesis I use the term “data-driven HRM” to describe the data-based decision-making and measurement of HRM. More specifically, the data-driven HRM in this literature is examined with three different levels, which are (1) data, (2) measuring and metrics and (3) the decision-making of HRM. First, the concept of “data” is defined and described, because it forms the foundation for the data-driven HRM. Then, the measuring and metrics of HRM and their development are examined and finally the decision-making of HRM is defined and described more closely. The background presented in the previous section forms the basis against which the data-driven HRM can be examined. The development of HRM and technology has had a major effect on the data-driven HRM, which can be perceived more clearly through the different levels of data-driven HRM in the next section. Technological developments have also enabled and created novel analytical tools for HRM, which has broadened the possibilities of data-driven HRM. These are described in more detail in the following chapter after the overall description of data-driven HRM.

2.2.1. From data to big data

As mentioned earlier, data forms the foundation for the data-driven HRM. Because data-driven HRM is based on data and facts, these first need to be defined. Traditionally, HRM has collected a lot of data, but it has not often had a clear understanding of the ways that it can be utilised. The focus has been more on the organising and storing of the data rather than on how it can be turned into meaningful insights for the basis of the decision-making. However, now that the role of HRM is changing to be more strategic, the demands on the decision-making of HRM also

increases, which starts with the data. Many challenges concerning it have been identified when the first steps towards more data-driven HRM have been taken. Some of these typical challenges are presented in Table 1. (e.g. Roberts, 2009; Douhitt & Mondroe, 2013; Naasz, 2015). From this list, it can be noted that the data is often perceived as inaccurate, useless and past related. A lot of challenges also relate to the utilising of the data. Data can be found in different forms, systems and departments, which are not often easy to combine. It also can be questioned as to how it can be known which data is relevant and how the correlations to the business outcomes can be identified.

Table 1: Challenges of HRM data

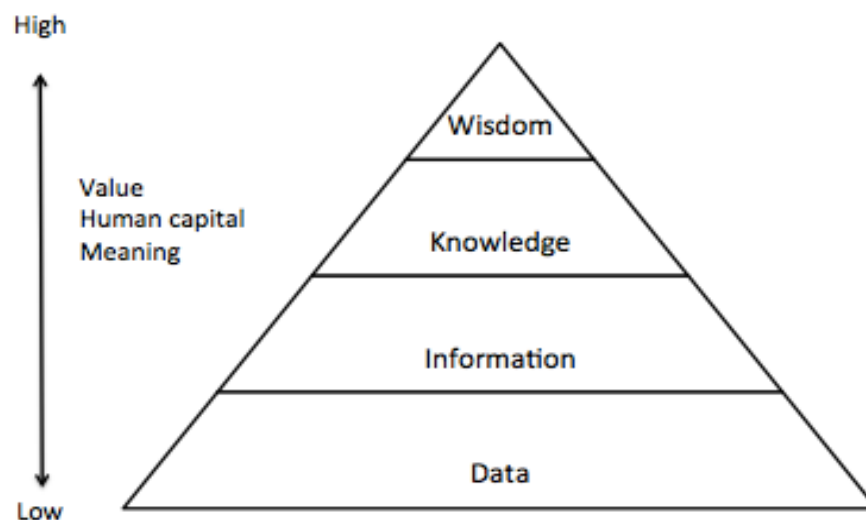
Challenges of data in HRM

- Receiving inaccurate data
- Receiving a lot of useless data
- Data focuses on the past
- Not getting data from other departments
- Data in different systems and forms that cannot be combined easily
- Collecting data that HR is accustomed to collecting
- Counting on gross numbers (average can be misleading)
- Not understanding how the HR data is connected to the business data
- Not identifying the correlations and causation of the data
- Identifying what data is relevant

In order to understand the processes of turning data into insights and building material for the strategic decision-making of HRM, first there is the need to comprehend what data is and the different levels of it and the connections between them. Data is often defined with the help of a data-information-knowledge-wisdom hierarchy (DIKW), also known as the “Knowledge Hierarchy” or “Knowledge Pyramid” (Ackoff, 1989). This model defines the different levels of information and the hierarchy and the processes of transformation from one level to another. According to Ackoff’s original idea, the higher levels include the lower levels when “climbing” up the pyramid. Later on, there has been a lot of discussion about the processes that transform the data into knowledge,

but no clear consensus on the subject exists as of yet. Rowley (2006) has studied the academic literature of the different interpretations and models and tried to find answers to the questions what is data and how it can be developed. She came to the conclusion that most scholars see that the key elements of the DIKW pyramid are data, information, knowledge and wisdom as seen in Figure 6.

Figure 6. The wisdom hierarchy



(Adapted from Rowley, 2006: 176)

In the different studies, “elements are usually arranged in the same order” and “the higher elements of the hierarchy can be explained with the help of lower elements” (Rowley, 2006: 168). The challenge, however, has been the ability to understand the transformation process from one level to another. It also can be wondered that is there really a sharp line between the different levels or can the development be described more as a continuum from level to level (Rowley, 2006). In general, it is often seen that the upper parts of the pyramid bring more value and meaning, but also demand more human input than the lower ones and again the lower parts of the pyramid need more computer input and programmability than the higher parts (Rowley, 2006). When this is examined in HRM, the same insights can be made. As mentioned earlier, HR has a lot of data, but in order to be utilised, it needs to be refined into wisdom. This requires human input and understanding of what the desired outcomes are. Rowley (2006) concluded that in the lower levels of the DIKW more computer input and

programmability can be utilised than in the upper levels. However, it can be argued that although the technological development and more sophisticated tools have enabled more complex and novel data analysing methods than before. Still, human judgment is needed to transform the data processing results into insights. Next, the different levels of the DIKW are examined more closely in order to understand and identify the different forms of data.

The first level is data, which Ackoff (1989) described as products of observation that are not in useable form. Data exists and it does not have any specific meaning. It is often described as lacking something for example meaning and value. Rowley (2006) describes data as unorganised and unprocessed. Information again is the second level of the DIKW Pyramid, which refers to data with a meaning (Ackoff, 1989). Rowley (2006) argue that it is often described as organised or structured data. According to Fitz-enz & Mattox (2014), structured data is more traditional and it refers to the financial data like costs and quantities. Unstructured data again refers to the economic or less tangible data, for example nonnumeric images, text and audio (Fitz-enz & Mattox, 2014). The focus traditionally has been more on the structural data for example in costs and process time cycles. However, the amount of unstructured data increases all the time due to, for example, social networking and the overall digitalisation. Fitz-enz & Mattox (2014) also make a separate division addition to these two by distinguishing hybrid data from the previous, which is a fusion of a structured and unstructured data. This kind of data is also increasing continually. The increasing amount of unstructured and hybrid data brings a lot of novel possibilities to utilising data, but also challenges because the analysis processes become more complicated (Fitz-enz & Mattox, 2014).

Knowledge is the third level of the DIKW Pyramid. It answers the “why” questions. According to Rowley (2006), many different definitions to knowledge can be found and usually it is described as a combination of information and experiences as well as understanding and skills. Tacit and explicit knowledge can also be distinguished from one another. Tacit knowledge refers to the individual side of the knowledge, to the experience of things, beliefs and perspectives (Laudon & Laudon, 2006; Awad & Ghaziri, 2004). Explicit knowledge again refers to the documented knowledge, for

example documents, reports and memos (Laudon & Laudon, 2006; Awad & Ghaziri, 2004). In a simplified way, it can be said that tacit knowledge is the “know how” and the explicit knowledge the “know what” of knowledge (Jashapara, 2005).

Wisdom is the fourth and the highest level of the DIKW Pyramid. It is not very widely discussed and the study material concerning it is still very limited (Rowley, 2006). Jashapara (2005) see that the concept of wisdom is very elusive. It can be seen to have a strong connection to human input, which Rowley (2006: 174) describes as “human intuition, understanding, interpretation and actions”.

A more recent term that has emerged is big data, because the amount of data available has exploded and due to the technological developments it can also be processed and utilised more efficiently. Big data refers to these large sets of data, which is often defined with three different dimensions: volume, variety and velocity (e.g. Minelli et al., 2012; Roberts, 2013). This means large sets of structured, semi-structure and unstructured data, which increases continuously and can be found in different, forms from internal and external sources listed in Table 2.

Table 2: Examples of different data sources

Internal data sources		External data sources
HR data sources	HRIS systems Payroll systems Time tracking software	Social media: blogs, wikis, e-mails, social media platforms (Twitter, Instagram, LinkedIn, Facebook)
Other enterprise systems	ERP systems Financial statements Sales data	Labour market trends External surveys from competitors, customer buying habits Industry benchmark

Internal sources can be either from HR (for example HRIS or payroll) or from other enterprise systems (Roberts, 2013; Fitz-enz, 2010). HRIS can be a standalone system or linked to the wider enterprise systems, which affects the ease of transferring data from one system to another. Multiple HR systems that might not be connected to one another can also be found inside of HR. Different data can be connected to each other through tools like data mart, which is a “software layer on top of independent databases that

gives users access to some or all of the data in each layer” (Roberts, 2013: 3).

External data sources are, for example, labour market trends and external surveys research (Fitz-enz, 2010; Brockbank, 2005) i.e. about the “social, political and economic dynamics on a global scale” (Brockbank, 2015: 298). External data sources nowadays also include growing numbers of data from social media, for example blogs and social media platforms such as Twitter and LinkedIn.

Big data also refers to the gathering, storing, managing, utilising and analysing of this data. When combining data from different sources, it gives more comprehensive information to support the decision-making (Roberts, 2013). It enables the identification of the key causations of different HR inputs and business outcomes. However, as noted already earlier, this combining of data can also complicate the data and decision-making processes and the measurement in the HRM. It can also be quite costly, as making sure that the data from one system is compatible to the other system, and possible the adapting it for that other system may cost a lot.

2.2.2. HR metrics and measuring

The last section examined the data, which forms the basis for the data-driven HRM. Now the focus is directed on how that data can be utilised and how the relevant implications of that data can be identified. In this section, the concept of metrics is defined first, which is then followed by a brief history of the HR measurement. After that, the different types of HR metrics are identified and the debate about universal and customised metrics are presented. This focuses the attention on the key question of what should be measured in the HRM and again connects the discussion to the previous one about the role and perspective of SHRM.

According to Fitz-end & Maddox (2014) there are typically four main reasons for gathering and analysing data, which are (1) describing, (2) explaining, (3) predicting and (4) optimising. Measuring usually starts with the use of simple metrics and reporting, which then can be developed into complex analysis modes. Metrics is an “accountability tool that enables the assessment of a function’s results” (Dulebohn & Johnson, 2013: 73). It indicates how an organisation or smaller unit is performing and

functions as a basis for the decision-making (e.g. Carson & Kavanagh, 2015). Metrics can be presented as percentages, for example; ratios or complex formulas and they can measure particular situation or a trend over time (Fitz-enz, 2010). Metrics can be qualitative or quantitative in nature, but also qualitative data is often presented in quantitative form, through for example employee survey results. The data that is used in the metrics can come from internal or external sources, as already described in the previous chapter.

HR measurement is not a new thing in HRM and the focus of it has changed almost simultaneously with the development of the role of HRM. First, metrics emerged in the 1970s, and measured cost, time and quantity of workforce and HR. In the mid-1980s they expanded to include benchmarking, which made it possible for organisations to compare their results with other companies on various dimensions (Fitz-enz, 2010; Carson & Kavanagh, 2015). However, this kind of comparison is often complex and requires the consideration of different contextual factors, such as different business and talent strategies of organisations. If only the transactional level is measured, for example cost per hire or turnover rates, the results measure only the efficiency but not the effectiveness (Ulrich et al., 2015). All and all, benchmarking can still show trends across industries (Fitz-enz, 2010).

In the mid-1990s, companies increasingly started implementing strategy maps and balanced scorecards, which connected the long-term strategic goals and the short-term operational targets of the whole organisation (Kaplan & Norton 1996; Douthitt & Mondroe, 2013). They included more advanced metrics from different functions and operational processes: financial, customer, internal processes as well as learning and growth. Later on, more HRM focused “HR scorecards” were also developed (Becker et al. 2001). These scorecards typically included key HR deliverables and processes, alignment between these and the business strategy, and the indicators measuring the effectiveness of these deliverables and processes (Douthitt & Mondroe, 2013). HR scorecards generally consist of lagging and leading metrics. Lagging metrics measure the past and the leading metrics the success of achieving the organisation’s strategy. When the amount of HR data has increased and technology has become more advanced, more complex and accurate HR metrics have also been developed. Different kinds of

dashboards are now used to give a direct view to data mart and metrics for the bases of decision-making (Roberts, 2013).

HR metrics are typically divided into three different types that are (1) efficiency metrics, (2) effectiveness metrics and (3) outcome or impact metrics (e.g. Lawler et al., 2004; Boudreau & Ramstad, 2007; Fitz-enz & Mattox, 2014). In addition, Dulebohn & Johnson (2013; 73-74) have added the human capital metrics to the listing of HR metrics that can be seen in Table 3.

Table 3: HR metrics

HR metrics	Examples
Efficiency metrics	Cost per hire HR expense per employee Yield ratios Time to fill the open positions
Human capital metrics	Absent rate Expense factor: operating expense/total full-time equivalent (FTE) Profit per employee: revenue – operating expense/total FTE Labour cost factor: compensation + benefit costs/FTE Human capital value added revenue: operating expenses – compensation + benefit costs/FTE Involuntary and voluntary separation
Effectiveness or cost benefit metrics	Firm salary/competitor salary ratio Number and quality of cross-functional teams Progression of employees through development plans Percentage of total salary at risk
Impact or strategic metrics	Demonstrating a relationship between a particular HR metric and other metrics in the organisation

(Adapted from Dulebohn & Johnson, 2013: 73-74)

The first level, efficiency metrics, measures how well basic administrative HR tasks in an organisation are performed. Typically, this kind of transactional metrics measure productivity and cost. They are operational in nature and aim at maximising the operation of the HR function. These metrics can be evaluated against normative data and compared to other companies (Lawler et al., 2004). All in all, efficiency metrics are usually easy to measure, but offer limited strategic potential for organisations.

The second level is the human capital metrics and they measure the value of the human capital. These kinds of metrics are challenging, because they differ from the other types of capital of organisations as already mentioned before. Human capital is difficult to measure in euros, because no purchase price or market value can be defined. These kinds of metrics can include, for example, labour cost or profit per employee.

The third level of HR metrics is the effectiveness and cost benefit metrics. They measure the value of the HR practices or programmes and distinguish the effective policies and practices from the ineffective ones. Instead of measuring efficiency the focus can be transferred to the effectiveness. One example of this is the training programmes. Instead of measuring the participation in these programmes, the focus is directed on the learning results achieved and new skills developed as a basis of those programmes (Lawler et al., 2004)

The fourth level represents the highest level of the HR metrics. They are the impact or strategic metrics, which measures the HR's effect on organisation, including for example "financial, customer, process, and people outcomes" (Dulebohn & Johnson, 2013: 74). The focus is on combining HR data with other organisational data. The goal is to understand the effect HR practices and policies have on organisational performance and aim at the best use and management of these human capital resources in order to achieve a competitive advantage (Dulebohn & Johnson, 2013).

According to Fitz-enz (2010), everything in business can be measured in 5 ways: cost, time, quantity, quality and human reaction, but the key question then is to know what the most important thing is to measure in different organisations, i.e. what are the metrics that can generate the most value. Many claim that this is a context bound question (e.g. Fitz-enz, 2010; Beatty, 2015). The situation of each organisation is affected by different factors for example the environment, the chosen strategy of the organisation and the business in which it operates. These form the bases for the strategic HR measurement of the organisations, which should be based on customised HR metrics (Beatty, 2015). Roberts (2013: 6) again argues that there is a need for some standards metrics or in other words "standard definitions of the data points that create

these metrics”. If we compare this situation for example to finance we can notice that the same standard metrics and financial statements are used in different companies and across businesses. Center for Talent Reporting (www.centerfortalentreporting.com), which is a consortium of 60 member companies, made a suggestion for the standard set for the HR metrics. In addition, the Saratoga Institute has published annual data of 50 metrics for about 500 companies from the year 1985 (Fitz-end & Mattox, 2014).

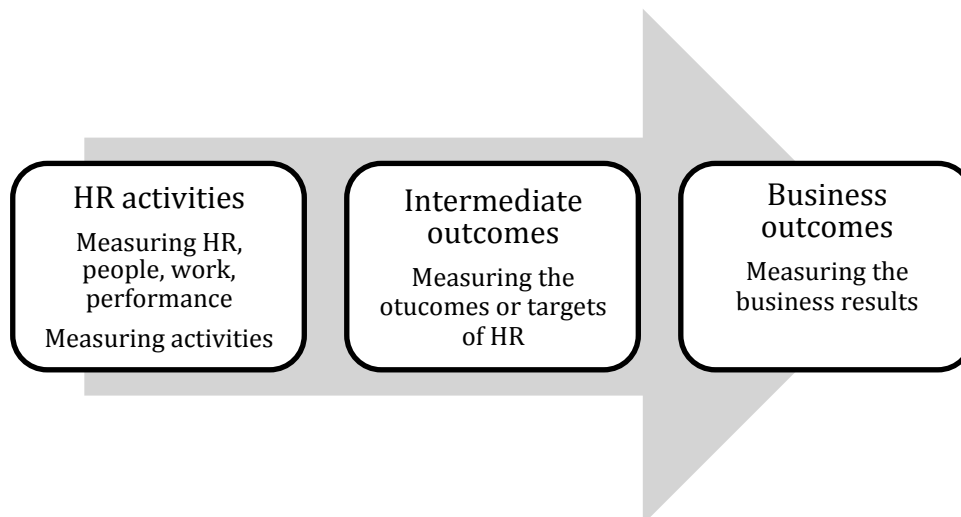
Ulrich & Dulebohn (2015) again emphasise that it is important to understand that the metrics are just a way to measure something and the focus is on that something, not the metrics themselves. Traditionally, HRM has been preoccupied with measuring the efficiency of HR function itself. However, instead of this limited focus on the efficiency and effectiveness of human resources as a function, measurement can be directed at how much value it generates for the overall business. Boudreau & Ramstad (2004) highlighted this problem by comparing HRM again to Finance. Also in Finance, the efficiency and cost of Finance itself are measured. However, the main focus of measuring is not in Finance, but rather in the overall business and how the measuring can support the strategic decision-making and connect Finance to the business outcomes.

Figure 7 illustrates this transition in HRM measuring. Measuring in HRM has usually focused on HR activities, because this kind of measuring has been easy (Ulrich & Dulebohn, 2015). When taking the “next step” in the measuring, organisations begin to measure the intermediate outcomes of HRM. Still, the focus is strongly on HRM itself, but the focus has already shifted to the outcomes and not the activities itself. This transition was illustrated with the example presented previously about the training programmes.

However, HRM as a strategic partner needs to show the connection between the human capital and HR initiatives and the business outcomes. In order to do this, the measuring needs to shift from HRM itself to the larger organisational setting. When adopting the outside-in approach, the starting point for HR measuring is in the business environment and on the customers or other stakeholders’ perspective. Business outcomes can be, for

example, financial (i.e. shareholder value) or customer related (i.e. customer commitment or share). Still, it can be noted that it is not often easy to find a clear line of sight between the HR activities and the business outcomes and, therefore, measuring the intermediate outcomes of the HR work is also important (Ulrich & Dulebohn, 2015). This refers to individual abilities for example talent and performance as well as organisational capabilities, which are for example organisational culture and quality of leadership. When the correlations and causations between the HR activities, intermediate outcomes and business outcomes can be shown, HRM work will have the possibility to deliver more strategic value.

Figure 7. HR metrics levels



(Adapted from Ulrich & Dulebohn, 2015: 203)

2.2.3. Decision-making in HRM

In the previous sections, the data and the metrics related to data-driven HRM were introduced. However, in order to transform data and metrics into meaningful insights and as a way to enable strategic decision-making in HRM, additional focus needs to be directed on the decision-making processes of HRM. As a basis for this examination, the focus is first directed on the academic literature concerning the theoretical foundation of SHRM. The practical level of HRM decision-making can be better understood after forming an overview of the different ways that SHRM is perceived to contribute to organisational performance.

The theoretical approaches to SHRM can be divided into three major approaches as listed in Table 4 (Delery & Doty, 1996). These are universalistic, contingency and configurational perspectives. The universal approach to SHRM aims at identifying the best practices for SHRM. This approach argues that some practices are always better than others and in this way universal (Delery & Doty, 1996). Contingency perspective again emphasises the fact that HRM practices need to be consistent with the strategy of organisation. Because of the unique situations of different organisations, HRM needs to fit the context. Hence, HRM strategy should vary and be developed based on the contextual factors (e.g. Baron & Kreps, 1999; Beer et al., 1984). Configurational perspective combines horizontal and vertical fit where “bundles” of HRM practices for unique patterns are based on the context (Alcázar et al., 2005).

Table 4: Theoretical perspective of SHRM

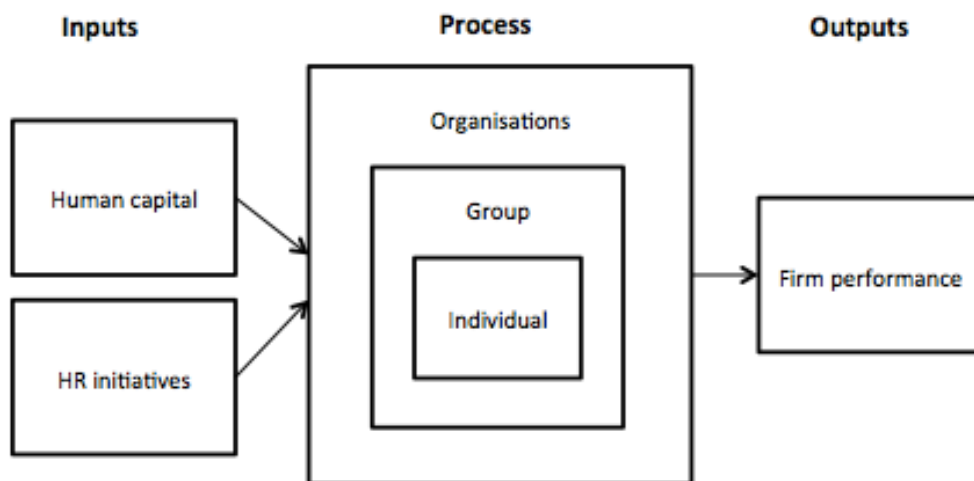
Perspective	Description
Universalistic perspective	“Best practices” approach to SHRM (universal HRM practices optimal) Relationship between different variables are universal across different organisations
Contingency perspective	“Best fit” approach to SHRM (HRM practices must be consistent with the strategy) Relationship between the different variables differ at different levels
Configurational perspective	“Unique bundles of HR practices” approach to SHRM (HR systems that achieve both horizontal and vertical fit)

(Delery & Doty, 1996)

The perspectives on SHRM presented above are complemented with the resource-based view (RBV), which emphasises the internal resources of organisation as a possible source of competitive advantage (Barney, 1991; Buller & McEvoy, 2012). If the organisation possesses human resources that are “valuable, rare, non-imitable, non-substitutable”, it can achieve a competitive advantage. Originally, the theory did not describe in more detail how the critical resources can be developed and it has been complemented later on with different perception of these. Often, the human capital (knowledge, skills and abilities of employees) and the social capital (interaction

between people) are seen as the possible sources of competitive advantage and that the HR practices should be managed in a way that build up these capitals in organisations (Buller & McEvoy, 2012: 45). Still, as mentioned previously, the connection between the HR initiatives and organisational performance is not clear, which has resulted in the fact that it is often called the “black box” of HRM as illustrated in Figure 8 (e.g. Boudreau & Ramstad, 2007; Boselie et al., 2005; Walsh, 2010; Jackson et al., 2014). The fundamental question is how the mix of HR investments and initiatives that develops the human and social capital and possibly the competitive advantage is reflected in the firm’s performance (e.g. Walsh et al., 2010).

Figure 8. The black box of HRM



(Adapted from Walsh et al., 2010)

The black box of HRM has been profoundly studied, but no decisive conclusions have been made as yet (e.g. Huselid & Becker, 1995; Boudreau & Ramstad, 1997). It, however, has been argued that if the valuable, rare and non-imitable HR capabilities want to be achieved, the key factor is not on launching single HR programmes, but instead on how they are bundled together (Barney & Wright, 1998; Lepak & Snell, 2002; Walsh et al., 2010). Hence, the focus then would be on “bundling them together for different groups of employees in coherent, strategic ways” (Walsh et al., 2010: 10). Then, employees cannot be treated as just one group, but the HR initiatives should be customised on the strategic needs of different employees. It has also been argued that maybe the focus should not be on the employee performance, but instead on the

business outcomes (Walsh et al., 2010). Hence, the HR programmes would be measured and evaluated directly on the basis of how they influence the customer outcomes and the focus would be on “meeting the customers’ need instead of the employees’ need (Walsh et al., 2010: 11).

The decision-making processes of HRM are not only affected by the theoretical foundation of how HR practices and investments are comprehended to influence the business performance. In order to form a more complete overview of this theoretical foundation for SHRM, the focus also needs to be directed on the roles of HR because they have a major effect on how HR as a function and HR as professionals are able to make decisions and influence the way HR is managed in organisations. Guest and King (2004) have examined these issues on the basis of Karen Legge’s (1978) work. They argue that the analysis of Legge (1978) about the challenges influencing the role of HR is still relevant today.

The original finding that Legge (1978) made, was that the HR professionals (or then called personnel managers) are in challenging situations in organisation, because of the work they do is not solely done by them. This means that the line managers as well as the upper management need to participate in the management of people. However, this was not a role that they were willing to accept. This leads to situations where HR professionals need to manage something that is hard to manage and control, which often leads to multiple difficulties. For example, uncertainty about the outcomes of HR investments more often leads to a negative decision than in other functions. These factors will lead to a lack of power and ability to influence the decisions and to a more reactive role.

Legge’s (1978) solutions to this were power and authority i.e. a conformist innovator and radical innovator. A conformist innovator is a person who accepts the role that is “given to him/her”, accepts the dominant organisational values and goals and focuses on the administrative efficiency. However, this will often lead to increased bureaucracy and stiffness. A deviant innovator again tries to make change by “gaining acceptance for different set of criteria” (Guest & King, 403). Many HR professionals have

experienced this as very difficult, to which Legge (1978) concluded that HR professionals need to become “problem solvers” who should become strongly grounded in social science knowledge and skills and contingency theory. However, as Guest and King (2004) conclude on the basis on their studies, HR professionals still are not eager to take the role of a deviant innovator or problem solver, which in practice means that HR professionals are in many cases the silent bystanders when the strategic decisions about HR are being made or are left unmade.

Next, the decision-making processes of HRM are examined in the practical level in two different sections. First, the different decision support systems are described, which due to the technological development have become more sophisticated tools for supporting HRM decision-making. After this, the decision-making processes of HRM are described in more detail with the perspective of Dulebohn and Johnson’s (2013) framework.

2.2.3.1 Decision support systems

As stated earlier, when examining the decision-making processes of HRM, the focus needs to also be directed at the electronic decision support systems that due to the technological development will influence the way the HRM decisions are made in the future. These tools are called decision support systems (DSS) or the business intelligence (BI) and they include metrics and analytical tools that can be used as a part of HRIS to help in the decision-making processes (Dulebohn & Johnson, 2013). Therefore, many argue that these are very similar and in some way overlapping tools (e.g. Bhargava et al., 2007; Negash, 2004) as others claim that BI tools are a subset of DSS tools (e.g. Power, 2002).

Although these DSS tools are widely used, very limited research can be found in the HRM context. Dulebohn & Johnson (2013) argue that one reason for this is the fact that there is not a single DSS version that can be implemented in HRM. This means that DSS tools need to be designed based on the demands of an organisation. Despite of the limited research on DSS tools in HRM, other research on the general DSS tools can be found (Dulebohn & Johnson, 2013). On the basis of the studies, different types of DSS tools are listed in Table 5.

Table 5. DSS Framework classification

Researchers	DSS framework
Donovan & Madnick (1977)	DSS for on-going, programmed decisions DSS for ad-hoc, non-programmed decisions
Hacakhorn & Keen (1981)	DSS for individual decisions DSS for group decisions
Alter (1977)	Data-oriented DSS (focus on the data) Model-oriented DSS (focus on mathematical models)
Power (2002)	Knowledge-driven DSS (focus on algorithms and human expertise) Document-driven DSS (focus on organising, classifying and managing documents) Communication based DSS (focus on collaboration of the decisions) Inter-organisational DSS (focus on spanning the organisation in the decision-making) Web-based DSS

(Adapted from Dulebohn & Johnson, 2013: 73)

Different types of DSS tools are used in a different context. They typically focus either on the function (or goals) or the technology of the DSS and that more supporting framework for the decision-making of HRM is still needed (Dulebohn & Johnson, 2013). The role of DSS tools is more closely viewed in the following section where it is examined as part of the decision-making framework of Dulebohn and Johnson (2013).

2.2.3.2 Framework for HRM decision-making

In this section, the decision-making processes are examined on the practical level. Before examining the framework more closely, it needs to be taken into account that the decision-making of HRM is a complex process, which is affected by the role, management and practices of HRM in different organisations. Still, Dulebohn & Johnson (2013) have made on the framework for HR decision-making in order to describe the different decision-making levels and targets related to HRM. The framework illustrated in Figure 9 is adapted from the Gorry-Scott Morton grid (Gorry & Morton, 1971), which is based on the Anthony's (1965) management levels and Simons (1960) classification of decision structure.

The original Gorry-Scott Morton grid (Gorry & Morton, 1971) was based on decisions along two dimensions that were the management decision-making levels and the degree of the problem structure. The decision-making role can be divided by management activity into operational control, management control and strategic planning as listed in Table 6 (Anthony, 1965). Depending on the level, a different kind of data, metrics and processes are needed in order to achieve the best outcomes.

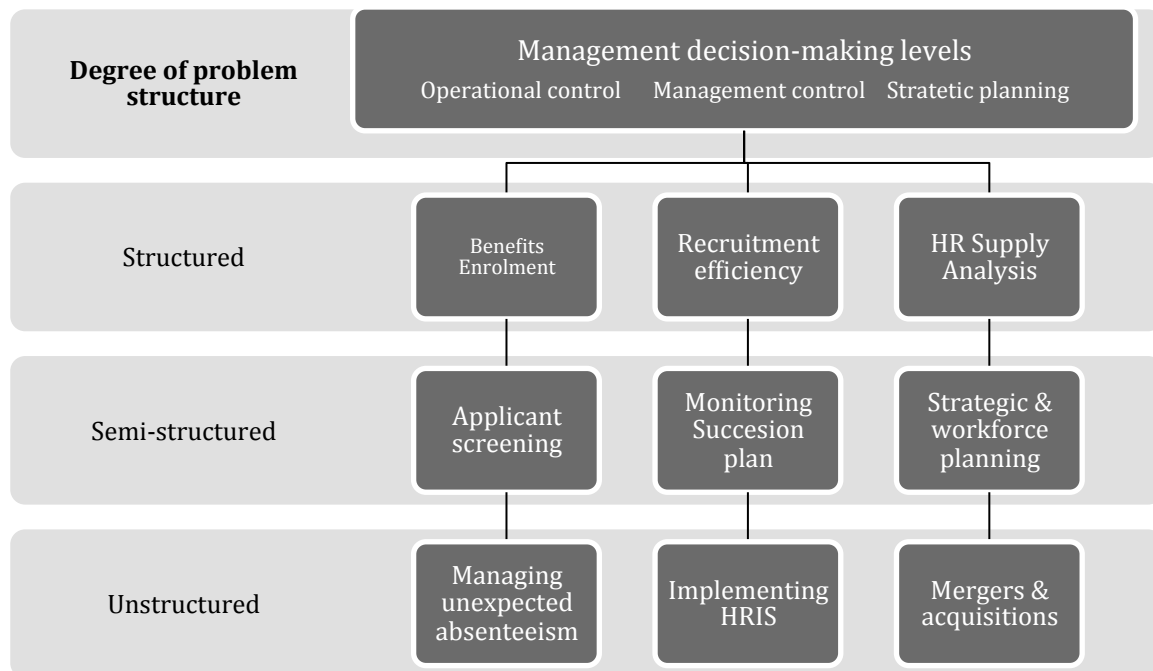
Table 6. The decision-making levels

Operational control	<ul style="list-style-type: none"> -Day-to-day task that need to be done efficiently and effectively -Decision-making is limited, because the focus on mainly on executing tasks that the management level monitors -HR focuses on the efficiency of the management and the use of human resources
Management control	<ul style="list-style-type: none"> -Continuous decisions made by managers -No strategic decisions but the decisions need to be based on the strategic choices already made -Often decision that relates to the implementation of the strategy and monitoring and evaluating the results of it -Decisions are usually made by large number of people
Strategic planning	<ul style="list-style-type: none"> -Focus on the objectives and strategic goals -Externally and future oriented -Decisions complex, non-routine and changing as well as evolving in their nature -The decisions are usually made by a small group of people <p>The role of HRM is informing and assisting with the decisions that are typically made by the management board</p>

(Adapted from Gorry & Morton, 1971)

Another dimension of the framework is the decision problems, which are categorised as structured, semi-structured and unstructured (Simon, 1960). A structured decision can be solved with mathematical models and statistical tools, but unstructured decision cannot be based on standard solutions and need human judgment. Semi-structured decisions again are somewhere in-between these two and also usually need both types of solutions to be resolved.

Figure 9. Decision-making framework for HRM



(Adapted from Dulebohn & Johnson, 2013: 75)

The framework of Dulebohn & Johnson (2013: 75) distinguishes between nine different decision-making situations that are seen in Figure 9. The structured operational HR control activities refer to the administrative tasks, which can be automated through HRIS. The semi-structured operational HR controls activities again in situations that can be partially automated, but still needs some level of human judgment. The last operational HR control activities are the unstructured ones. These are usually rare and unanticipated and cannot be automated through HRIS. HRIS can offer data for the decision-making and DSS tools can be used, but the decision still needs to be based on human judgement.

The next decision-making level is the structured management control. This is the level where line managers ensure that decisions are made based on the HR strategies and carried out efficiently and effectively. This can be done with the HRIS and measured through efficiency metrics. Semi-structured management control is again a combination of structured and unstructured decision-making. In these situations, HRIS, efficiency and effectiveness metrics are used as well as data from multiple sources. DSS tools can also support the decision-making process, although human judgement is also needed.

Unstructured management control decisions are “unanticipated, complex and unprogrammed” (Dulebohn & Johnson, 2015: 79). DSS tools can assist these processes, but, due to the rare and complex situations, the role of human judgment is substantial.

The last level of decision-making is the strategic planning. It is the highest level and the role of HRM can vary from no role to full partnership-role, which was described already earlier by Lawler & Mohrman (2003). Structured strategic planning is the stage that can be based on the HRIS and the DSS and BI tools can be used to support this decision-making process. This means utilising different algorithmic techniques and analytic tools. In the semi-structured strategic planning, the role of DSS and BI is to combine data from different sources to carry out complex analysis and to support the decision-making processes. The last phase, unstructured strategic planning is the non-routine decisions that need to be based mostly on the human judgment and intuition. The decision-making process requires a strong emphasis of human judgement, but DSS and BI tools can support these processes.

As it can be noted from the previous framework that use of data and metrics do not automatically mean good decisions. Systematic “fact-based decision-making process is a combination of commitment, critical thinking and rational thought” (Smith, 2010: 42). The key question is then what types and levels of metrics, tools and human judgment should be used in different levels of decision-making processes of HRM. In the more “simple” decisions, more simple metrics and tools will also probably work best, but when moving towards a more strategic decision, more complex and sophisticated metrics and tools are needed. Still, the same also applies to human involvement. If the decisions to be made are a basic, standard decision, they are usually easy to make. However, when addressing the more complicated decision-making situations, in addition to the more complex tools and metrics, more human judgement is also needed.

2.4. HR analytics

In this chapter, the focus is on the concept of HR analytics. At first, the evolution of HR analytics and its connection to the data-driven HRM is described. After that, the focus is directed on the different levels and processes of HR analytics, which is followed by a

description of how HR analytics is currently utilised in HRM. Then, the HR analytic departments and the people who work with HR analytics are defined and described in more detail and finally this section is ended with the possibilities and challenges concerning HR analytics.

2.4.1. The evolution and definition of HR analytics

Jac Fitz-enz first introduced the idea that HR activities and their impact should be measured in 1978 (Bassi, 2011). Although this received very contradictory reception at first, now decades later it can be observed that the measurement tools and processes of HRM have gone through a significant evolution over time as already disclosed in more detail in the previous chapter. During the past decade this evolution has accelerated even further with the help of technological developments. The rapid development of various software programs has opened up new possibilities for combining the increasing amount of data from multiple sources and analysing it more efficiently than before. The overall roots of the wider business analytics can be seen to be in the DSS tools. These tools emerged gradually in the 1960s and 1970s, which were followed by the decision support applications like executive information systems (EIS) and online analytical processing (OLAP) (Watson, 2011). In the 1980s and 1990s, came the data warehousing (DW) and business intelligence (BI) tools (Watson, 2011) and nowadays the word “analytics” is often used as a hypernym for all these previous tools (Watson, 2011).

When focusing more on the actual HR analytics,

it can be defined as a communication tool that combines data from different sources to describe the current situation and to predict the future (Fitz-enz, 2010).

Still, multiple definitions for the term can be found varying from the HR metrics and reporting to more complicated predictive modelling (Bassi, 2011). Bassi (2011) notes that maybe HR analytics should be seen to include these different aspects instead of limiting it to a more narrow definition. According to her as well as many other researchers, the HR analytics is an evidence-based approach to better decision-making, which utilises different methods. However, it should be noted in this context that Bassi

(2011) referred more to the fact-based decision-making i.e. data-driven approach instead of the scientific approach already described in the previous chapter.

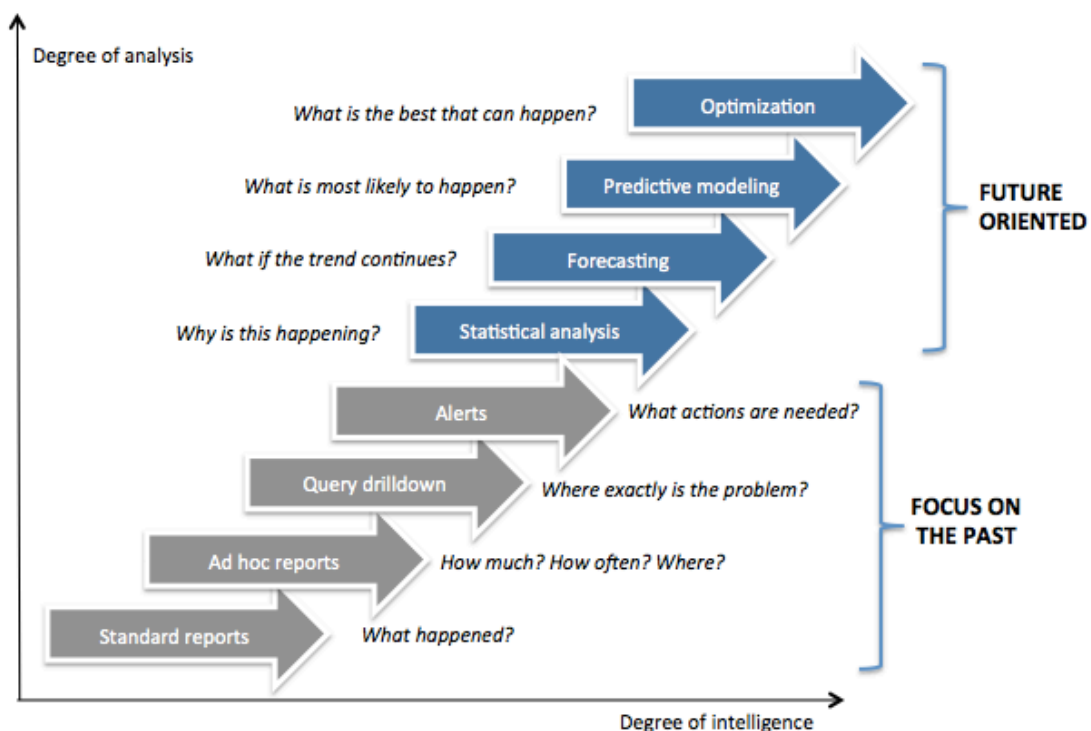
According to Fitz-enz (2010: 4), “analytics is a mental framework, a logical progression first and a set of statistical tools second”. By this he means that in the centre of analytics is the way people see the world and try to make sense of it and the tools are a way to make this happen in practice. It begins with the understanding of the issue at hand and after that statistics are used if necessary to understand and uncover the hidden value from the masses of data (Fitz-enz & Mattox, 2014). The most crucial thing then according to Levenson (2013) is not just to collect data, but also to know what to do with it. In this way, the value of HR analytics comes from the knowledge of things that matter, and what matters is context bound according to Fitz-enz (2010). It can be seen to depend on the situation, organisation and its business goals so in this way its focus is on business, not just HRM. In practice, the utilisation of analytical tools often begins with the tools and data instead of the desirable business outcomes (Rasmussen & Ulrich, 2015). Therefore, instead of just adopting new methods, adopting a new kind of attitude and aspect for HRM is also needed in order to change and develop their role in organisations. This aspect supports the views, which Ulrich and Dulebohn (2015) and Boudreau and Ramstad (2007) described already in the previous chapters when talking about the overall developing role of SHRM. The reason why HR analytics is still typically often applied for example to study turnover or attrition is because this kind of data is often easily available in the HR database and is relatively easily analysed (Fitz-enz & Mattox, 2014).

All in all, in the academic literature HR analytics is described to be still in its infancy and rarely utilises external data in HRM decisions (e.g. Pape, 2016). Gale (2015) complemented this by stating that the analytics that are used are usually visualisation tools, which help to organise the data instead of supporting future decision-making. Ultimately, the empirical research on the HR analytics is still very limited and more research is still needed (Heuvel & Bondarouk, 2016).

2.4.2. The levels of HR analytics

In practice, HR analytics usually starts with the use of simple metrics and reporting, which can then be developed into more complex descriptive analysis models. Using the simple metrics and reporting is easy, but the degree of intelligence increases when moving towards more complex analytical models. These different levels are described in more detail in Figure 10.

Figure 10. Degrees of analysis and intelligence



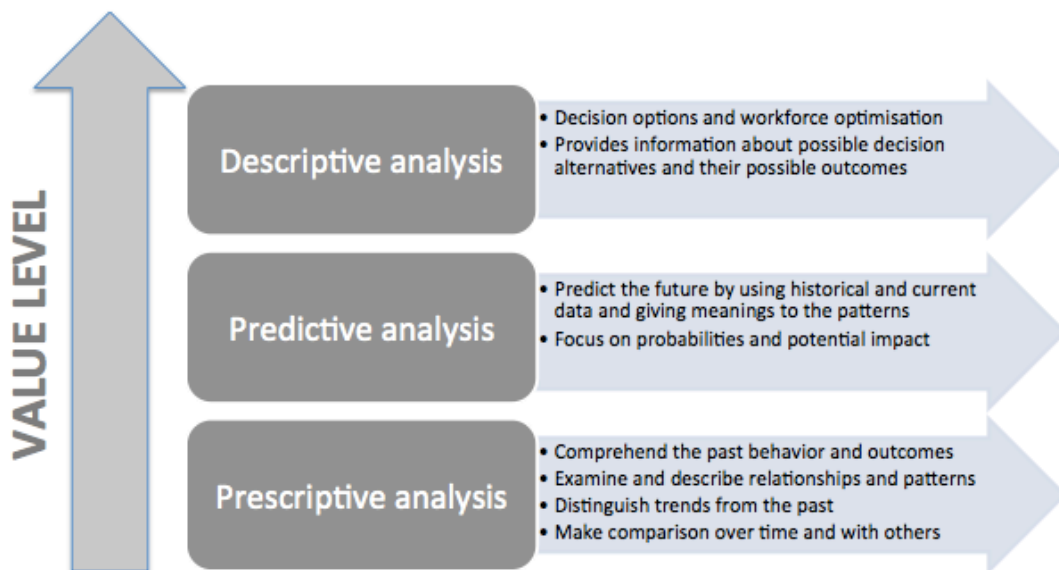
(Adapted from Fitz-enz, 2010; Davenport & Harris, 2007)

The first levels usually focus on improving organisations' current processes by basic collecting and organising of data. This is often easy, but as the amount of data and the number of possible data sources increases the data collecting and reporting also become more difficult. Often some kinds of dashboards are used to do this, which can report different information for example the degrees of performance. It shows the current situation, but does not predict the future. When measuring and learning to understand the current way of doing things, value can be added by improving their efficiency. Slightly more advanced reporting often links these processes to the organisational goals,

which according to Fitz-end (2010) can be measured with “QIPS”. By this, he refers to the “quality”, “innovation”, “productivity” and “service” aspects of business. With these, the typical and general objectives of organisation can be measured, which are usually set by the top management. By this way, adding value can be demonstrated more concretely and the results of organisation can also be compared to others i.e. benchmarking. In order to do this, the data from other organisations needs to be collected to do the comparison and in this way the accuracy and utility of the results greatly depend on the quality of the data collected (Fitz-enz & Mattox, 2014).

The four upper levels again are future oriented, which analyses why something is happening and is it likely to continue. These levels also include different predictive modelling as well as optimisation. Generally, these analytical tools can be classified into different types, which are presented in Figure 11.

Figure 11. Different types of HR analytics



(e.g. Fitz-end & Mattox, 2014)

The first type is the descriptive analysis (Fitz-enz, 2010) in which the aim is to comprehend the past behaviour and outcomes and to examine and describe the relationships and patterns (Ulrich & Dulebohn, 2015). It also enables distinguishing the trends from the past and makes comparisons over time or with others. The focus in this level is usually on cost reduction and process improvement (Fitz-end & Mattox, 2014).

Examples of descriptive analysis are dashboards and scorecards, data visualisation, OLAP reports, periodic reports and basic data mining (Fitz-end & Mattox, 2014).

Second type of analysis is the predictive analysis, which tries to predict the future by using historical and current data. The focus is on the probabilities and potential impact (Fitz-end & Mattox, 2014). According to Fitz-end (2010: 10-11), predicting the future depends on four things, which are (1) understanding the past and current events, (2) trends and drivers behind them, (3) ability to see patterns of consistency but also change and (4) having the right tools to predict the probability of something in the future. By using the data and the descriptions made from the past trends and patterns, the analytics tries to predict the future by giving meanings to the patterns (Fitz-end & Mattox, 2014). This can be done by different techniques, for example statistics, modelling and data mining. Examples of predictive analysis are decision trees, CART, genetic algorithms and neural networks (Watson, 2011).

The third type of analytics is the prescriptive analysis, which is about decision options and workforce optimisation (Fitz-end & Mattox, 2014). It analyses complex data, provides information about the possible decision alternatives and their possible outcomes. One example of prescriptive analysis could be the attrition model, which describes the likelihood of employee resignation. Examples of prescriptive analysis are mathematical programming and simulation (Watson, 2011).

The different steps and types of analytics described above can be viewed in relation to the value adding. In the lower level, the process and collecting and interpretation of data are easier than in the upper level, but also relative value increases when proceeding from level to level. The measured value can be described with financial or economic value (Fitz-end & Mattox, 2014). Financial value refers, for example, to cash or increased share value. Economic value again refers to non-financial matters, for example market reputation, customer satisfaction or valued place to work.

Davenport et al. (2010: 54) have identified six main ways that HR analytics are currently used in practice. These are distinguished/vary in terms of sophistication: (1) human capital facts (the selecting and monitoring key indicators of human capital), (2) analytical HR (identifying what units or individuals in the organisations need most

attention), (3) human-capital investment analysis (what actions can have the greatest impact on the business), (4) workforce forecasts (knowing when to staff up or cut back), (5) talent value model (to know why employees leave or stay) and (6) talent supply chain (how to adapt business environment changes to the employees). Some key examples of these different types of HR analytics are listed in Table 7.

Table 7: Examples of analytics utilisation

Types of HR analytics	Examples from organisations
Basic human-capital facts	JetBlue: Crewmember net promoter score to analyse engagement and predict financial performance (Davenport et al., 2010).
Analytical HR	Massachusetts Institute of Technology: Uses electronic “badges” for employees to track their interactions with co-workers in order to identify factors of successful teams and leaders (Castellano, 2014)
Human-capital investment analysis	Sysco: tracking the satisfaction levels of delivery associates to improve their retention rate (Davenport et al., 2010). Google: analysing attributes of great managers (Castellano, 2014)
Workforce forecasts	Dow Chemical: predicts future headcounts on the basis of industry trends and make “what if” scenarios (Davenport et al., 2010).
Talent value model	Google: Analysing factors leading to attrition (Davenport et al., 2010). IBM: predicting employee’s propensity to leave (Gherson, 2015)
Talent supply chain	Retail companies: predict incoming call-centre volume in order to manage its employee capacity (Davenport et al., 2010). Superior Energy Services: strategic workforce analysis when considering opening operations in new locations (Roberts, 2013)

(Adapted from Davenport et al., 2010)

Davenport et al. (2010) also noted that almost every organisation they studied emphasised employee engagement, but only a few of the organisations were assessing this with specific measures and in terms of money/cost. Most of the organisation

focused on academic records when recruiting but only few organisations used more complex analysis to predict high performance on the job. These examples might indicate the fact that many organisations are still using traditional ways of measuring HRM, but also some exceptions can be found that are linking it to more specific and customised measuring. It should also be noted that this is likely to greatly depend on company size, and the size of investment in technology. Many SMEs are still using Excel sheets for basic analytics and either lack HR software altogether or at least its analytic modules.

2.4.3. The processes of HR analytics

When examining the processes of HR analytics more closely, it can be noted, based on the previous discussions in this chapter, that the actual analytical tools are only a small fraction of the overall analytics process. In the academic literature, there are multiple key point listings of how to implement and how to not to implement HR analytics, which include more or less the same kind of issues (e.g. Davenport et al., 2010; Mondore et al., 2011; Levenson; 2013; Rasmussen & Ulrich, 2015). Davenport et al. (2010) argue that mastering HR analytics is based on the same fundamentals as the wider business analytics. They have listed the key points in “The Acronym Delta” that can be seen in Table 8. It consists of five factors, which are (1) high-quality data, (2) enterprise orientation, (3) analytical leadership, (4) strategic targets and (5) the analysts (Davenport et al., 2010: 57). These are described in more detail in Table 8. According to Davenport et al. (2010), when mastering HR analytics, good management is always a crucial factor. If executives do not believe that human-capital insights have the possibility to foster value for the overall business, it probably will not lead to optimal results. In addition to this, there needs to be enterprise orientation and understanding of what will generate the most value to the business and how the analytical theory can be converted into practice.

Table 8. Five factors of the Acronym Delta

High-quality data	-Needs to be sufficient enough to function as a basis for the analytics
Enterprise orientation	-No data silos, all organisational data needs to be

	accessed in order to achieve broader perspective and results that contribute to the overall business
Analytical leadership	-Committed management, who understand the possibilities of HR analytics and the role of SHRM -Management that promotes experimental culture, which enables learning.
Strategic targets	-What are the main focus points of analytics -What are the key components that generate the most value to the organisations
Analysts	-How can the analytical theory be converted into practice? -Analytics is just the first part and the second is to turn it into practical actions by data-driven decision-making.

(Davenport et al., 2010)

In addition to understanding the fundamentals of HR analytics, there needs to be an understanding of the actual process related to HR analytics. Still, a relatively limited amount of research can be found on the actual processes of HR analytics. Fitz-enz (2010), who has studied the HR analytics for years now, has formed a framework for HR analytics on the basis of his studies. This framework is called the Human Capital Management framework for the twenty-first century (HCM:21), which is a framework for predicting management and decision-making that collects, organises and analyses data for assessing and predicting the future. The model is illustrated in Figure 12 and it consists of four main phases, which are (1) scanning, (2) planning, (3) producing and (4) predicting (Fitz-enz, 2010: 302).

The first phase of the HCM:21 is the strategic scan, where the external and internal factors and business goals are compared to internal and external labour pools. The three fundamental capitals that are taken into focus here are human capital, structural capital and relational capital, which are defined in more detail in Table 9. All of these capitals in the organisation influence each other but are often still dealt with in silos.

Table 9. Fundamental capitals

Human capital	Employees
Structural capital	All of the property that the organisation owns for example equipment, software programmes and patents

Relational capital

The knowledge and social contacts between the people in the organisation and between the people in the organisation and external stakeholders.

(Fitz-enz, 2010)

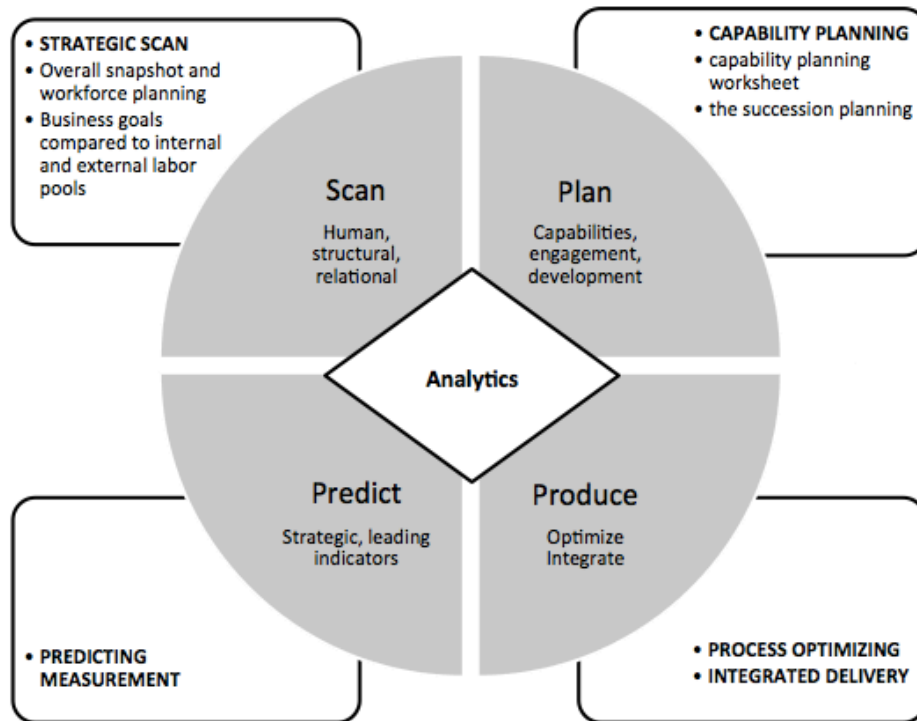
The scanning done in the first phase offers a foundation for the next phase, which is the capability planning. The first step of this phase is the capability planning worksheet which is done by dividing the workforce into “mission critical” (essential to survive), “unique” (market differentiators), “important” (operational necessities) and “movable” (outsource or eliminate)” (Fitz-enz, 2010: 315). After this is succession planning, which consists of recognising employees with greatest potential, planning development programmes for them, monitoring the results, and ensuring that plans are aligned with the strategy and key performance indicators (KPIs).

The third phase is the producing, which consists of process optimising and integrated delivery. In this phase, the different HR services are examined as processes and process optimisation aims at increasing the efficiency and effectiveness of these different processes for example hiring or retention. Statistical analysis can be utilised in order to find the most cost-effective choices. Integrated delivery again helps to identify the company level objectives and the key goals of different functions or departments.

The fourth phase of the model is the predicting measurement, which includes the strategic, operational and leading indicators. The goal is to use analytics to identify different correlations and causal aspects in order to form a comprehensive overview of the current situation. Special focus is directed on leading indicators, which predict the future events.

The last phase of the model is the analytics. According to Fitz-enz (2010) HR analytics helps to identify connections between or inside the different factors seen in Figure 12. and described in the previous. The alignment and integration of the different phases and factors of the HCM:21 model enable more profound analytics, which can be identified with different analytics and algorithms.

Figure 12. HCM:21 model



(Adapted from Fitz-enz, 2010: 302)

HCM:21 framework illustrates the fact of how HR analytics is used as a tool in different planning, managing and decision-making situations. It can be utilised when needed, but still the overall focus is on the strategic business context. Analytical tools HCM:21 also describes well the different situations that HR analytics can be used. Because of the different situations, the tools or metrics that are used are also different depending on the context.

2.4.4. People and teams behind HR analytics

There are different ways in which organisations can organise their HR analytics departments, using either internal or external analytic experts (Levenson, 2005). External analytics can have deep understanding about specific areas, but not necessarily of the wider area of HRM and the organisational context factors. Internal analytic experts from other business function again can have a specific understanding of organisational factors, for example product-lines, but not have a deeper understanding

of HRM. In practice, organisations can either use third-party tools offered by vendors, use consultants or do the HR analytics in-house (Naasz, 2015). If it is done in the organisation, it can be organised as a part of an HR team or as an own department.

Levenson (2005) argue that due to the challenges related to external and internal experts outside HR, HR needs to build these capabilities inside the HR department. He proposes an HR analytics centre of expertise (HR-ACE) as well as developing the analytical capabilities of other HR professionals (Levenson, 2005: 30). The Center for Effective Organizations (CEO) is currently examining these novel HR-ACEs in practice on the basis of which Levenson (2015) has concluded a few insights. One is that HR-ACE needs to have a clear focus and daring to limit to the few high-priority analyses. They also need to utilise some external resources from the academic and consulting areas, in addition to the internal ones. In addition to this, as Levenson (2005) stated, the other HR professionals also need to develop their capabilities about HR analytics. He noted that they need the basics of data based analysis, but not as deep an understanding as in the HR-ACEs. However, it has been stated that one obstacle or at least speed bump in the development of HR analytics has been the capabilities of HR professionals (Gale, 2015). Gale (2015) notes that, in addition to that, the HR teams are lacking the analytics skills, and they also lack the partnership with the other departments in order to share the data needed for the analytics.

According to Rasmussen & Ulrich (2015) when HR analytics matures, the cooperation with the other teams increases. They again see that HR analytics will be a part of cross “functional/end-to-end analytics” in which HRM is one element in the entire value chain (Rasmussen & Ulrich, 2015: 3). All in all, Rasmussen & Ulrich (2015: 3) see that the future will lead to “cross-functional/line of business “enterprise” platforms” in which different functions of business will operate on joint platforms and systems. Mondroe et al. (2011) support this view, and argue that the best results concerning HR analytics would come from cross-functional data teams. This is because the data utilised comes from multiple sources, not just HRM. According to Mondroe et al. (2011: 23), the team should consist of “measurement experts, key line-of-business leaders or metric owners and HR leadership”. In this way, the team would include experts from different areas from analytics experts to HR professionals and decision-makers of organisation.

Watson (2015) points out that there is a shortage of analytics professionals nowadays. Analysts need to have a variety of skills. They need to be able to work with a large amount of data and datasets, comprehend different analytics tools, master knowledge as well as communication skills (Watson, 2015: 36). These people are not necessarily very easy to find.

As Levenson (2015) already pointed out, Ulrich and Dulebohn (2015) conclude that HR professionals need to improve their competencies in order to be able to utilise HR analytics as part of the decision-making processes. Still, Ulrich and Dulebohn (2015) state that they have noted in their studies that many HR professionals have chosen their careers on the basis that they do not need to work with the quantitative side of business. Ulrich et al. (2013) have studied the competencies of HR professional since 1987 in research conducted every six years. In their studies they have identified the key competencies of HR professionals that have the strongest effect on business performance. They concluded that in the future mastering technology and information, as well as HR analytics, are key skills for the HR professionals. Ulrich & Dulebohn (2015), however, propose that the ownership of HR analytics should be kept with the line managers. Then, the HR professionals' role would be to make the blueprints to action and present the possible choices to line managers. In order to get the line managers to commit to the HR analytics, they should also be involved in the planning.

2.4.5. Challenges of HR analytics

Because of the novel area of HR analytics and the still very limited amount of academic research, it is likely that there still can be found many challenges that have not yet been identified. The challenges that have been recognised are classified in five different types and are listed in Table 10.

The first type of challenge is the data related ones. Many have been concerned with the challenge of too much data and metrics. If organisations try to measure everything, know everything and control everything, the task in hand might be too extensive and as a result nothing gets measured properly (e.g. Cravino, 2010). Another type of challenge is related to the data silos. If data from different internal and external sources cannot be

integrated, a comprehensive picture of the overall situation of the organisation is difficult to form.

Table 10: Challenges of HR analytics

Types of challenges	Challenges
Data related challenges	Too much data and indicators Data with silos
Process challenges	Addressed as a replacement of human thinking Focus on the measuring and tools rather than the results Relying only on few metrics or the “wrong” metrics Past is not a guarantee of the future HR professionals do not master the data-driven storytelling Ignoring aspects that cannot be turned into quantitative measurement
People related challenges	Analytics functions as excuse to treat employees as pure resources
Managerial challenges	Trust in the highest-paid person’s opinion and intuition Organisational culture and/or management do not support the analytical culture or its development
Ethical and privacy related challenges	Not been able to protect the sensitive employee information Organisations might be exposed to discrimination lawsuits when collecting and utilising data of employees Is it ethical to collect a wide range of data on the employees?

The second type of challenge is the HR analytics process related ones. HR analytics is not only about collecting data, but also knowing how to use it (Castellano, 2014). If too many metrics are used, the result might only lead to a significant number of reports that no one is reading. This way the focus easily starts to disappear. Rasmussen & Ulrich (2015) argue that it is balancing between looking outside and knowing the inside, but also understanding what the measurements and parameters mean. They are context-bound and parameters are just a piece of overall information. Rasmussen & Ulrich (2015) conclude that parameters serve as a reference point, which begin the reflection process. Data and analytics do not often lead straightforwardly to actions (Rasmussen & Ulrich, 2015; Levenson, 2105). HR analytics is still sometimes seen as replacement for all human thinking. According to Castellano (2014), it is more a balancing between the human judgment and analytics. Qualitative information, for example observations and

interviews, is needed in addition to the hard data. All in all, it is important to understand that everything cannot be measured and everything that is measured cannot be managed. Equally important is understanding that when predicting the future, the past is not always a guarantee of the future. Welbourne (2015) conclude that also the way that the data is presented has a major effect on the decision-making processes. She describes this as the data-driven storytelling, in which the focus is directed also to the presentation of the data analytics, not just the analytics itself. By this she means that in addition to understanding the world of analytics, HR professionals should also learn to transform this information into insights and present it in a way that will gather the attention of the board. In addition to this, special focus should be directed.

The third type of challenge is the people related challenges. Analytics might offer a good excuse to treat employees as pure resources and special attention should be paid to the “human side” of human resources (Davenport et al., 2010).

The fourth types of challenges are the managerial challenges. McAfee & Brynjolfsson (2012: 65) have raised this question with the term “HIPPO”. By this they mean that the decision-making processes of organisations often rely heavily on the “highest-paid person’s opinion” and their intuition. Hence it is important that organisations critically evaluate their decision-making processes in order to avoid this. McAfee & Brynjolfsson (2012: 68) also note that this places demands on the entire organisational culture. Instead of asking the question “what do we think”, the right question should be “what do we know”.

The fifth and last type of challenges is the ethical and privacy related challenges. Organisations need to be able to protect the sensitive employee information (e.g. Castellano, 2014). Collecting and using data from different internal and external sources might expose the organisations to discrimination lawsuits. Moreover, do organisations have the right to collect large amounts of data about the employees? Data privacy issues could become a critical question in the future because of the accelerating amount of data on people that can be collected for example over the Internet (Gale, 2015).

2.4.6. Possibilities of HR analytics

In addition to the challenges, there are also major possibilities related to HR analytics. Based on the studies of McAfee and Brynjolfsson (2012), data-driven companies perform better in the financial and operational measures. Many claim that the organisations that are also in the front line of HR analytics have the possibility to gain a major competitive advantage compared to other companies. A Human Resource Competency Study (HRCS) is a survey that has been conducted every five years since the year 1987. In the year 2012, more than 20,000 individuals from around the world participated in it (Brockbank, 2015). On the basis of this study, Brockbank (2015) has identified statistically four issues in how high-performing organisations are using HR analytics, which are listed in Table 11.

Table 11: The use of analytics in high-performing organisations

	Use of analytics
1	The use of external information inside the organisations by HR professionals
2	HR professionals design their practices on the bases of promoting and facilitating the electronic and social sharing of information
3	HR professionals take an outside-in approach to HRM and align their HR practices with the external customer expectations
4	HR professionals understand that organisations have limited cognitive processing space and focus on the external information and limit the less important internal information

These findings are in line with the perceptions made already in the previous parts of this literature review and indicate that HR analytics and the wider concept of data-driven HRM possess major possibilities for the organisations. However, the same HRCS study also concluded that HR is not coping very well with the flow of business information in the organisations, but the ones that are, are creating a substantial value. Next, the possibilities of HR analytics are examined more closely with the same way that the challenges were presented in the previous section. The possibilities are listed according to different types in Table 12.

Table 12: Possibilities of HR analytics

Types of possibilities	Possibilities
HR	<p>Support the data-driven HRM, human capital decision based on data.</p> <p>Enables a more strategic role for HR.</p> <p>Quantified impacts on business outcomes, investments in HR will benefit also other stakeholders.</p> <p>Identifying the critical employees, finding the best talent on the market.</p>
Business	<p>Can produce strategic information for decision-making.</p> <p>Prediction and optimisation analyses.</p> <p>Modern technology to support decision-making more easy to use and more cost-efficient.</p> <p>Analytics can revolutionise whole business in which organisation operates (for example Google, Zappos).</p> <p>Creating a competitive advantage, a possible “game changer”.</p> <p>Redirecting funds to more productive investments if needed (more easy to identify these).</p>
Data/Big data	<p>Volume of data, which continues to increase exponentially and can be used to combine data from different sources (for example business and HR data can be combined).</p> <p>Velocity enables the use of real-time or nearly real-time data as a basis for decisions that are faster and timely.</p> <p>Breaking the data silos to support more inclusive decision-making.</p> <p>“Walking data generators”, the data from everything we do can be tracked and utilised, for example GPS signals from mobile phones (McAfee & Brynjolfsson, 2012: 63).</p>

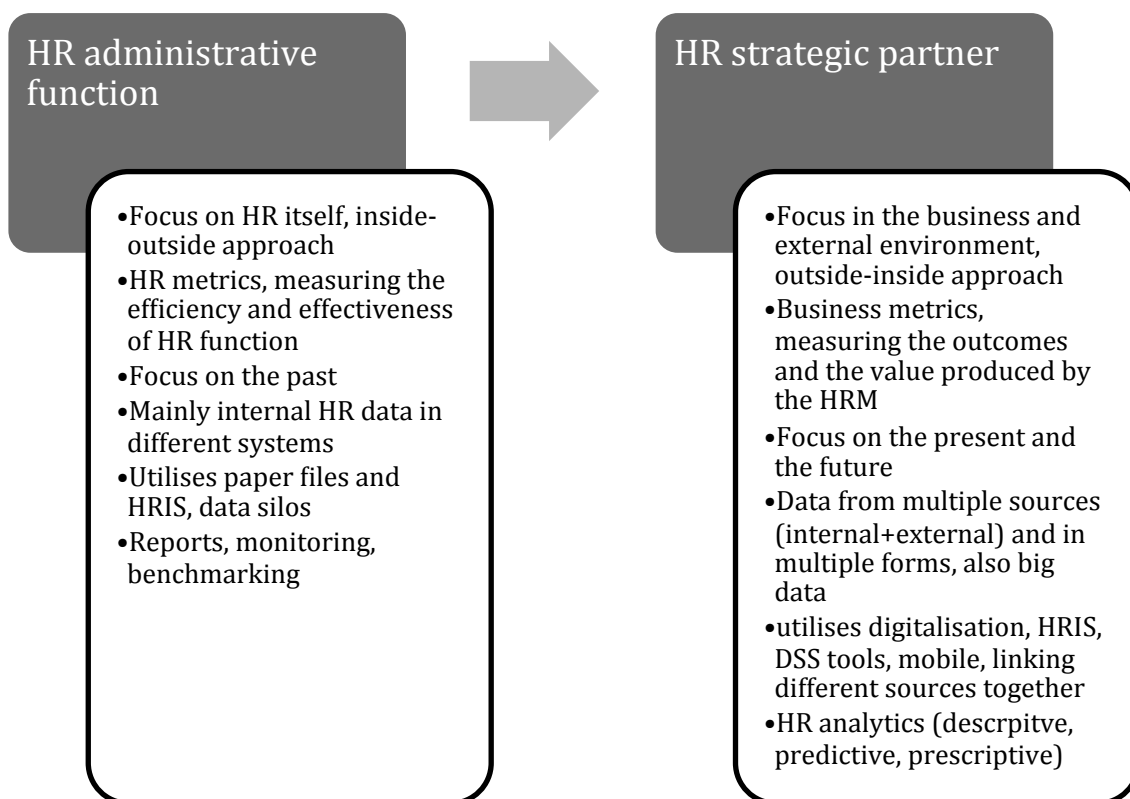
The most prominent possibilities for HR and the overall business were listed. Also possibilities related to data and big data were identified. As a conclusion, it can be argued that the technological development has enabled a significant amount of possibilities that can change and improve the position of HR as well as the organisations and generate value and competitive advantage to organisations. Still, these will remain only as possibilities until HR analytics is implemented and utilised in practice. On the basis of this chapter it can be noted that the successful implementation of HR analytics

starts with the strategy and the outcomes that want to be achieved. After that there is a considerable number of different tools and metrics that can be utilised to help this to be realised in practice.

2.5. Summary and theoretical framework

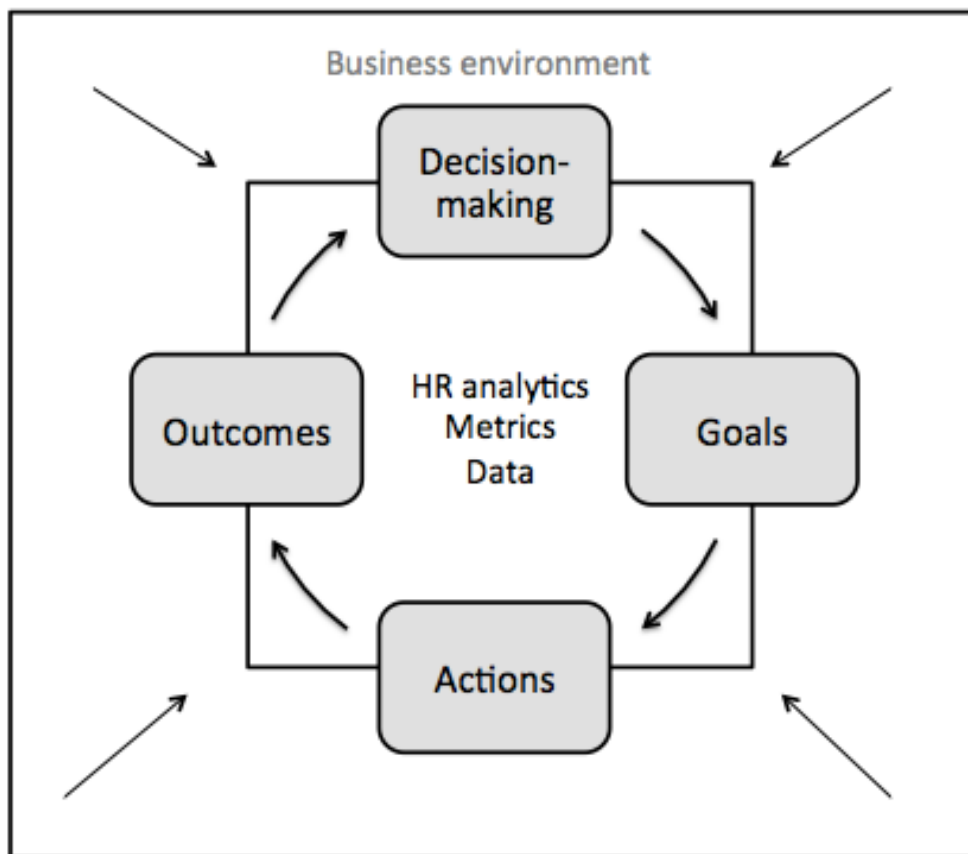
In this literature part, a comprehensive overview of the scientific literature about the data-driven HRM and HR analytics was created. First, the scene was set by describing the overall evolution of HR, which functioned as a background for the examining and understanding of the development of the data-driven measuring and decision-making processes of HRM as well as the actual HR analytics. HR has developed from an administrative function to a strategic partner, which has had a major effect on the measuring and decision-making of HRM. This overall transformation is described in more detail in Figure 13.

Figure 13. Overview of the development of HRM



Data-driven HRM can be described as the fact-based measuring and decision-making of HRM and on the basis of this it was examined in this literature review on three different levels, which are (1) data, (2) measuring and metrics and (3) decision-making of HRM. As an extension to this due to the technological development, HR analytics has offered novel and more sophisticated ways, which have broadened the possibilities of data-driven HRM. As a basis of the literature review, the theoretical framework of this study is presented in Figure 14. The framework illustrates data-driven HRM based on the academic research described in this literature review.

Figure 14. Theoretical frame of data-driven HRM



The starting point for the data-driven HRM is in the broader business context as well as in SHRM. The overall strategic decision-making processes of HRM are based on the business environment, external and internal stakeholders i.e. outside-in approach (Brockbank, 2015; Rasmussen & Ulrich, 2015; Ulrich & Dulebohn). SHRM no longer base their decisions from the “inside-out”, but related to the overall business, and on the basis of that, the goals are set. Goals are then transformed into action, for example

through initiatives, investments and practices, which again lead to HR and business outcomes. These again function as a starting point for the new decision-making. Every step of this decision-making cycle is effected by the broader business environment. Organizations cannot function as closed communities anymore, but with interaction with the stakeholders outside the organization.

The data-driven HRM functions as a basis for this circular strategic decision-making processes. As it was argued throughout the literature review, all the different levels of the data-driven HRM are in fact tools that can be utilised to achieve something (e.g. Fitz-enz, 2010; Levenson, 2013; Rasmussen & Ulrich, 2015). Hence they are not valuable in themselves, but rather in the context that they are used. The data (as well as big data), metrics and analytics offer lot of possibilities and they can be utilised in all of the different phases of the decision-making circle. They can be used to analyse or measure for example the processes, practices, goals or outcomes. Hence the right metrics and analytical tools should also be chosen on the basis of the needs and therefore they are context-bound (e.g. Fitz-enz, 2010; Beatty, 2015). Because different organisations have different strategies, also the analytical tools need to base on the strategy of the organisation (Fitz-enz, 2010). In all circumstances, it is not always adequate to use the most sophisticated analytical tools, but as the decision-making framework of Dulebohn & Johnson (2013) illustrated how different decision-making levels require different tools and also different amount of human judgement.

Still, it can be concluded that the development of HR analytics has enabled the use of novel and more sophisticated tools. This means that more complex, predictive and prescriptive analyses can also be made that combine data from different external and internal sources as a basis for the decision-making. This offers novel possibilities, which could also help to shed new light on the “black box of HRM” (e.g. Boudreau & Ramstad, 2007; Boselie et al., 2005; Walsh, 2010; Jackson et al., 2014) and it this way strengthen the strategic role of HR. However as concluded in the literature review, that the more complex the tools are, the more it requires capabilities from the people that are utilizing them (e.g. Levenson (2015; Ulrich and Dulebohn, 2015).

3. METHODOLOGY

In the previous chapter, we familiarised ourselves with the literature concerning HR analytics and the broader concept of data-driven HRM, which was tightly linked to the overall evolution of HRM and technology. In this chapter, the exact description of the empirical data collection and analysis will be presented in more detail in order to justify the choices, which have been made in the empirical part of this thesis. The structure of this chapter is the following. First, the research approach is examined more closely. After that, in the second chapter, the research design is described, which also includes the research settings, level of analysis and the sampling procedures. In the third chapter, the data collection is presented and, after that, in the fourth chapter the data analysis is described. The fifth and sixth chapters address the quality of this study and the ethical considerations.

3.1. Research approach

The research approach refers to the choice of research methods and there is a general distinction between deductive, inductive, and abductive modes of inference. The deductive mode “proceeds from a set of general premises to a more specific conclusion” in which a theory and hypotheses are first formed and then tested or inductive in which the theory is formed as based on the data that is collected first (i.e Ketokivi & Mantere, 2010: 316; Saunders et al., 2007). The approach of this thesis is inductive, which can also be described as “bottom-up” (Eriksson & Kovalainen, 2008). This means that the research begins with the observations from the data, from which patterns and theory is formed. The goal then is to deepen the understanding of a particular phenomenon.

The classification of a research purpose can be divided into exploratory, descriptive and explanatory (Saunders et al., 2007). However, Saunders et al. (2007) note that the study can have more than one purpose. An exploratory study seeks new insights; deepening the understanding of a specific phenomenon. The study process in an exploratory study is flexible and the direction of the study might need to be changed during the process. The descriptive study again provides information about, for example, specific events or situations. The goal is to describe the phenomenon, its characteristics, and the context in

which it manifests. It can be a part of the exploratory study, so the phenomenon can first be described in detail prior to the collection of the data and the exploratory research. The approach of this study is both exploratory and descriptive, and it aims to examine the current issues of HR analytics implementation. The exploratory aspect of the study is necessary since previous studies on the subject have been quite limited. The potential discovery of the novel elements of HR analytics as a phenomenon is further supplemented by the description of its characteristic and the context in which it is implemented.

I examine this through the perceptions and opinions of HR professionals about HR analytics and data-driven HRM. This is done by identifying the meanings that HR professionals assign to HR analytics in blogs of online communities and examining the possible links between HR analytics and the overall role of HRM. To this end, the study utilises mixed methodology by synergising the identification of patterns in data through quantitative text network analysis (TNA), with contextual insights and interpretation of meanings via qualitative content analysis (CA). A more detailed description of the research methods used in this thesis is presented in the following sections.

3.2. Research design

The research design describes the overall design of how the research questions of the study will be answered (Saunders et al., 2007). As stated in the previous chapter, the objective of this study is not to test or explain theories, but rather to describe the HR analytics on the basis of how HR professionals see it and what kind of meanings they give to it. Because of the previous studies in the subject have been quite limited, more information is needed of how HR professional perceive HR analytics and further information is also needed to understand how HR professional utilise HR analytics and to what effect. In addition, special focus is directed on the decision-making, measurement and the overall role of HRM, because of the theoretical literature review revealed that the scientific research strongly linked HR analytics to the broader concept of data-driven HRM and the overall evolution concerning the role of HRM.

The starting point of this empirical study is the perceptions of HR professionals, which are then compared to the theoretical framework. The perceptions of the HR

professionals are examined through blogs and the empirical data is collected from the blogs of major online HR communities. Blogs are described as mini websites (Thelwall & Hasler, 2006), online diaries or self-narratives (Hookway, 2008). They are not objective information or editorial writing. The attitudes and opinions of the writers appear on the posts, so they also tell the story about the public opinion (Thelwall, 2007). According to Thelwall & Hasler (2006), if a researcher is interested in attitudes and opinions about a specific topic instead of testing a theory, blogs can function as a relevant source of data. Bruns & Burgess (2012) emphasise blogging as a cognitive and communicative process. In this process, blog writers can identify themselves and form opinions about certain topics and do this in interaction through a social process with other bloggers. Bloggers express their individual opinions on blogs. Although these are the private opinions of individuals, when combined, they can form a collective opinion of a larger group on a specific topic (Gloor et al., 2009). Blogs also provide a temporal continuum as a data source, which makes it possible to examine how the opinions and attitudes have changed over time (Thelwall, 2007). In addition, they also provide very current information. When studying a very topical subject, it is critical that the data that is used is also very current and that it is publicly available (Hookway, 2008).

The major advantages of blog data include accessibility, real-timing, and the lack of researcher intervention and hindsight bias (Hookway, 2008). The focus is on listening instead of questioning (Poynter, 2010). The data is obtained after the blog posts have been written and posted, so the collection process remains free of researcher influence. In addition to the lack of a predetermined data structure, it also separates this approach from more traditional types of qualitative data collection. When compared to interviewing, in blogging the writer can take the story wherever she or he wants and write about things that actually feel important and significant for her or him and also use their own language in the writing process (Poynter, 2010). When conducting an interview, the interviewer has always some kind of effect on the interviewee and the interview situation, which can be an advantage or disadvantage depending on the research purpose. There still are also limitations when using blog posts as a data source. Compared to surveys, in which the data can be sampled for specific purposes, which

makes it possible to test certain hypotheses and establish the antecedents and outcomes of specific processes. These again would be very hard to do with blog posts.

The actual process of the empirical research of this study can be divided into three different main phases: searching the suitable blog communities, collecting the data and analysing the data. According to O’Leary (2011: 823) the analysed blogs can be selected on the following bases: “(1) small selected set of blogs, (2) random set of blogs, (3) all available blogs, (4) blogs of particular type, (5) blogs from a particular time period or (6) an experimental set of blogs”. For this thesis the blogs were selected on the basis of “small selected set of blogs”. This was done, because of particular interest in the opinions of HR professionals. Still, the research was limited to only HR communities so no individual private blog sites were included in this study. The blog communities that were chosen for the empirical data sources were CIPD, SHRM, HRZone, HRTechEurope and TLNT. These blog communities were chosen on the bases that they are major European and American HR communities on the Web. They are also respected and considered to be reliable among the HR professionals. The choice was also affected by the fact that there needs to be an ongoing and active debate in variety of current themes in HRM on the site. On the practical side, there needed to be several bloggers and adequate search functions, as well as archives over several years. Next is a brief presentation of the selected communities.

CIPD

Chartered Institute of Personnel and Development (CIPD) is a global non-profit association founded in 1913 with 140,000 members consisting of HRM professionals. Their bloggers are a combination of their own personnel and also visitors. As they themselves say, their mission is “championing better work and working lives”. In addition they provide training, conferences, career support and specialist qualifications. (cipd.co.uk).

SHRM

Society for Human Resource Management (SHRM) is also a global HR membership organisation founded in 1948 with 275,000 members. They are official providers of

training, certification, information, conferences and networking for HR professionals. They have bloggers from their own professionals and other HR professionals (blog.shrm.org).

HR Zone

HR Zone is an independent online community for HR professionals founded in 2000 by the publisher Sift Media with over 86,000 members. It has editorial content and also interactive forums and blogs. Their goal is to keep members up to date with the latest trends and news about HRM and also to activate their members to network and share knowledge (hrzone.com).

HRTech

HR Tech World is the blog site of Pan European HR Network and conference (HRN Europe). Their main focus point in HR is the future of work and the technology revolution. In their own words, they are “the world’s fastest growing HR community” (hrneurope.com).

TLNT

TLNT is an online publication founded in 2010 by Era Media and they are focused on talent management and HR. They offer the latest news and information about HR. They have both editorial content and also blogs from their own editors and outside HR professionals (eramedia.com/tlnt).

3.3. Data collection

After choosing the blog communities, the next phase was to determine the keywords for the blog posts searching. This was done in two different phases. The first keywords were chosen on preliminary study of the literature and key websites. The initial keywords that were chosen were “HR analytics”, “analytics” and “big data” in addition to “workforce analytics” for one site (HR Tech). On the HR Tech site, the possible search keywords were already pre-given so the “workforce analytics” were chosen on that basis. Otherwise, the selection was done based on the fact that these were the words that were often referred to when talking about HR analytics in the academic literature.

The reason why the keywords were chosen in two different phases is that there is still very limited prior research on the subject and especially research on online blogs, so it was difficult to know precisely in advance what kind of terms or definitions are used when talking about HR analytics. In addition, the practitioner and academic literature may use different terminology.

By going through the results and the actual blog posts from the first search, it helped to identify these terms and definition and understand the way the HR professional speak when they are talking about HR analytics. This method was chosen in order to get the most comprehensive data concerning HR analytics. For the second round only one keyword, “metrics”, were chosen. This decision was made partly because of the first round already produced a large number of research results and the collecting of these posts will take a significant amount of time. The “metrics” keyword was chosen because it was a concept that was often used in the same context both in the literature as well as in the professional vocabulary when talking about HR analytics and the data-driven HRM.

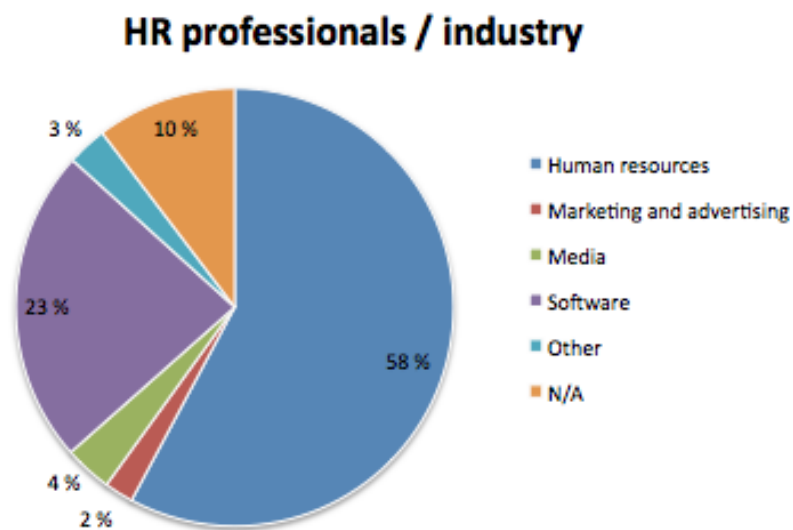
The data was collected longitudinally. The goal was to collect the data as long a period of time as was available in the archives. The archive and timelines varied depending on the site. Before the actual data collection could start, first it had to be figured out how the blog posts can be searched. This meant familiarising more closely with the blog sites and the search engines. Some of the sites were easier to use, while other required more manual work on the search processes. The search started from the oldest blog posts. This method was chosen in order to ensure that the most recent data could also be collected. Collecting was extended until the end of 2015.

After determining the first keywords, the next phase was to create a research protocol. This meant systematising the data collection by creating both the system of folders (source/year/month) and the spreadsheet database (username, position, company, size, industry, source, link, date). When the research protocol was determined, the first round of data collection was done. This was done in October, November and December 2015 and the second round was done in March 2016. Altogether, 510 blog posts were collected from years 2009 to 2015. The keyword search produced more blog posts than

were actually collected, but this was due to the fact that different keywords could lead to the same blog post that was already collected. Altogether 78 blog posts included more than one keyword. The possible combinations that came up were “(HR) analytics and metrics”, “(HR) analytics and big data” or “(HR) analytics, metrics and big data” or “big data and metrics”.

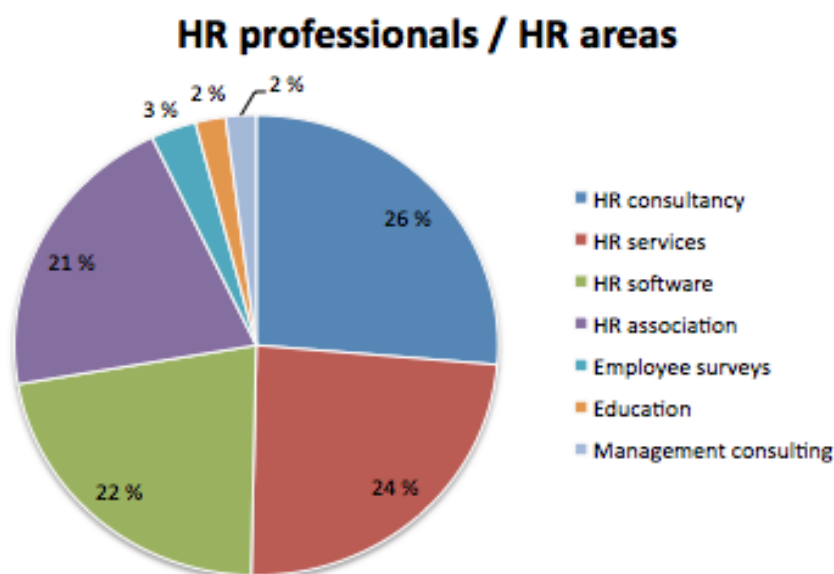
In the data collection phase, the background information about the HR professionals and blog writers was also collected in order to define who the HR professionals actually were, whose perceptions are examined in this thesis. In Figure 15, the HR professionals have been presented on the basis of the industry. As we can see from the chart, the majority (58%) of the professionals are from HR. The next largest group with 23% is software and 10% are in the group with an unknown industry.

Figure 15: HR professionals/industry



The next chart in Figure 16 describes the HR sector from the previous chart more closely. 26% of the sector is from HR consultancy, 24% from HR services providers, 22% from HR software providers and 21% from HR associations. The rest are small minorities from employee survey providers, education and management consulting.

Figure 16. HR professionals/HR areas



The professional information of the HR professionals was also collected. The exact list of the job positions and their division can be seen in Table 13.

Table 13: HR professionals/Job positions

Job positions (other)	Percentage	Job positions (HR)	Percentage
Management positions	55 %	HR positions	11 %
Founder	2 %	HR management	6 %
CEO	9 %	HR generalist	1 %
C-level	9 %	HR consultant	4 %
Director	7 %		
Vice president	4 %		
Manager	24 %		
Other positions	34 %		
Analyst	1 %		
Consultant	2 %		
Public relations	3 %		
Marketing	7 %		
Other	10 %		
N/A	11 %		

55% of the professionals are from different management positions. 34% are from other positions, including analysis, consultancy, public relations and marketing. This section also includes the individuals with unknown positions and group “other”, which includes individual representatives of different minority positions. 11% of the professionals are

from different HR positions, which are divided into HR management 6%, HR generalist positions 1% and HR consultancy positions 4%.

3.4. Data analysis

The data analysis consists of two phases. The first phase is quantitative; it deals with the data at the aggregate level, and looks for patterns in associations between concepts in the blogs through the text network analysis. The analysis in this phase is done with the Leximancer software tool, which enables the automatic data analysis to form the preliminary computer generated coding of the data. By using algorithm it search for frequency and co-occurrence of words in text segments and identifies contextual patterns. The Leximancer is particularly appropriate for this thesis, because of the large amount of data and with the help of the software the amount of manual labour in the first phase could be diminished and the preliminary coding could be made. In turn, the second phase is qualitative, it deals with individual blog entries, and seeks contextual interpretation of relationships between previously identified concepts though qualitative content analysis. Combining these methodologies allows more comprehensive outlook on the subject.

Leximancer (v. 4.0), used in the quantitative phase of analysis, is a software tool that is used to analyse large quantities of text data to uncover their structure, i.e. semantic patterns (Smith & Humphreys, 2006). It is a natural language processing tool based on the statistical algorithms to analyse the content of the data and to identify distinct concepts as a basis of this data, which are displayed as a concept map that functions as a basis for more detailed qualitative analysis. Leximancer is based on the Bayesian theory and the analysis in which the data analysis is done in two stages (Smith & Humphreys, 2006). First stage is the semantic extraction strives for “(1) to construct classifiers for multiple concepts that can predict whether a small segment of text contains one or more of the concepts, (2) to provide a meaningful name for each concept as a signifier; this is done to support interpretation and visualization, (3) to allow the concept set to characterize the message conveyed by the text corpus, (4) to also allow manual customization of the concept set prior to learning of the representations” (Smith & Humphreys, 2006: 264). In the second stage, relational extraction generates the concept

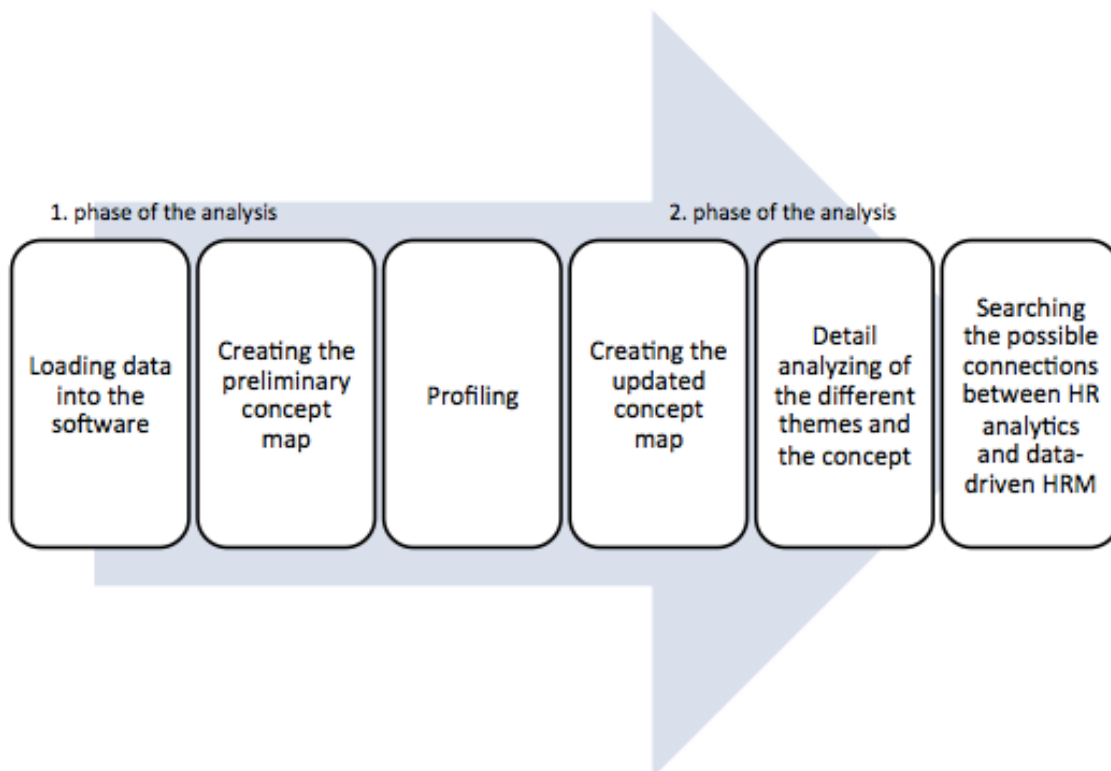
map. It also provides statistics for example concept count and concept co-occurrence count (Smith & Humphreys, 2006). The method of Leximancer can be called a form of text mining or semantic mapping (LMJU, 2011). The advantage of the Leximancer, in addition to facilitating the analysis of a large amount of data, is that it provides an unbiased automated coding of the data so it can be used as a primary coding tool, which identifies the central themes and concepts that are basically the coding categories. This functions as a basis for the manual qualitative context analysis to establish the context in which these concepts are used.

In general, coding is a good method when there are large amounts of data to be analysed. In coding, the goal is to distinguish experiences and patterns of the ways to give meaning to things. More closely in this study it refers to how HR professional talk, characterise and understand the HR analytics and related themes. Coding proceeds from categories to concepts and sub codes and from them to themes. In this study, the coding type is descriptive and thematic coding in which the codes emerge from the data. The goal is to capture the essential elements of the data in hand and find similarities and patterns. It is not only labelling different concepts but also linking them together in a winding process (Saldãna, 2013). Because HR analytics is still a novel and developing area, descriptive coding enables summarising the primary topic of the subject and the thematic coding again forms an understanding of what the topics are that are being discussed in the area of interest.

The content analysis of Leximancer extracts meaning (semantic) and relational information (Leximancer, 2016). More specifically, it examines the collection of words in the text i.e. their meaning as well as their interconnections. As a result, it produces a concept map. The concept map describes, in a grounded way, how the words connect to each other by proximity and spacious connection. Leximancer examines how the words are used and the connection between the words i.e. what words are mentioned together. In the semantic analysis, the terms around word indicate its meaning and the Leximancer groups the related words that travel together in the text. When the Leximancer has identified the distinct concepts and arranged them into a concept map, it is the researcher who interprets the meanings behind these concepts.

The overall process of the analysis can be seen in Figure 17. Still in reality the process is more of an iterative entirety in order to form a complete picture of the subject at hand. In this way, the overall analysing can be described as a learning process in which the scientific and empirical part and also the quantitative and qualitative process all support one another.

Figure 17. The data analysis process



The concept map produced in the outset of data analysis usually needs some level of manual adjustment before proceeding to the second analysis phase. This stage of the analysis is called profiling. Leximancer is software that produces the concept map by using statistical methods and therefore usually needs also human judgment and involvement. For example Leximancer names the themes according to the most prominent concept in that theme, which in reality might not describe the actual meaning of that theme.

After the concept map is updated, the second phase of the analysis begins. In this phase, the researcher interprets the meanings behind the concepts. This is done by reading and analysing the actual blog posts found related to the different concepts and identifying

the dominant themes and patterns in the overall discussions of the HR professionals. In addition to the overall concept map analysis, a separate, more detailed analysis was also made based on the concept “HR analytics” to identify the direct concepts that were linked to the HR analytics. This was done on the basis of the overall concept map in which the direct connections to HR analytics were identified. This kind of twofold approach was chosen in order to identify the major themes emerging from the overall data and to identify the focus of the discussion when the theme of HR analytics was particularly observed. A special focus on the latter analysis was also directed to identifying the connections between HR analytics and data-driven HRM.

3.5. Quality of the study

The two classic evaluation criteria of research methods are reliability and validity (Eriksson & Kovalainen, 2008). These criteria are more characteristic of the evaluation of quantitative research, but are also to some extent applicable to qualitative studies. However, it is noteworthy that there has been much debate about the suitability of these criteria in the evaluation of qualitative research (Eriksson & Kovalainen, 2008). Reliability refers to the likelihood of obtaining similar results if the study is replicated. As mentioned before, the researcher remains a passive observer. The first phase of the analysis that is made with Leximancer is independent from the researcher while in the second analysing stage the researcher makes interpretations based on the data.

Validity measures how well the results of the study correspond to the original research questions. The objective of this study was not to test or explain theories, but to describe the HR analytics on the basis of HR professionals’ perceptions and what kind of meanings they give to it. The starting point to this is the blog posts of HR professionals and how they perceive the field of HR analytics and to illuminate in more detail to what they actually implement HR analytics and also examine the link between HR analytics and decision-making. Against this background it should be noted that the HR professionals in this case present only a selected group of people i.e. those who are actually active in the blog community. The additional implication of that, and the potential lack of background data, is that it is hard to judge whether these HR professional come from example “successful” companies or have actual experience with

HR analytics. In addition, the blog posts only represent the bloggers personal opinions (Thelwall, 2007), which should be noted and taken into account. However, due to the framing of the research questions this does not cause a conflict between the research data and its analysis. Because the goal is not to test a theory but rather the examine the perceptions and opinions of HR professional and through this discover elements and relationships and describe the context and phenomenon concerning HR analytics, the blog posts of online HR communities serve as a good source of data for this kind of study.

It is also appropriate in this context to note the trustworthiness of the bloggers. Although we cannot be sure of the trustworthiness of the blog posts, they still tell us something about what kinds of meanings are given to certain themes and issues and they provide us information about how they are discussed in these communities (Hookway, 2008).

3.6. Ethical considerations

Ethical issues in research include things like “voices, consent, privacy, anonymity, interpretation, ownership and authorship” (Sixsmith & Murray, 2001: 8). New online tools, like using blogs for scientific research is relatively new. Naturally this also brings new challenges and dilemmas when thinking about the ethical considerations (Hookway, 2008; Sixsmith & Murray, 2001). A lot of discussion has been carried out in producing an ethical guideline for conducting “online” research (Hookway, 2008).

The major question is the ownership of the blog posts (Hookway, 2008). Does the researcher have a right to use materials that one finds on the Internet or is there a need to ask permission before using them? There is not yet a homogeneous answer to this question. A lot of different opinions can be found. It can be argued that, because the blogs are publicly available, they are also publicly accessible (Hookway, 2008). These can be compared to those blogs that are not publicly available but limited only for the usage of friends. In addition, it can be noted that no personal information about the bloggers are disclosed in the study. They neither have any bearing on the data analysis or the research results since only overall trends are analysed and the Leximancer discovers connections across the overall body of text. Individual perceptions are only

important to the extent that they influence the overall structure of the data and provide additional contextual insights.

Another thing that needs to be taken into a consideration is the copyright law (Hookway, 2008). There naturally are differences between the legislation of different countries but in the US and the UK, for example, the material on the Internet is automatically protected even though up to a certain point the use in research purposes is acceptable (Walther, 2002; Hookway, 2008). “The fair use” enables the use of copyright-protected works in certain circumstances. The fair use is defined with four different criteria according to the U.S. Copyright Office (2016), which are (1) purpose and character of the use, including whether the use is of a commercial nature or is for non-profit educational purposes, (2) nature of the copyrighted work, (3) amount and substantiality of the portion used in relation to the copyrighted work as a whole (4) effect of the use upon the potential market for or value of the copyrighted work. In this thesis, copyright-protected works are used only for non-profit academic purposes, they are used only limited amount and they have no effect on the value of the copyrighted works. Therefore, it can be noted that the use of copyrighted works was only limited to fair use.

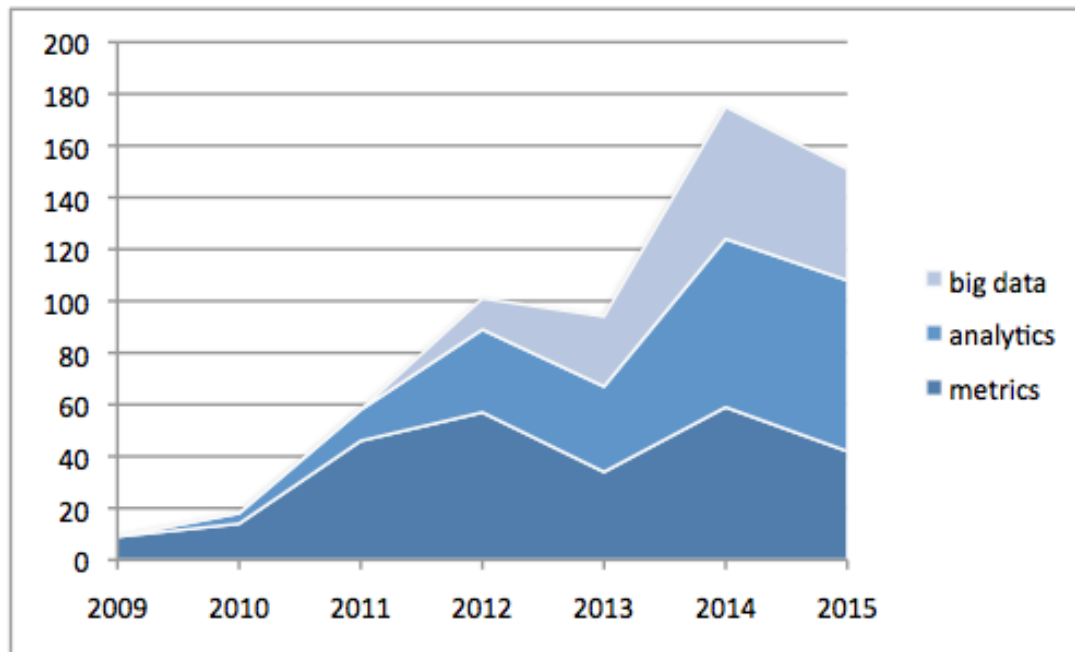
4. ANALYSIS AND FINDINGS

This chapter presents the results of the empirical analysis made on the basis of the discussions of HR professionals. The objective is to examine the perceptions and opinions of the HR professionals about HR analytics, which is done by identifying the meanings they give to HR analytics in blogs in the online communities. Special focus is also directed to the data-driven HRM and the overall role of HRM, because the theoretical literature review revealed that the scientific research strongly linked HR analytics to the decision-making and measurement of HRM and the overall evolution of HRM role. As mentioned in the previous section, the preliminary analysis was done with the Leximancer software and a concept map was created that served as a basis for the qualitative phase of analysis. This is done manually by the researcher who uses the concept map and the blog posts to interpret the meanings behind the concept map. The theoretical framework is then compared with the empirical material in the next chapter.

The data was collected on the basis of pre-defined keywords, which are “HR analytics”, “analytics”, “metrics”, “big data” and for one site the “workforce analytics”. In addition to this, the data also contains a broad discussion from other topical HR issues. In this thesis, however, the focus is only on the discussions related to the research questions, which were chosen with the keywords. The data was collected longitudinally, but the analysis of the data does not distinguish between different years, rather it is analysed as a whole. The goal is to examine and describe the entity and its various details in-depth and as accurately as possible. However, a brief summary of the overall data was carried out based on the frequency of the keywords in different years, which can be seen in figure 20. It would be hard to make significant conclusions on the basis of this analysis, but it does provide an interesting insight into the growing frequency of the keywords “analytics” and “big data” in recent years. The concept “analytics” in figure 18 subsumes all the keywords related to analytics, including “analytics”, “HR analytics”, and “workforce analytics”. This is done to show the overall development of the blog posts found with the keywords related to analytics. In the years 2009, 2010 and 2011, the keyword “big data” search did not produce any blog posts, whereas the keyword “analytics” features in only very few blog posts in the same period. However, since

2012, the prominence of both of these keywords has been steadily growing and emerged as a central trend among HR professionals. Similar progress was not seen in the keyword “metrics”, but it appeared more evenly throughout the observation years.

Figure 18. Keyword frequency 2009-2015



The structure of this chapter is the following. First, the conceptual analysis is examined more closely. In this part, a more detailed overall analysis of the data in the form of a concept map was produced by Leximancer. The concept map shows us what the major themes are that stand out from the whole data. In this way, it can be analysed in general what the central themes are in the discussion of the HR professionals with the predefined keywords. Because of the different keywords used to collect the data, HR analytics was not the most prominent theme that emerged the overall data. However, the analyses are performed on the basis of the concept map produced by Leximancer in order to see how the HR analytics was discussed by the HR professionals and how they profiled in the overall discussions related to the other themes. In the conceptual analysis part of this chapter, every one of the major themes of the concept map is examined in more detail in their respective sub-sections. This is done by identifying the most central topics of discussions in every theme and analysing them in more detail.

The latter part of this chapter focuses more specifically on the HR analytics itself. HR analytics is analysed with a co-occurrence map that shows how it is linked to different concepts and what these concepts are. In this stage of the analysis, the most prominent themes that HR analytics is connected to in the discussions of the HR professionals can be identified. In the same context, the connections between HR analytics and the data-driven HRM is examined. What kind of connections can be seen between these concepts in the overall data? The last part of this section pulls together the analyses conducted in this chapter and makes a summary based on the analyses of the empirical data.

4.1. Conceptual analysis

Nine distinct themes were identified in the Leximancer's concept map, which can be seen in Figure 19. These concepts are "organisation", "employees", "HR", "data", "social media", "learning", "culture", "change" and "management". The concept map is the visual display of the concepts that shows the most talked about issues in the texts, which it has clustered into bigger, higher-level themes (Leximancer, 2011). The concept map shows the frequency of occurrence and the relationship between concepts.

The small grey dots on the map are the concepts and the collections of concepts that most commonly co-occur in the text, which are interconnected forming the themes. The size of the concept dot depends on the frequency that the concept appears in the texts and the proximity between the concepts regarding how close together the various concepts appear in the text. The most talked about concepts in the discussions were "employees", "business", "HR", "data", "management", "people", "talent" and "performance". Still these concepts as they are do not reveal any deeper meanings about the discussions, so more accurate analyses is needed to understand in which contexts these concepts are discussed and what the concepts are that link to each other throughout the texts.

concepts within that theme giving us a way to measure the importance of a theme within the dataset”. The first four themes are fairly closely linked with regards of the connectivity, varying between 88% and 100%. Importantly, the graphic representation of each theme’s size is not representative of its prominence; rather, it only reflects the boundaries of that particular theme. In turn, the prominence is determined by the number of concepts that are found inside the theme, which are also presented in the thematic summary.

Table 14. The thematic summary

Theme	Connectivity	Concepts
organisation	100 %	organisation, management, workforce, strategic, metrics, needs, leaders, impact, strategy, development, focus, research
employees	98 %	employees, company, performance, engagement, recognition, managers, team, working, results
HR	89 %	HR, business, people, value, human, future, role, professionals
data	88 %	data, talent, analytics, technology, system, information, skills, decisions, solutions, software, industry, market
social media	46 %	social, job, process, media, recruitment, hiring, candidates, experience
learning	16 %	learning, training, approach, benefits
culture	11 %	culture, success
change	9 %	change, report
marketing	2 %	marketing

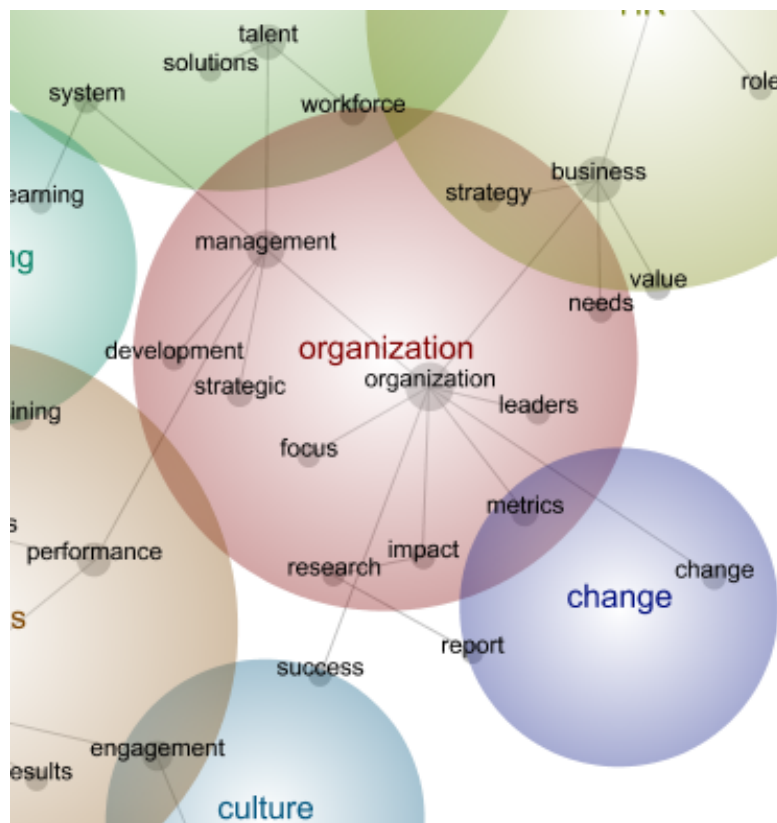
The most prominent theme on the concept map is the “organisation” with the connectivity score of 100%. It is closely followed by the themes: “employees”, “HR”, “data” and in some distance from the “social media”. Only minor connectivity is found with the themes of learning, culture, change and marketing. In the following section, I closely examine the most prevalent themes on the concept map to understand the issues considered most topical among the HR professionals and examine the possible links to HR analytics within these discussions.

4.1.1. Theme “organisation”

The theme “organisation” is the most central and dominant theme in the data with the connectivity score of 100%, which indicates the importance of the theme. The concepts

within this theme are: “organisation”, “management”, “workforce”, “strategic”, “metrics”, “needs”, “leaders”, “impact”, “strategy”, “development”, “focus” and “research”. These can also be seen in the snapshot of the overall concept map in Figure 20.

Figure 20. Snapshot of the theme “organisation”



During the qualitative analysis, two major concepts have emerged within this theme: “organisation” and “management”, which are examined in more detail below. Under the concept of “organisation”, two major discussion topics could be distinguished, which I named here “the seat at the table” and “the bottom line”.

“The seat at the table”

A large portion of the discussion of HR professionals was focused on the role of HRM in the organisations. HR professionals saw that HRM was an important function, maybe even the most important function in the organisations, but still seemed to lack attention

from the board. In order to achieve this attention, they need to form a better understanding of the business and focus more on the value that they can bring to it and also find a way to communicate this to the board. The next statement illustrates this:

“I’m always astounded that the HR doesn’t have a seat at the table. Today the lion share of corporate value nearly three-quarters by some estimate comes from an organisation’s people and their ideas, innovations and performance”
(01/09/2011, Editor)

HR analytics was perceived as a potential way to achieve this goal. In order to benefit from this, HR professionals think that they first need to become “financial savvies” and understand the bigger picture i.e. how the economy affects the industry and the organisation, and what demands this places on the HRM. They also noted that this is not easy to achieve in practice because of the constantly changing operational environment. However, if the major drivers of organisational success for HRM can be identified, then the accurate and value producing metrics can be defined enabling the use of the data across organisations to support better insights and decision-making. Still, some argued that accuracy and focus is required or otherwise all possible things will be analysed without understanding their meaning. Consequently, many HR professionals argued that HR analytics was still in the early stages of development in many organisations, which can be seen in the next comment:

“Only 14% of HR teams are truly using analytics. If your answer is a nervous laugh, you’re not alone. An industry study last year found that only 15 per cent of organisations believed that HR teams had strong credibility when it came to using analytics” (02/10/2014, Editor)

A large portion of discussion was also focused on the HR function itself and its place in the organisational structure. This could be seen at least in part to evolve from the previous discussion of HR analytics. If the role of HR analytics increases it might also

result to the overall re-evaluation of the HR function. This can be seen for example in the next comment:

“Should HR stand alone as a strategic function in the organisation and, as such, report directly to the CEO as part of the executive team? Or should HR be part of the Finance department (or another department)? (01/11/2011, Editor)”

If the HRM concentrates more on the data collecting, processing and analytics, it was pondered in the discussion that maybe the HRM as a function should be reorganised as a part of some other function, for example the finance like already noted in the previous comment. At least many HR professionals saw that more cooperation between different functions, for example HR and finance, marketing and engineering, were needed in order to utilise different data sources across and aspects to form more comprehensive outlook of central organisational issues in order to bring value to the business.

“The bottom line”

The second major topic under the theme of organisation was “the bottom line”. This refers to the way HR professionals talked about contributing to the whole strategy of the business and finding the ways to do this in practice like seen in the following statement:

“Developing a business case that invests resources in the people side of the business positively influences everyone not only within the organisation, but external factors as well, and ultimately, the bottom line.” (12/12/2012, Editor)”

But what is the “bottom line”? This was one central question in many discussions of the HR professionals. One major view stood out of these discussions. Many HR professionals saw that the employee engagement is the ultimate factor that links strongly all the way to the customer satisfaction and business results. Hence, when measuring and developing the employee engagement, it should begin already from the candidates in the recruitment process and direct all the way to their departure from the

organisation. This was referred in one blog post as the “service-profit chain”, which can be seen in the following comment:

“This concept is that if you start to focusing on your employees and ensuring that they are engaged and aligned to your purpose, it is only then will you see great customer satisfaction.” (30/03/2015, Editor)

Comments were also made about the fact that HR analytics is already enabling better absence analyses, in addition to measuring the cost and frequency of the joiners and leavers of the organisation. In this case, the focus is on the onboarding practices and identifying the characteristics of the employees staying versus the ones that are leaving. Criticism was also directed at some of the traditional ways used to measure the engagement, for example the exit interviews or the annual engagement surveys. According to many HR professionals, more in-depth tools are needed. The engagement measuring and analytics need to be connected to the business results and analysed at multiple levels of the organisation.

“Moving from guessing to knowing”

The second major concept under the theme of “organisation” is the “management”, which includes wide range of management issues, such as performance and talent management, but also the way in which HRM may affect the top management of the business. Overall, the discussion was focused on few specific topics around this theme. One such topic was about questioning the best practices as illustrated in this comment:

“The primary cause for this failure in talent management is our worship of best practice. In fact, for most organisations, best practice worship has replaced an organisational framework for how to define, measure and manage talent for business results.” (05/09/2013, Editor)

In this way, the focus of the management was observed to be more on the practices than on the actual results that are achieved. Several noted that in multiple cases management practices might look convincing and impressive, but in reality they may lack the value of producing business-focused results. Many comments emphasised asking the right

questions and solving the right problems instead of simply putting to use best practices. Some comments also talked about moving from “guessing to actually knowing within reasonable certainty” what is happening in the talent or performance management. In this development, HR analytics was seen as a major possibility.

“Predictive analytics are superior because they analyse past and current data and reveal patterns and trends that may allow you to accurately predict upcoming people management problems and opportunity.” (06/11/2014, Editor)

Also challenges were noted. Some comments emphasised that the important thing is to “get the basis of data management” right. In this way, the analytics is thought of as a tool that is useful only if it is used together with the human intelligence. Another possible challenge was in the way HRM can attract the attention of the senior management team, which so often is not the case nowadays. In addition to this, it was stated that HRM is not keeping up with the development as the other functions as detailed in the following comment:

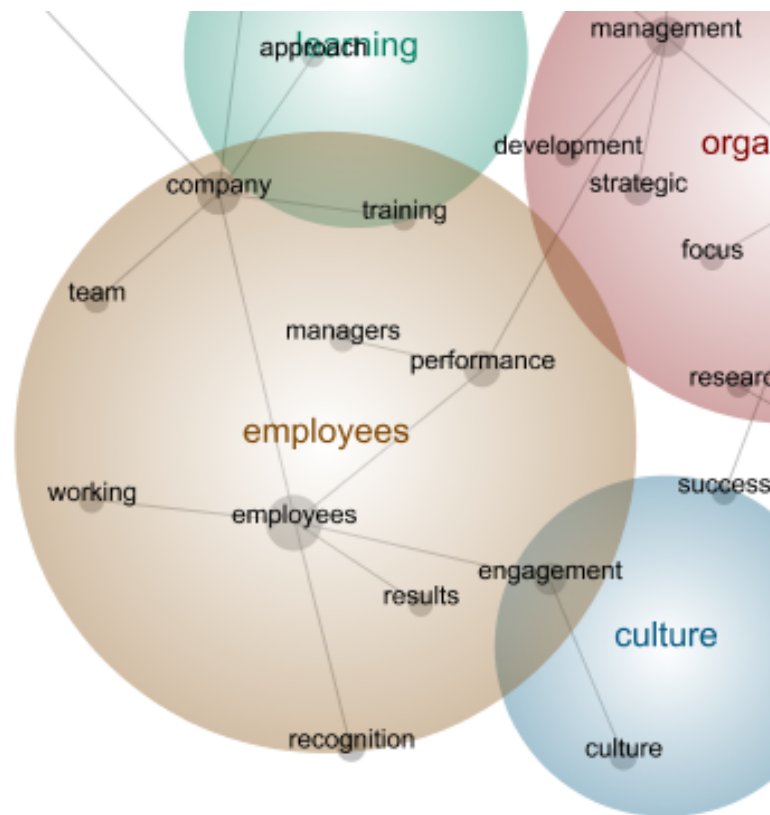
“HR is falling behind other functions in the use of more sophisticated analytics; and among the apparent reasons is a (rather distressing) belief that HR is not sufficiently skilled to use such techniques.” (22/11/2013, Editor)

4.1.2. Theme “employees”

The second central theme of the concept map is the “employees” with the connectivity of 98% seen in the snapshot of the overall concept map in Figure 21. The concepts linked to this theme are “employees”, “company”, “performance”, “engagement”, “recognition”, “managers”, “team”, “working” and “results”.

The two most frequently used concepts under this theme were the “employees” and the “company”. The concept “employees” has been mainly discussed along with the topics of employee engagement and work performance, as examined in the following sections.

Figure 21. Snapshot of the theme “employees”



“The black box of engagement”

The discussion on engagement focused strongly on measurement and results. Many HR professionals noted that although engagement can be seen to have a major effect on the financial results of organisations, for example through turnover costs, the engagement levels in many organisations continue to stay low. At least partly, this is seen to result from uncertainty as to how the engagement can be measured in practice, leading to discussion about the traditional ways of measuring and practicing HR. For example, exit interviews were perceived by many as an outdated and inefficient way of measuring engagement. Popular annual employee satisfaction surveys were also thought to be ineffective and new and faster ways of measuring engagement were needed, as the next comment illustrates:

“If we only track them as employees exit and become another statistic, we are missing a huge opportunity. If you continue to churn employees, this represents a sinkhole of money going down the drain.” (24/04/2012, Editor)

Many professionals saw the challenge in that the HR measures something that they are used to measure instead of thinking about what are the actual results that come from it. Some saw that there is a need to find metrics that are meaningful and clear to everyone. Discussion about context also took place. Should universal metrics be used or should they be customised to the business needs in order to bring value to the organisation? Many comments also noted that the employee data cannot be handled in silos anymore, as illustrated in the following statement:

“HR can no longer confine employee data to its silo; organisations need access to those data to be successful. What kind of analytics do you look for from your Human Resources numbers?” (05/11/2011, Editor)

Technological developments were seen as a major possibility for HRM. The faster and better software, as well as the demolition of data silos, were thought of as the route to a more efficient measurement.

“Traditional annual review has had its day”

In the second topic, work performance, some of the same topics were referred as in the previous section. Many comments, which in some places used very rough language, stated that the annual reviews are not functioning anymore. They were portrayed as often negative, one-sided and non-efficient “administrative nightmares for HR and line managers” like the next comment illustrates:

“The annual review will soon be a thing of the past, replaced by a more passive model of ongoing collection and analysis of data offering a much more dynamic and data rich view of employee performance.” (23/12/2015, Editor)

Once a year, monitoring was seen too slow of a pace to measure performance. They were also seen to lack results and the overall focus was too much on the past. It was

described as the “post mortem of the employee’s performance” in one comment. Also much of the discussion concerned the metrics used in these evaluations. It was noted that good metrics clarify roles and responsibilities. The metrics should be linked to the goals, which should be transparent and linked to the overall value for the customers. Again technological developments and more efficient data collecting and processing tools were seen as major possibilities, as described in the next comment:

“Now it has become easier to generate some predictive analysis by reviewing several areas of machine-generated daily employee data such as: high volume of emails, phone log times, meeting attendance and participation, utilising Customer Relationship Management systems (CRM), analysing data such as sales volume, numbers of calls, customer satisfaction.” (28/10/2015, Editor)

Analytics were seen as a possible way to link the employee performance more tightly to the business performance. It was noted that much data is collected from both the employees and customers and when using these to improve critical HR functions they can be linked directly to business outcomes as noted in the next comment:

“More advanced analytics can uncover powerful relationships between employee survey data and business performance outcomes like customer satisfaction and profit margin.” (05/11/2012, Editor)

Combining various data from different sources, for example performance reviews and employee absence data, was also seen as a possibility for new openings as well as different mobile devices and apps. When the ways of working are changing, the measurement and management also need to change. People now work more in collaboration in cross-functional team, social media networks or mobile teams with new collaborative technology tools, so it is understandable that this places pressure on the performance measurement and management.

“Good data or bad data?”

The company was the second major concept in the theme of employees, which is now examined more closely. The discussion primarily focused on what should be measured

when thinking about the people. Many linked this to the overall business. Many discussions took place about the mission, values and goals of the company as seen, for example, in the next comment:

“What kind of metrics am I talking about? Proof of employee understanding of critical company values, such that they are living the values in their daily work. Proof of how that can hit the bottom line. (01/09/2011, Editor)”

Many possibilities could also be seen in the increasing amount of data nowadays. Many saw that everything throughout the employees’ lifecycle needs to be measured and this measurement should be ongoing and real time. This supports the idea presented earlier in terms of the annual surveys. However, the increasing measurement, data collection and analysis were also seen to include some challenges concerning privacy and security issues as demonstrated in the next comment:

“As the scope of employee data grows, so will concerns about how that data is stored and managed. If possible, assign one person to manage that data and ensure company policy doesn’t infringe on employees’ rights to privacy.” (21/07/2015, Editor)”

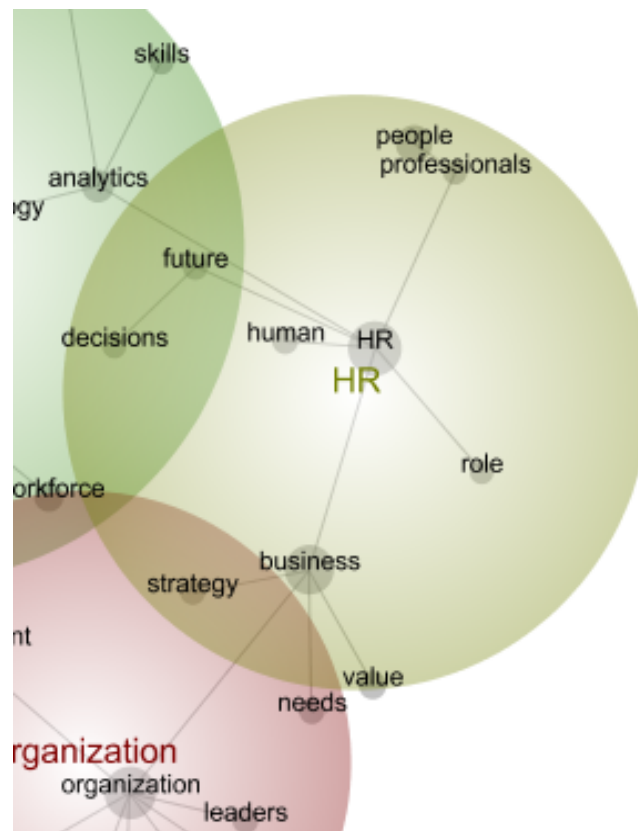
Many discussions took place about the possibilities that the HR analytics and big data have to offer. The data was seen as a possibility to drive successful companies and result to positive business outcomes as noted in the next comment:

“Companies amass a tremendous amount of data about their people whether data on candidate sourcing channels, general demographic information like age and gender...By analysing this information in real time, a company can directly improve critical HR functions and ultimately link those results to desired business outcomes” (23/12/2014, Editor)”

4.1.3. Theme “HR”

The third theme on the concept map is the “HR” with the connectivity of 89%. The snapshot of the overall concept map can be seen in Figure 22.

Figure 22. Snapshot of the theme “HR”



The concepts linked to this theme are “HR”, “business”, “people”, “value”, “human”, “future”, “role” and “professionals”. Two of these concepts stood out as the major concepts of the whole theme. These were the “HR” and the “business”, which are now examined more closely.

“Not staying in their sandbox anymore”

The first major topic of discussion under the concept HR was an understanding that change is needed. The traditional HR was seen to focus more on the HR itself, serving people and improving the HR services and practices and this was not seen to function anymore. As one comment stated, HR is the “fluffy, tea and tissues function”. Many saw that HR is now on the edge of a change and much discussion took place regarding the role of HR in the future and what this means for HR professionals. The next comment sums up these discussions:

“HR must shift from being a processing department to being a strategy provider. Take these steps for an HR strategy that increases HR value and directly contributes to the success of the company s overall goals.” (17/01/2013, Editor)

Many saw that the future would bring a new business-oriented HR, which could be challenging at least partly to some HR professionals. Some thought that the HR professionals would not be comfortable with the more data-focused HR. It was also seen that the technology and analytics could help HR to do this transformation and it was discussed that the new HR would be more a decision-focused function like seen in the next statement:

“HR technology and analytics is helping to transform HR into a decision science with a measurable impact on business.” (27/10/2011, Editor)

Some commented that this would mean more than incorporating only more facts and numbers. HR already has a lot of data, which then leads to the question of “what to do with the data”, although many also commented that new HR analytics start-ups are originating all the time. Many noted that HR needs to become business centric and, in order to do this, it needs the right metrics to back it up. This topic is more carefully examined in the next paragraph.

“On the pulse of the organisation”

As seen already in the previous paragraph, the focus in these discussions was directed strongly at the measurement of HRM. Metrics were seen as a way to prove the value of HR, but the question came up multiple times: what should be measured and how? It was noted that there are already a lot of data and it is increasing all the time and maybe the right answer is not to only increase the amount of metrics, but to focus more on their quality, i.e. how can HR show its value to the business as noted in the next comment:

“Gathering data on people management processes does little good unless you use it to ask the right questions and solve the right problems. Big data is the latest buzzword entering the HR lexicon.” (12/02/2013, Editor)

Big data and HR analytics were once again proposed as a possible enabler of this. HR analytics was thought of as an enabler for more fact-based decision-making, which takes the guessing and gut feeling of the HR decision-making. It was compared to finance and engineering. However, it was noted that many are in the beginning in the analytics journey as described in the next comment:

“It’s early days. The HR departments already using BI are in the minority, making it now an ideal time to beat competitors by taking full advantage of one of the most fascinating developments in data-driven analysis for decades.” (06/03/2013, Editor)

The technological developments have also placed demands on HR professionals. Many believe HR needs to acquire and ensure analytical skills, and this should be taken into account already when recruiting new HR professionals.

“Business-centric HR”

The second major concept on the theme HR is the business, which focuses on the topic already touched on in the previous section. It is named “business-centric HR” in which the focus of HR is seen to move from the people to the overall business. In these discussions, HR was seen in a business partner role in the future and HR analytics was seen as the possible link between HR and the business as remarked in the next statement:

“I am having more and more conversations recently about the need for integration within HR and outside HR with the business and other functions and it strikes me that the use of HR analytics might be an important vehicle for achieving this.” (13/03/2015, Editor)

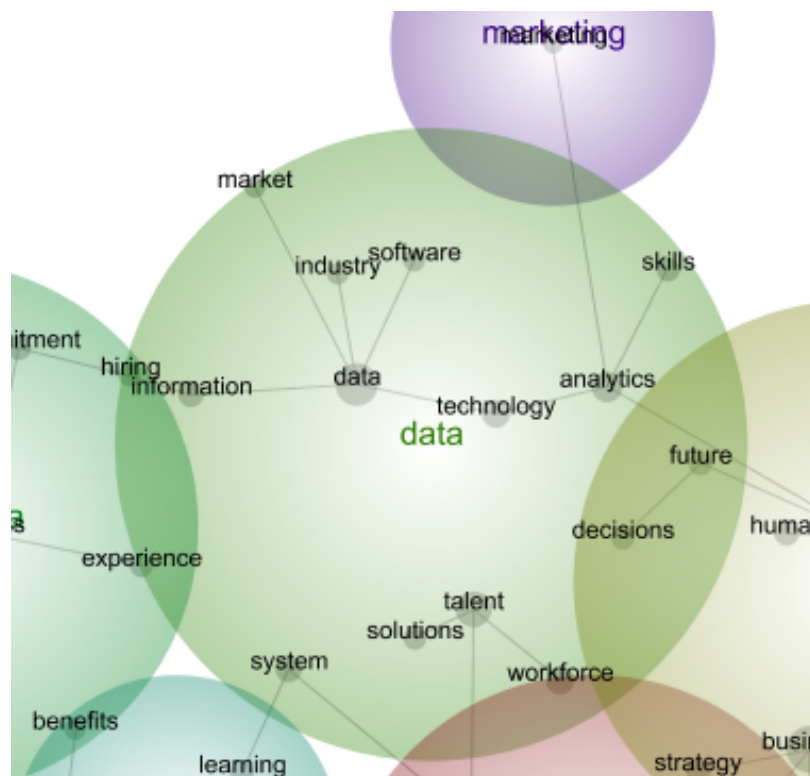
Many thought that, through analytics, data from different sources can be utilised and data silos can be dissembled. Still, many comments stated that the focus should be on the questions and decisions instead of the data and the tools i.e. analytics. This means that HR should start with the critical business questions or the decisions. It was noted that there is no “one-size-fits-all” solution in HR analytics and the worry remains as to the HR readiness for this transition as the next comment illustrates:

“Just like the hottest fashion, the latest technology or the coolest song, Metrics and Analytics has risen to the top of the charts and is the hottest topic of the day. However, the question is this: Is HR adequately prepared for the Metrics and Analytics wave?” (25/12/2014, Editor)

4.1.4. Theme “data”

The fourth theme of the concept map is the “data” with the connectivity of 88%, which can be seen in the snapshot of the overall concept map in Figure 23.

Figure 23. Snapshot of the theme “data”



The concepts linked to this theme are “data”, “talent”, “analytics”, “technology”, “system”, “information”, “skills”, “decisions”, “solutions”, “software”, “industry” and “market”. The major concepts of these are the “data”, “analytics” and “talent” that are now examined more closely. The concept data can be divided into data and big data, which are both now examined separately.

“Bringing data to life”

In the discussions, it was noted that the HR departments have a lot of data but they are still wondering what they should do with it. A common understanding was that collecting data is not enough and it does not matter how well it is organised and presented, but it is useless unless it is used to answer the right questions and solve the right problems. Many also commented that when thinking about these issues, special focus should be directed at how the data is presented i.e. what is the story behind the data. In addition, many highlighted the meaning of context when using the data. The story the data tells is depended on the context in which the data is collected. According to the HR professionals, the data encases plenty of possibilities, which have not been always understood as the next comment illustrates:

“HR has been slow to understand the value of data, but as the shift from administrative support to strategic leadership continues, data has become more and more crucial as a lever of competitive advantage.” (03/03/2015, Editor)

“Buzz of big data”

The main focus on the discussions related to data was nevertheless on big data, which was seen as the new “buzzword” in HRM. It was seen as the possible revolutionary of the field of HR, although it was also noted that it could also stay as a buzz until it is understood what it enables HR to do as the next comment illustrates:

“Big data is naturally complex, and certain algorithm factors are often beyond our grasp. For example, Google is capable of predicting flu patterns based on search habits and user information.” (10/09/2013, Editor)

In many comments, big data was seen to provide insights into employees' work habits, which functions as a basis for better decision-making. However, as already noted in the previous section about the data, many commented that more data does not directly mean right data or right insights, which can be seen for example in the next comment:

“So, big numbers don't always make for big data or big intelligence. Statistical significance is not the same as importance.” (03/07/2014, Editor)

Many commented also that the benefit of big data is on the disassembly of the data silos. Big data has the potential to combine different kinds of data from different sources to provide insights for the bases of better decisions. Some also commented that there are already companies that can collect data, for example, about employees' incomes, interest, sexual preference, and medical history. This development was not seen as only positive. Some referred big data as the “big brother” watching over employees' every move.

“In the beginning of their analytics journey”

One major topic of discussion concerning HR analytics was about its definition. It was noted that the concepts of “analytics”, “metrics”, “benchmarking” and “reporting” are often used in discussions to refer to the same issues. Many commented that analytics is not about metrics or reporting, but it studies the data to identify and present trends and patterns as well as builds “roadmaps” for decision-making on it as the next statement illustrates:

“In other words, analytics is more than having data, or even insight from that data. Analytics sums up a journey, using data to drive action and improve decision making.” (08/10/2014, Editor)

One comment used a metaphor that metrics are a snapshot when analytics again shows the trends over time. Still, many saw that HR often only concentrates on collecting data and metrics, which are then shown to management without any further analyses instead of first pondering the questions that need to be answered. These might illustrate the early maturity stage of HR analytics in HR departments. Many commented that there

have been studies which have shown that only about 15% of HR teams are using HR analytics and that many predictions have been made that HR analytics is the next big thing in HR, which clearly have not converted into reality. The following comment provides a good example of this:

“Our firm is often asked if we can explore the data in the HR systems to see if we can find anything useful. We recommend avoiding this approach as it is exactly the same as beginning to read Wikipedia from the beginning (like a book) hoping to find something useful.” (29/10/2015, Editor)

A lot of discussion on analytics focused on the predictive analytics, which were described as a tool to analyse past and current data to reveal patterns and trends and accurately predict the future to support decision-making and identifying new opportunities. Many examples were made, which mostly focused on reducing attrition and improving quality of hire. One comment was also related to predicting scheduling, which takes into account the high and low periods in staffing and few comments about the link between HR data and business performance, for example employee survey data and customer satisfactions and profit margin. No comments were made about the prescriptive analytics. Still, there were comments about the human side of things like the next comment illustrates:

“On the other hand, sceptics argue that you cannot learn about people and their abilities by looking at statistics. Whichever side you’re on, one thing is certain: the HR world is changing and those who fail to get on board with big data will ultimately be left behind.” (30/07/2014, Editor)

Some commented that although the technology is developing and enabling the use of new tools, “even the best algorithms require a human touch”.

“The war on talent”

Talent management was seen as a key focus when considering the utilisation of HR analytics. It was seen as the critical factor in achieving competitive edge and the rapidly changing business environment leads to, as one comment stated, the “need to hire top

talent at the speed of light”. The one who manages the HR analytics could win “the war on talent”. As stated in the previous section, in talent management many also commented that organisations are still in the early stages in the analytics as seen in the next statement:

“Yet the potential of analytics, in power recruiting and hiring, in particular, is still in its infancy. Getting down to true talent analytics Consider this: Many companies are still just trying to get their data house in order to have a single source of truth that better informs their metrics and reporting.” (23/12/2014, Editor)

Talent analytics was seen as a tool to identify potential talent outside and inside the companies. The key was seen in identifying the strategic talent requirements based on the business needs. This functions as a basis for the recruitment, development and keeping of the strategic talents. Still, again, a lot of discussion focused on the metrics, for example “what are the metric that measures the time taken from indent to hire”. The discussions about analytics concentrated mostly on recruitment and minimising the turnover, which could be seen foremost monetary issue and not so much with the strategic focus. Also the example of the time taken to hire was in some comments talked with the HR analytics as it was seen that the analytics could function as a tool for minimise the time to hire by using analytics to process the job applications as seen in the example comment:

“Because of this, companies are using algorithms to mine large amounts of data and locate hidden candidates that possess untapped talent.” (10/09/2013, Editor)

Analytics was not perceived as only minimising the time to hire but also to identify the best talents inside and outside the organisations and their shared attributes. Talent management was something that should be managed throughout the employees’ career, from their recruitment to exiting. Analytics was a potential leverage to achieve a competitive advantage as seen in the next statement:

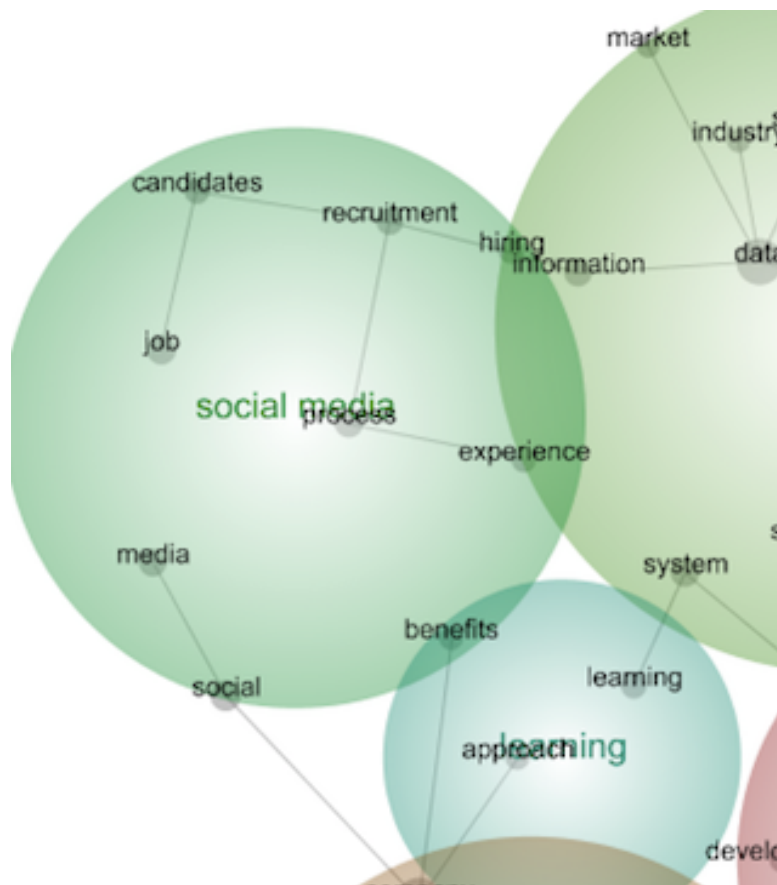
“The ‘talent war’ for the most skilled employees is likely to escalate even further during 2015. Big data and analytics have begun to play an important (and expanding) role in recruiting.” (07/04/2015, Editor)

However, these expectations have materialised and many HR professionals were still hesitant about what the future will bring.

4.1.5. Theme “social media”

The last of the major themes of the concept map is the “social media” with the connectivity of 46%, which can be seen in the snapshot of the overall concept map in Figure 24.

Figure 24. Snapshot of the theme “social media”



The concepts linked to this theme are “social”, “job”, “process”, “media”, “recruitment”, “hiring”, “candidates” and “experience”. In this section, we examine

more closely the most prominent topic of discussion in this theme concerning HR analytics, which are the possibilities of social media in recruitment.

“Social recruiting”

The most prominent topic of discussion in the theme social media can be labelled social recruiting, which refers to using social platforms, such as talent databases. Rather than using traditional CVs and interviews, many are now focusing on measuring candidates on the basis of their social media profiles and using automated applicant-tracking systems. All in all, recruitment was seen as a good and maybe also easier way to start when taking the first steps with analytics. Many commented that the marketing is already utilising many ways of analytics and now it is HR’s turn. HR also has the ability to learn a lot from, for example, marketing. Social media was seen to offer wider opportunities for implementing HR analytics. Social media could be used to identify applicants’ patterns of Internet use and their ways of responding to online choices. This data can then be used to assess the applicant’s fit in the workplace. One example of this is shown in the following comment:

“Klout is described (by Wikipedia) as a San Francisco-based company that provides social media analytics to measure a user’s influence across his or her social network. The analysis is done on data taken from sites such as Twitter, Facebook, and Google+, and measures the size of a person’s network, the content created, and purports to measure how other people interact with that content.” (08/03/2013, Editor)

4.2. “Analytics” concept analysis

In this section, the concept “analytics” is examined more closely. The reason why it is referred to here as “analytics” instead of “HR analytics” is because the Leximancer identifies all of the blog posts where the concept “analytics” is used regardless of the precise term. This means that we can take into account all of the different concepts that more or less refer to the same area of interest, for example “workforce analytics”, “people analytics”, “HR analytics” or “talent analytics”. Since the use of the term “HR

analytics” is not yet fully established, it may be more useful to take a broader definition encompassing these different terms.

First the co-occurrence analysis is presented, which enables to identify the most prominent concepts that are connected to the concept “analytics”. After this, we will furthermore separately examine the possible connection between analytics and the concept of data-driven HRM. The most prominent concepts linked to the concept of “analytics” can be seen in Table 15, which also shows in how many blog posts the concept is mentioned at the same time as the concept “analytics” and what its relevance is.

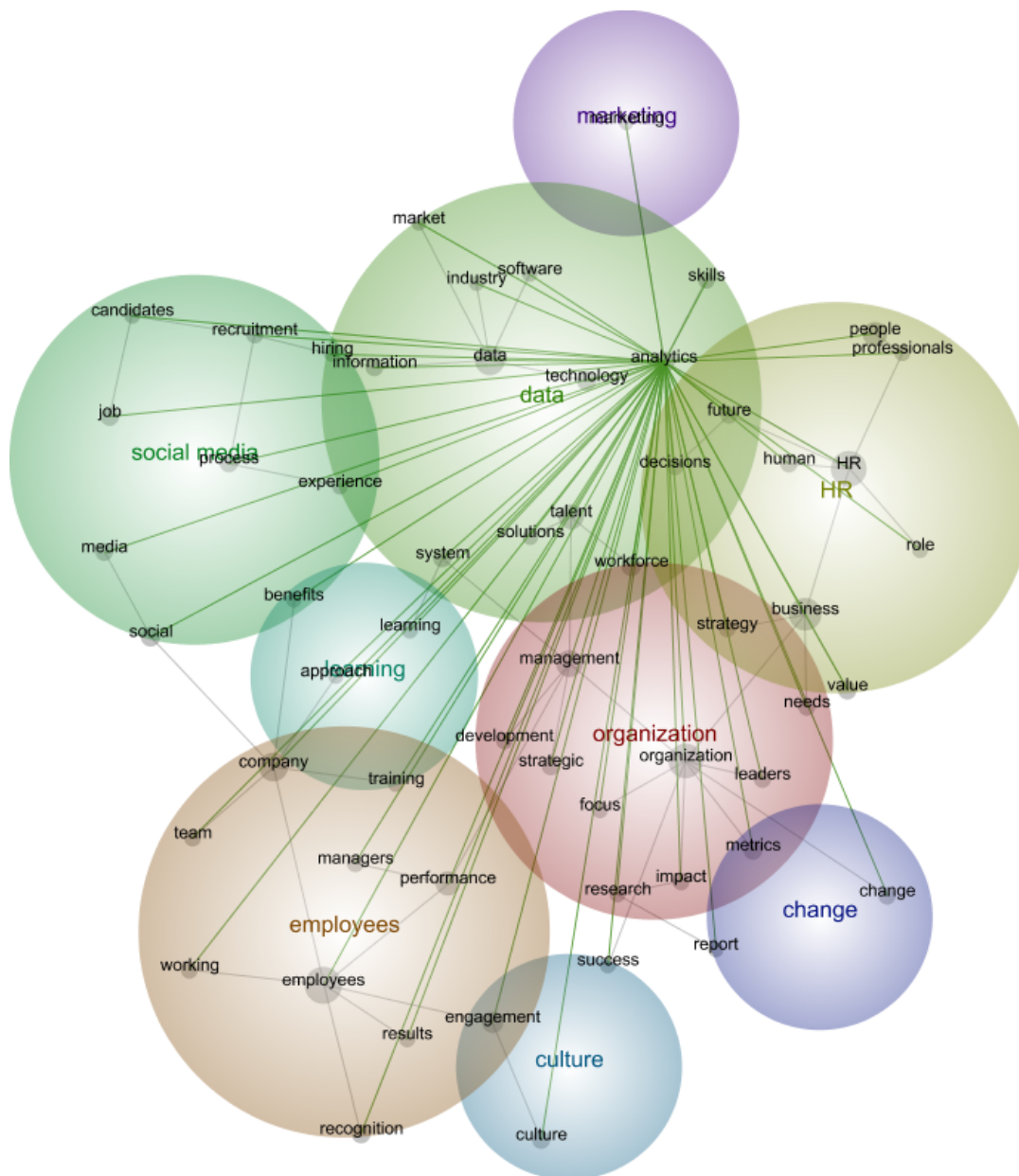
Table 15: Most prominent concepts linked to concept “analytics”

Concept	Count	Relevance
workforce	66	21 %
data	169	17 %
industry	24	14 %
HR	174	13 %
technology	51	13 %
strategic	34	13 %
learning	23	11 %
talent	71	11 %
future	27	11 %
business	107	11 %

Figure 25 below displays the co-occurrences visually and shows how the concept of “analytics” is connected to other concepts in the concept map. The most prominent concepts linked to the concept “analytics” are “workforce”, “data”, “industry”, “HR” and “technology”. The results obtained in this part of the analysis mostly support the results concluded already in the previous conceptual analysis. Also some new insights were made, which are examined more closely next.

The concepts workforce and HR were understandably very high on the list, because analytics in HR is often referred as HR analytics or workforce analytics. Also another reason is that analytics in this context focuses on HR and workforce. The concept data again was a major topic of multiple discussions related to analytics. Many of these topics were already examined in the previous part of this chapter.

Figure 25. Co-occurrence map of the concept “analytics”



As already noted, HR has a lot of data, but often not a clear understanding of how to use it. HR also uses a lot of metrics, but they primarily measure a particular moment, as HR analytics was again seen as a way to discover patterns and trends as well as predict the future. Metrics was seen to focus on the past and HR analytics on the future. In this way, it was seen that it is not only about the data, but the insights from that data. As many noted, more data is not necessarily right data and data itself does not provide the right insights. The following statement illustrates these discussions:

“Note that I’m using reporting here to refer to all the work that goes into collecting, standardising and publishing data against specified metrics which is a lot harder than it sounds. Analytics is what happens when you add actual analysis to the mix, and are able to start making predictions and prescriptions based on it.” (25/12/2014, Editor)

Many commented that HR analytics should start with the business. It was seen that good business is based on statistical evidence and data analytics. Changes, challenges and needs of the industry as well as the way analytics is often used in that industry was seen to form the basis from which to start. Many saw that different industries might also offer new insights for HR analytics for example marketing or credit industry as seen in the next comment:

“A great example is to consider the credit industry. Imagine them extending credit to someone for a mortgage and then applying analytics after the mortgage has been extended to predict which mortgage holders are a good credit risk.” (29/10/2015, Editor)

Technology was seen to play a critical role in HR analytics. It brings together large volumes of information from different sources as well as offers forecasts that would have not been possible before. New developed HR technology was described as proactive, easy to use, mobile and automated. Many also commented that organisations are also investing now more in HR technology than before, but before these investments are made, HR professionals need to understand “when, why and how” the HR technology is needed. It was also noted that new start-ups are emerging continuously, which are developing new tools and algorithms for HR analytics as seen in the following comment:

“One start-up, for example, uses predictive modelling based prior companies culture, current role, manager style, etc. to determine culture fit and success on a new job an evolution on assessments.” (10/07/2013, Editor)

In addition to identifying the most prominent concepts linked to “analytics”, it was also examined how the possible connection between analytics and data-driven HRM appears

in the discussion of HR professionals. This analysis was made with the query-tool of Leximancer, which enables to examine the possible connections between different concepts. When entering the concepts to the query Leximancer identifies the blog posts in which these different concepts are used in the same context and this way it enables to examine their meaning in more detail. With the query, the possible connection between the concepts “analytics” and “data-driven”, “evidence-based”, “decision-making” and “measuring” was examined to form a more comprehensive picture of how HR professionals perceive the concept of HR analytics and data-driven HRM. Addition to the concept “measuring”, also concepts “measurement” and “metrics” were applied. All of these concepts were selected on the basis of the literature review, because these were the concepts that were mostly used when referring to data-driven HRM. Altogether 70 different blog posts were found in this phase. Most blog posts (60 posts) were found with the concepts referring to measuring and decision-making. These posts were found from years between 2010 and 2015. “Evidence-based” and “data-driven” again produced less blog results (10 posts), which indicates that the use of these concepts is not yet very established. However the results that were found, were exclusively from the year 2015. This might indicate that although these concepts are not currently very widely used by the HR professionals, their use is increasing gradually.

The findings in this part of the analysis also support the findings made in the previous sections. In this section, the findings presented already previously are not repeated, but rather focus more on the new insights. This next statement of one HR professional is used as a start:

“People analytics is slowly transforming the way that we hire, develop, and promote or separate our workforce in a data-driven and evidence-based way. The organisations paving the way tend to be early adopters, innovators and disrupters like Google.” (09/02/2015, Editor).

This comment as well as many other discussions among the HR professionals reinforces the understanding that HR is still in the early stages of HR analytics adoption. HR professionals saw the potential of HR analytics, but do not quite yet understand all of the ways that it can be utilised in practice. Many did, however, note that the

organisations that are already data-driven have the best possibilities to gain a competitive advantage also through HR analytics. This means that the organisations that already base their managerial decisions on evidence and data instead of beliefs, opinions, gut instinct, intuition or human biases are likely to also embrace these practices more easily in HRM. On the other hand, those organisations that have not done so already are facing a larger cultural change. Analytics was seen as a possibility to bring HR closer to the business as seen in the next statement:

“Businesses run on numbers and bottom lines, and HR will need to understand how to use analytics to show the value of their decisions and the ROI.”
(10/03/2014, Editor)

Analytics was seen as a way to help decision-making, map directions and shape outcomes. It was also seen as a way to make sure that the decisions about employee selection and development were based on criteria that were correlated statistically with business outcomes. Some HR professionals saw that the critical thing in adopting HR analytics was the need for a new mindset; others need to embrace new technology. Some referred to the technological developments as the SMAC (social, mobile, analytics and cloud) in which these four together are accelerating the technological developments. This offers new possibilities, but also challenges as seen in the following statement:

“This SMAC technology is all well and good in theory, but putting it into practice is where the challenge lies. Business heads will need to decide which combination of solutions and tools will work best for their organisation.”
(17/07/2013, Editor)

This means that the need for new kinds of experts is also increasing. HR professionals saw that people with multiple capabilities are needed, i.e. people who are experts in data storage and processing, creating tools that advance collaboration as well as data-driven decision-making. Still, it was noted that this does not mean that everyone in HR needs to become analytics experts, but different roles are also needed in the future. A common

understanding was that although HR analytics will increase in the future, it would not replace human judgement entirely.

4.3. Summary of the analysis

The objective of this chapter was to present the results of the empirical analysis made on the basis of the discussion of HR professionals about HR analytics and to identify the possible connections to data-driven HRM. This was done by identifying the meanings HR professionals give to HR analytics in blogs in selected online communities.

In this part of the thesis, I present a summary of the empirical analysis and findings. Table 16 below displays an overall summary of the most prominent themes and topics of the discussions as well as the main points of the discussions. In addition, a more comprehensive summary of the analysis can be found in Appendix A.

Table 16. Summary of the discussion of HR professionals

Theme	Topics of discussion	Main point of discussion
Organisation	“Seat at the table”	HR is lacking the attention of the board. How can HR bring value to business? HR analytics might help, but not a clear understanding of it.
	“The bottom line”	Influence on the business instead of just HR itself If analytics is used focus often in monetary issues
	“Moving from guessing to knowing”	Focus on the results instead of metrics Is HR ready for HR analytics?
Employees	“The black box of engagement”	How can engagement be measured in practice? Universal or customised practice?
	“Traditional annual review has had its day”	Annual review are not working anymore Measuring should be on-going and real time Combining data from different sources
	“Good data or bad data?”	Finding the link between people and business Privacy and security issues
HR	“Not staying in their sandbox anymore”	HR needs to change and become more decision-focused. Can HR analytics help in this transformation? Maybe challenging for HR professionals?
	“On the pulse of the organisation”	A lot of data, but what should be measured? Analytics possibility, but still in infancy in HR

	“Business-centric HR”	Connecting to the HR to the wider business environment No one-size-fits all solutions
Data	“Bringing data to life”	Data should answer questions and solve problems Possible source of competitive advantage? Context of data
	“Buzz of big data”	What does this mean in practice? Big data or big brother?
	“In the beginning of their analytics journey”	Difference between different concepts, the use of overlapping terms. Now focus often on collecting data and metrics without further analyses Focus on predictive analytics
	“The war on talent”	Critical factor in organisations, analytics could help to win “the war on talent”; will it realise in practice? Analytics has tools to identify potential talent inside and outside companies
Social media	“Social recruiting”	Good place to start the analytics journey Offers a lot of opportunities for HR analytics

The discussion in the different themes focused on topics that were closely linked to each other. Overall, a few major topics of discussion were prominent. First, the overall role of HRM highlighted many of the discussions and debates. HR was argued to still lack the attention of the board, which according to the HR professionals derived mainly from the lack of focus on the business. HR professionals saw that more attention should be focused on how HR could bring value to the overall business, because traditionally the focus of HR has been more on HR itself. HR analytics was argued to be a possible way to make this happen in practice by enabling better insights and decision-making. HR analytics was described as a tool for analysing current and past data, revealing patterns and trends, as well as predicting the future. Many HR professionals understood it as a possible way to add value and bring a competitive advantage to the business. Still, the ways that HR analytics is used currently mostly focus on monetary issues and cost optimising.

Another focal point of the discussion was about metrics and measuring in HRM. One major question was should there be universal or customised metrics. There was not a

clear uniform opinion on the matter. The discussion also focused on the fact that the traditional annual reviews and surveys are not working anymore. Instead most of the HR professionals saw that measuring should be ongoing and real time. It was also noted that HR has a lot of data, which could be used more effectively to bring value to the business. Many comments addressed the fact that data cannot be dealt with in silos anymore. HR analytics and big data were seen as possible ways to make this happen. They could connect HR to the broader business context by combining data from different sources inside and outside the HR. Also mobile devices and apps were seen as possible new tools for HR as they had been used already successfully with sales and marketing. According to many HR professionals, the utilisation of HR analytics should also be extended to the entire lifecycle of employees.

Big data was seen as a big trend in HR, but it is still not certain as to what it means for the future of HR. At least the possibilities related to social media were recognised. Many saw that social media was a good place to start the HR analytics journey, because of the large amount of data available and many new start-ups offering novel tools. One big question was also the privacy and security issues. Big data was referred as the “big brother who is always watching employees’ every move”, which raised the question of whether this is ethical and how can organisations make sure that the data is protected.

The general perception among the HR professionals was that HR is in the early maturity stages of HR analytics and currently the focus of HR is more on the collecting data and producing metrics without any further analyses. Many noted that analytics is not about metrics or reporting but it goes deeper, identifies trends and patterns and builds roadmaps as a basis for decision-making. Many saw that HR needs to become more decision-focused function, which might function better as a part of some other function, maybe financing. Hence the term data-driven or evidence-based HRM still was not very widely used among HR professionals. All of the blog posts linking analytics and data-driven or evidence-based HRM were found from the year 2015, which could indicate that these terms are only generalising. Again terms related to measuring and decision-making were used throughout the observation years.

In addition to the right mindset, the focus needs to also be directed to the technology, which is in a central role in making the transition to more data-driven HRM. This places many demands on the HR professionals who need to adopt a lot of new capabilities, and many comments were questioning the readiness of HR professionals for the HR analytics. It was noted, despite all the technological developments, that there is also room for human judgment in the future.

As a conclusion, it can be noted that no one-size-fits-all kinds of solutions were seen possible, but every organisation needs to begin its analytics journey from its own situation. Many noted that analytics is a tool that can be used to solve problems or answer questions and a special focus on the discussion was directed at the visualisation of the results. However, it was noted that statistical significance is not the same thing as importance. By this, it was meant that it is not enough to use statistical tools; you need to know how to interpret the results and how to utilise them.

5. DISCUSSION

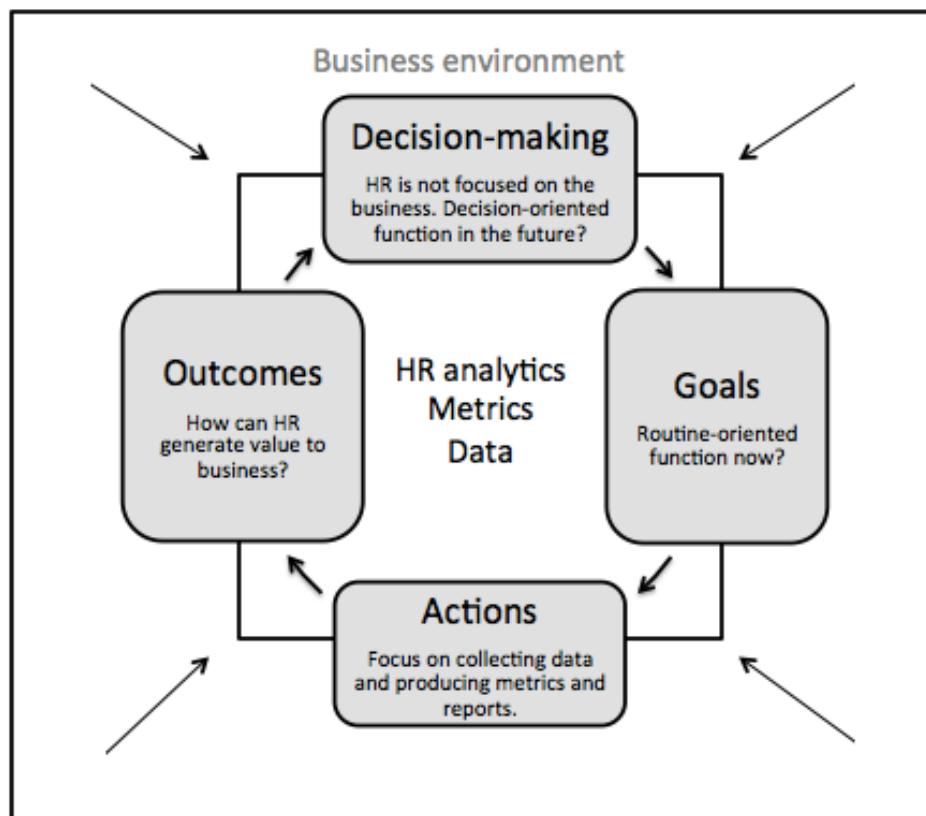
The purpose of this thesis was to deepen the understanding of HR analytics and its implementation. In addition, the possible connections between HR analytics and the measuring and decision-making of HRM were also examined. In this chapter, the empirical findings presented in the previous chapter are reflected against the theoretical framework of this thesis, which is then followed by a discussion of the main results.

As a basis of the literature review, the theoretical framework of this study was presented, which illustrated how the different aspect examined in the literature review together formed the basis for the data-driven HRM. The starting point for the data-driven HRM and the SHRM is the broader business context (Brockbank, 2015; Rasmussen & Ulrich, 2015; Ulrich & Dulebohn). The data-driven HRM again functions as the basis for the circular strategic decision-making processes, and the different levels of data-driven HRM, data, metrics and analytics can be utilised in all of the different phases of the decision-making circle. Hence, they are not valuable in themselves, but rather in how they are used (e.g. Fitz-enz, 2010; Levenson, 2013; Rasmussen & Ulrich, 2015). The right metrics and analytical tools should then be chosen on the basis of the needs and, therefore, they are context-bound (e.g. Fitz-enz, 2010; Beatty, 2015). Because different organisations have different strategies, the analytical tools also need to base on the strategy of the organisation. In all circumstances, it is not always adequate to use the most sophisticated analytical tools, but different decision-making levels require different tools and also a different amount of human judgement. It was concluded that the development of HR analytics has enabled the use of novel and more sophisticated tools. This means that also more complex, predictive and prescriptive analyses can be made that combine data from different external and internal sources as a basis for the decision-making. However, it was concluded that the more complex tools are used, the more it requires capabilities from the people who are utilising them. Even the most sophisticated tools need also human judgement.

The theoretical frame is now reflected with the empirical findings of the previous chapter. The key points of this reflection are illustrated in Figure 26. The empirical

findings state that HR is still its infancy on the data-driven HRM journey, which was supported by the outcome that the term data-driven HRM (or evidence-based HRM) were still not very widely used among HR professionals. The overview of HR professionals was that HR as a function is still not sufficiently business focused. Instead it was concluded that HR is still very routine-oriented. This means that the focus of HR is strongly on traditional HR processes and metrics for example data collecting and annual reviews and surveys. Many concluded that HR collects data and metrics without any further analyses and produces reports that “no one reads”. Hence it was concluded that HR needs a better understanding of the business needs and how HR can bring value to the business.

Figure 26. Data-driven HRM

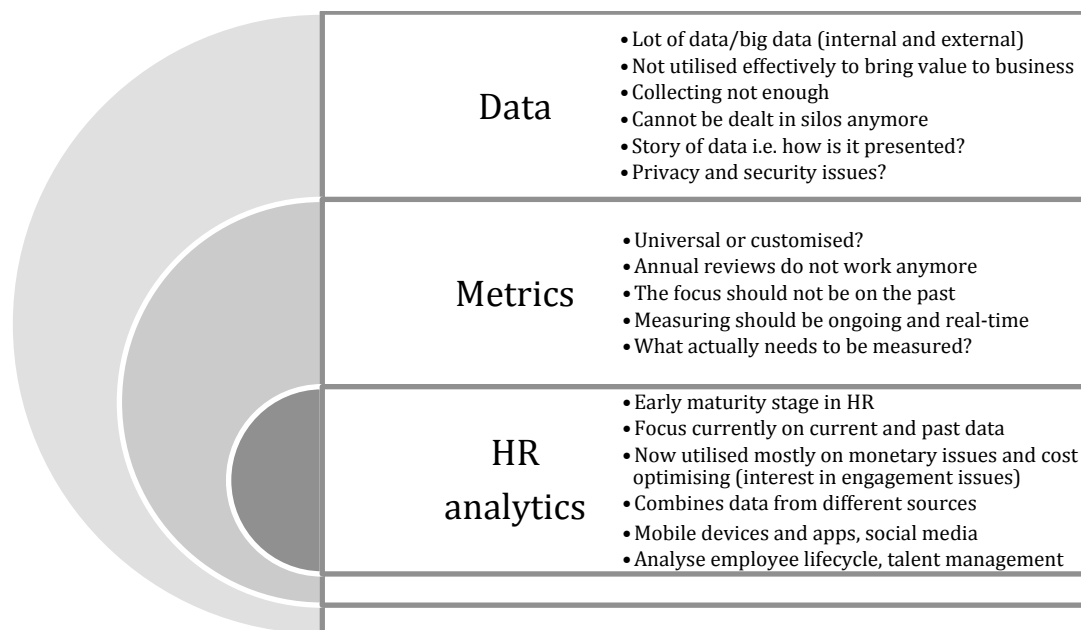


Many HR professionals argued that HR needs to become a decision-oriented function, which supports the framework of Boudreau & Ramstad (2007) related to the Talentship –decision science. HR analytics were proposed as a possible way to help in this transformation. Still it can be questioned that what is the real understanding of HR

professionals concerning HR analytics. Many argued that HR analytics would enable better insights and decisions and help HR to become more business-oriented. Still first HR professionals need to understand for what and how HR analytics can be utilised in practice. The discussions of HR professionals can be concluded by stating that HR professionals feel that HR analytics has “a lot to offer”, but they do not have clear understanding what the different tools of HR analytics are in practice and how they can be used and for what.

The main points of the discussions of HR professionals related to the practical issues concerning HR analytics, metrics and data are presented as a summary in Figure 27. These are mostly issues that are already presented in the previous chapter, but here are few key observations to complement the outlook of the previous paragraph. The discussions related to the actual implementation of HR analytics on practical level were to some extent limited and focused mainly on monetary issues for example how different HR practices can be produced more cost-effectively or different ways that money can be save. This supports the outlook of Walsh et al. (2010) that human capital is often treated as expense instead of asset and the decisions concerning HRM are made on the basis of minimising the costs.

Figure 27. Summary of the HR professionals’ perceptions



However it should be also noted that the few insights on how HR analytics could possibly be utilised in the future were related to talent management and employee engagement. Especially in the talent management HR analytics was proposed as possible way that could help to win “the war on talent”. Analytics could for example help to identify talent inside and outside of companies, minimise turnover and the time to hire as well as identify the attributes of the best talents. Employee engagement was proposed as another target for HR analytics. However related to this, there was not a clear understanding of how it could be measured, analysed and therefore managed in practice. As a conclusion it can be stated that the overall focus of HR analytics implementation in the discussions of HR professionals was still directed mainly on past and current data. As a result the possibilities related to the implementation of predictive and prescriptive analysis were not established.

6. CONCLUSIONS

In this final chapter, the overall study of HR analytics in data driven HRM is concluded. It begins with a research summary where the purpose of this study and the research questions are restated, which is followed by a brief summary of the empirical findings. After that the major theoretical contributions of this thesis are presented and then this chapter and the overall thesis is concluded with the managerial implications, limitations and suggestions for further study.

6.1. Research summary

The purpose of this thesis was to deepen the understanding of HR analytics and its implementation. In addition, the possible connections between HR analytics and the measuring and decision-making of HRM were also examined. This was done in order to understand if and how HR analytics are connected to the broader concept of data-driven HRM. The main research question was the following:

- *How do HR professionals in online HR communities perceive HR analytics?*

This research question was addressed by the following sub-questions, which also guided the theoretical literature and empirical part of the thesis:

- *How do HR professionals utilise HR analytics?*
- *Do HR professionals perceive that HR analytics affect the measuring and decision-making processes of HRM and, if so, how?*

The literature review was divided into three main sections. The first part described the overall evolution of HR towards more strategic role, which functioned as background for the later parts of the literature review. The evolution of HR as well as the technological development has had a major effect on the data-driven HRM as well as the actual HR analytics (e.g. Boudreau & Ramstad, 2004; Bassi, 2011; Lawler et al., 2014). On the other hand they have provided novel opportunities, but also major pressure for development. The second and the third parts of the literature review focused on the data-driven HRM and the HR analytics. The data-driven HRM was

examined with its different levels that are (1) data, (2) measuring and metrics and (3) the decision-making of HRM. It was concluded that the technological development has also enabled and created novel analytical tools for HRM and therefore the last part of the literature review focused on HR analytics. As a conclusion of the literature review the theoretical frame of data-driven HRM was formed, which illustrates how the different aspects examined in the literature review together form the basis for the data-driven HRM.

Related to the methodology, the research of this thesis was based on data that was collected from blogs of HR professionals on the major online HR communities in the US and Europe. The data was collected on the basis of predefined keywords that were chosen on the basis of the research questions and the preliminary familiarisation related to the academic literature. The first phase of the data analysis was made with the Leximancer software that provided thematic and semantic analysis of the data. The second phase of the data analysis again was made by the researcher with qualitative methods.

6.2. Theoretical contribution

This thesis contributes new insights related to the implementation of HR analytics and provides a more complete overview on the concept of data-driven HRM based on the perceptions of HR professionals in global online communities.

The empirical findings confirm what was already concluded in the literature review: HR is still its infancy in data-driven HRM. Hence the use of the term data-driven HRM (or evidence-based HRM) is still not established among HR professionals. HR as a function is very routine-oriented and the focus is strongly on the traditional HR processes and metrics, which often are universal in their nature. HR collects data and metrics, and often produces reports without further analyses. As a conclusion it was argued that if HR wants to achieve the role of strategic business partner, it needs to become more decision-oriented and develop a better understanding of business and start to make decisions based on how HR can bring value to the business.

The theoretical framework of this thesis proposes that the decision-making of HRM is an on-going process in which the data-driven HRM functions as a basis for this circular decision-making processes. Hence the HR analytics, metrics and data function as a “toolset” that can be utilised when necessary in the different parts of the process. Therefore these data-driven tools are context-bound and need to be designed and used accordingly. The findings of this thesis conclude that HR professionals understand the possibilities of HR analytics, but still do not have clear understanding what the different tools of HR analytics are in practice and how they can be used and for what. However the HR professionals perceive that the analytical tools need to be based on the business needs and strategy if HR wants to achieve a more strategic role.

Related to the actual implementation of HR analytics on practical level, the findings suggest that the focus of HR professionals is currently directed mainly on monetary issues, which also indicates that the data-driven HRM is not yet connected to strategic issues. Still HR professionals were interested in its possibilities related to talent management and employee engagement.

The theoretical background concluded that HR analytics offer many novel and sophisticated tools for data-driven HRM, but its successful implementation is depended on the capabilities of the people that are utilising them, their ability to understand these tools and knowing what tools to use and when. The demand for human judgement places a major responsibility for HR professionals. Hence their role in the implementation of data-driven HRM is critical.

6.3. Managerial implications

The aim of this thesis was to deepen the understanding of HR analytics and the broader concept of data-driven HRM. Because of the prior research on HR analytics have been quite limited, this thesis provided new insights on the implementation and role of HR analytics and data-driven HRM in organisations. As an outcome of this thesis, it was concluded that data, metrics and HR analytics could be addressed as “the context-bound tools of data-driven HRM”. Hence their successful implementation is strongly connected to the context that they are used and to the people using them.

HR analytics and the overall data-driven HRM is still in its infancy in organisations. HR professionals perceive the many possibilities of HR analytics, but they (1) do not have a clear understanding what the different tools of HR analytics are in practice, (2) do not know how they can be used and (3) for what purposes.

Because it was concluded in this thesis that HR professionals are in key role when he practical implications related to this study focus on HR professionals' role on the implementation of data-driven HRM. A summary of the managerial implications for HR professionals is presented in Table 17.

Table 17. Managerial implications

Critical factors for data-driven HR professionals	Description
Active role	The possibilities related to HR analytics and data-driven HRM can only actualise if HR professionals embrace an active role.
Business interest	HR professionals need to become enablers that connect different people, functions and business environment. They need to develop a genuine interest in the business.
Technology friendly	Technological development is accelerating and HR professionals no longer afford to be bystanders.
Context-bound tools	HR professionals can no longer hide behind standard routines and “be set in their own ways” of doing things.

The practical implications of this thesis are divided into four different factors and identified as the critical factors for the data-driven HR professionals. Related to the findings HR professionals have the key role in the implementation of data-driven HRM. Data-driven HRM enables HR to pursue more strategic role, but in order to make this happen HR professionals need to “take the lead”. This starts by developing a genuine interest in the business. In today's constantly evolving and changing business environment, no one has the privilege to limit their interest only in their own function anymore. In addition HR professionals can function as enablers that disassemble the data silos and bring different people, groups and functions together. This also enables HR

professionals to form a clearer overview of the business and collect data from different sources that are needed for the metrics, analytics and strategic decision-making.

Equally important is the absorbing of new technological skills. In order to be able to utilise different tools of data-driven HRM, HR professionals need to understand how they work. They can no longer avoid the technological side of business, but instead start actively developing their skills of technology related issues in order to understand what are the different data-driven tools and how and when they should be used. Hence HR professionals can no longer hide behind standard routines, pure universal metrics and the old ways of doing things. They need to be able to utilise different data-driven tools including the more sophisticated analytical instruments when needed and applying them based on the context.

6.4. Limitations and suggestions for further research

Despite of the benefits of the research design, in addition there are still some limitations. The first two are related to the data collected for the empirical part of this study. First, the HR professionals studied in this thesis are a limited group of people that are active in the online communities and therefore the empirical data is limited to their perceptions and opinions. This is also reflected in the design of the research question. Second, there are multiple discussions, in addition to HR analytics, on the online communities from which the empirical data was collected. As a result it cannot be concluded on how big of a trend HR analytics is among those other topics. Therefore, it is hard to find out on the bases of this study how critical and current issues HR analytics and data-driven HRM is currently among the HR professionals. The third limitation is related to the data analysis of this thesis. Although the first phase of the data analysis was made with the software Leximancer, still the latter part of the analysis was made by the researcher and as if, it is subjected to the interpretations of the researcher.

Related to the design of this thesis, few possible directions for future research were identified. As noted, the research related to HR analytics is still very limited and more research is still needed. Because the data collected for this study was from limited group of HR professionals that were identified from the major global online blogs, more

research could be focused directly to the HR professionals of different organisations. Hence it could be studied more extensively how organisations are implementing HR analytics. Another interesting possibility would also be to study more of those organisations that are already using more advanced HR analytics i.e. how is its implemented and organised in practice. It would be equally interesting to perceive how those organisations have arranged their HR analytics departments and how it has affected on the competencies of HR professionals.

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APPENDICIES

APPENDIX A: Complete summary of the discussions of HR professionals

Theme	Topics of discussions	Main points of discussions	
Organization	“Seat at the table”	The role of HR important, but lacking the attention of the board.	
		Better understanding of the business needed and how HR can bring value to it.	
		HR analytics can enable better insights and decision-making. Still first understanding to what analytics should be used.	
	“The bottom line”	How HR can influence the business, not just HR itself?	
		If analytics is used, the focus is often in monetary issues.	
	“Moving from guessing to knowing”	Are the best practices optimal? Should more focus be placed on the results than the metrics? Asking right questions? Solving right problems?	
		Is the HR ready for the analytics? Or is it falling behind?	
	Employees	“The black box of engagement”	Engagement seen as important, but in many organizations engagement levels are still low.
			How can it be measured and managed in practice?
Universal or customized metrics?			
Data cannot be dealt in silos anymore.			
“Traditional annual review has had its day”		Annual reviews are not working anymore.	

		Measuring should not focus on the past, it should be ongoing and real-time; more in-depth tools needed.
		Analytics way to link HR to business performance.
		Combining data from different sources, using also mobile devices and apps.
	“Good data or bad data”	Link between people and business; lot of data available, how analytics could utilize all of it?
		Analyzing the employee’s entire lifecycle.
		Privacy and security issues.
HR	”Not staying in their sandbox anymore”	HR needs to change and become more decision-focused function; HR analytics helps in this transformation.
		Maybe challenging for at least some HR professionals?
	“On the pulse of the organization”	Lot of data, but what should be measured?
		Analytics is possibility, but still in infancy in HR.
	“Business-centric HR”	HR should be linked to the wider business environment.
		Analytics helps to dissemble the data silos.
		No-one-size-fits all solutions.
Data	“Bringing data to life”	What to do with all of the data? Collecting data not enough?
		Data should answer questions and solve problems, possible competitive advantage?
		Story of data; how the data

		is presented?
	“Buzz of big data”	Context of data.
	“In the beginning of their analytics journey”	Difference between analytics, metrics, benchmarking and reporting? The use of terms overlapping.
		Analytics not about metrics and reporting, it identifies trends and patterns, builds roadmaps.
		Early maturity stage in HR, now focus often in collecting data and metrics without further analyses.
		Focus on predictive analytics when talking about analytics.
	“The war on talent”	Critical factor in organizations, analytics could help to win “the war on talent”; will it be realized in practice?
		Analytics has tools to identify potential talent inside and outside companies, often focus on recruitment, time to hire and minimizing turnover.
		Analytics could also be used to identify the attributes of the best talents.
Social media	“Social recruiting”	Using social platforms as talent databases.
		Automated applicant-tracking systems, analyzing social media profiles.
		Good place to start the analytics journey.
		Social media offers lot of opportunities for HR analytics.